



Germany 2020

New challenges for a land on expedition

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www.expeditiondeutschland.de/en

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Germany faces historic economic, social and political decisions. To make the right decisions we first need to have consistent pictures of the future. We have therefore set out to sketch what paths of development are conceivable for German business and society in the future based on an innovative scenario analysis – and which picture of the future is the most plausible. The core elements of this “Expedition Germany” scenario are:

In 2020, the “project economy” delivers 15% of value creation in Germany (in 2007 the figure was about 2%). The “project economy” refers to usually temporary, extraordinarily collaborative and often global processes of value creation. It is closely intertwined with the traditional way of doing business and based on mature information technologies. Germany’s small and medium-sized enterprises benefit in particular.

Open innovation processes helped to conquer new markets. In 2020, Germany has caught up with its competitors in markets for cutting-edge technology and knowledge-intensive services. This success is due not least to the sharing and exchanging of secrets – and the close integration of the generation of “sovereign consumers” fostering consumer-generated innovation.

Knowledge is traded on efficient markets in 2020. Data and knowledge markets and partly private, structured learning markets are flourishing, intellectual property has become a commonly used asset class, and intellectual capital has swung into the focus of company valuations.








Government reduces its intervention and there is more co-regulation. **Co-regulation closely integrates** citizens and firms, compelled by fiscal constraints even tighter in 2020 and motivated by legitimization problems. Recipients of social transfers must render community services in return.

A new middle class emerges in German society by 2020, but the lower periphery falls behind. The middle class celebrates its comeback – its members invest in education and benefit from the project economy. Well-educated older people benefit, too: they are intelligently integrated in the working world. By contrast, people with low income have only limited access to private learning markets. They are, young and old alike, often under considerable pressure.

Given the structural changes outlined we expect German GDP to grow at an average rate of 1.5% per year through 2020. From a 2007 perspective these changes pave the way to exceptional opportunities for business, society and policymakers, but also harbour substantial risks. We outline the key fields of action for business – which the winners of 2020 are already addressing today.

** A joint project of all Deutsche Bank Research teams*

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This study is the result – wholly in line with its core thesis – of a temporary cooperation between specialists from different areas. In particular, the authors wish to thank all the teams at Deutsche Bank Research for their close and fruitful cooperation which made this joint project possible. We also wish to thank our interview partners from the business divisions of Deutsche Bank AG and Dr. Burkhard Järisch (Society and Technology Research Group, DaimlerChrysler AG) for their valuable contributions to the project, as well as Alexandra Martini and Henrike Meyer (Martini, Meyer – Büro für Gestaltung) for their fitting and very graphic illustrations.

1. Motivation and approach

Germany faces historic decisions

Social and economic systems are constantly changing. But the pace, breadth and depth of this change varies considerably in the course of a society's evolution. Today, Germany faces landmark decisions to respond to a great many fundamental internal and external changes.

Will German society suffer permanently from its inevitable ageing, or will it be able to cope with the demographic pressures bearing down on the economy and the state's finances? Can Germany redefine its role in the rapidly changing global economy and world order, triggered not least by the emerging power of China and India? Will Germany be a leader or a laggard on the road to the knowledge economy?

The coming years will be crucial years that will decide which path Germany takes long term. This path will lie somewhere between remaining stuck in existing – increasingly inadequate – social and business structures and their rapid, sustained reform.

But where? To try and answer this question we have analysed possible paths on the basis of an extensive and innovative scenario analysis, and have developed four consistent pictures of the future for Germany's economy and society in 2020. These scenarios contribute towards a better understanding of how the various forces interact. An analysis of alternative scenarios of this kind also allows the deduction of implications for political and corporate action today – so that we are able not only to respond more intelligently to structural change but also shape its direction.

But, besides that, we see good reasons for singling out one of the directions we have sketched as being the most plausible. This enables far more concrete conclusions to be drawn about the necessary action. We will focus on a few exemplary implications that have similar relevance for firms in a broad range of sectors – as a blueprint for the development of industry or company-specific strategies.

Foresight by advancing the scenario method

The focus of our scenario analysis is on the actors, structures and processes of Germany's economy in 2020. We also consider political and technological aspects insofar as they have relevant implications for the economy. We have chosen the year 2020 because the time span is long enough for clearly visible structural changes (see box: *Much can change in 13 years*). On the other hand, it is short enough to be able to develop plausible paths to those scenarios.

Consistent methodological extension...

The guiding question for our scenario analysis is: *How has structural change affected the German economy by the year 2020? In order to answer this question, we applied a methodology based on a simple scenario approach: Normally, one identifies the two key drivers to build a "scenario matrix". Each field in the scenario matrix represents a different combination of attributes (high/high, high/low etc.) of these two drivers, and one scenario is developed from each of their respective interactions (see the figure *Scenario matrix*). In addition to these drivers, whose future development is uncertain, there are a number of trend-like drivers – whose future development*

Much can change in 13 years

- Rise of Chindia
- Strong growth in the share of exports in Germany's gross domestic product (from 22% in 1993 to 45% in 2006)
- German reunification
- Growth of the services sector in Germany (share of gross added value in Germany: 1992 65%, 2004 71%)
- Deglomeration of "Germany Inc. – Deutschland AG" (cross-shareholdings among Germany's 100 largest companies reduced in 1996-2000 from 168 to 80)

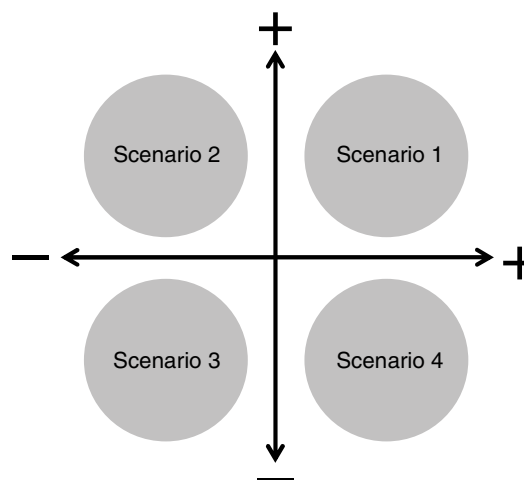
is comparatively predictable (in the following they are referred to for short as “trends”) – which impact on all four scenarios. These trends show similar developments in all four scenarios.^{1, 2}

Elements of our scenario analysis

- “Driver”. Important factor of influence on future structural change in Germany whose future development is *difficult to predict*.
- “Trend” (*trend-like driver*). Important factor of influence on future structural change in Germany whose future development is *reliably predictable*.
- “Dynamic”. Aggregation of (mostly non-trend-like) drivers which are thematically related and whose development is correlated. The future development of a dynamic as a whole (without drawing on additional information) is *difficult to predict*.
- “Trend-like dynamic”. Aggregation of (mostly trend-like) drivers which are thematically related and whose development is correlated. The future development of a trend dynamic as a whole is *reliably predictable*.
- “Scenario”. An, in itself, consistent picture of the future (in this case of German economy and society) derived from a given combination of developments of the dynamics considered (and the expected developments of the trend-like dynamics). “Consistent” means here that the interaction of the various elements has been taken into account.
- “Focus scenario”. The one of our four alternative scenarios for Germany in the year 2020 which we consider to be the most plausible owing to the future impact of some of the above “trends” and “trend dynamics”.

Scenario matrix

with two drivers and four alternative scenarios



But our scenario question is multi-faceted; the number of relevant drivers and trends is high. To cope with this complexity without losing too much information we have advanced the above approach: we have aggregated drivers that are thematically related and whose development is correlated into “dynamics” (the trends, too, are aggregated into “trend-like dynamics”, see the figure *Deriving scenarios by reducing complexity* and the box *Elements of our scenario analysis*). Instead of taking individual drivers, we build the scenario matrix *with the two key dynamics*. Further information and a discussion of the merits and drawbacks of this approach can be found at www.expeditiondeutschland.de/en.

... embedded in established multi-country research

This scenario analysis for Germany builds on a Deutsche Bank Research project in 2005 – a forecast of gross domestic product (GDP) for 34 economies through to the year 2020.³ In this project we had combined quantitative and qualitative analysis. However, we were only able to include parameters whose *future development we were able to predict reliably* (quantified growth drivers and qualitatively defined trends). By contrast, in the present scenario analysis for Germany we explicitly also include parameters whose *future development is uncertain*.

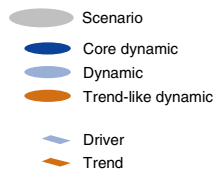
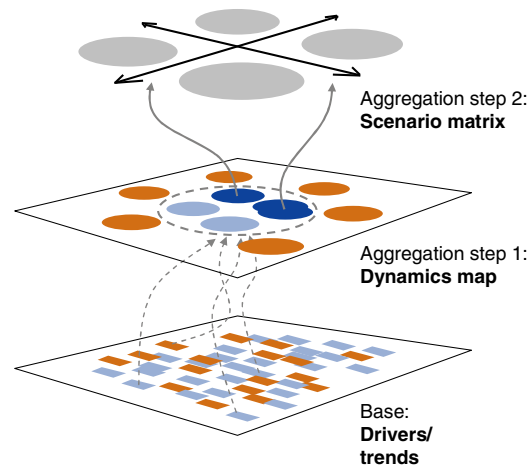
¹ Nonetheless, through interaction with the other drivers, the trends can develop or impact slightly differently or at a different pace in each scenario.

² In the scenario method these drivers are often referred to as “determinants” and the trends as “premises”.

³ Bergheim, Stefan (2005). *Global Growth Centres 2020 – Formel-G for 34 Economies*. Current Issues 313. Deutsche Bank Research.

Deriving scenarios by reducing complexity

in two aggregation steps



Further information on the methodology is available at www.expeditiondeutschland.de/en

The two projects “Germany 2020” and “Global Growth Centres 2020” are closely interconnected, which constitutes a significant advantage of our approach:

- On the one hand, the scenario analysis for Germany serves as a “deep-drilling” for the growth analysis in Deutsche Bank’s home market. The scenario analysis allows a more detailed look for instance at the development of individual sectors and prevailing patterns of cooperation, and in this way backs up the earlier project’s GDP growth forecast for Germany of an average of 1.5% per year for the period from 2005 to 2020.
- On the other, the multi-country research provides a framework of forecasts for the global economic environment in which the scenario analysis for Germany can be embedded (see the section *A look beyond Germany’s borders through to 2020*). That is a major benefit since, on the one hand, it would not have been practicable to extend the scenario analysis beyond Germany while, on the other, an analysis of Germany would not prove to be worthwhile without an understanding of the main developments in the rest of the world.

This interconnection of the two projects works above all because they build on the same trend base.⁴

⁴ The “trend clusters” identified in the earlier project “Global Growth Centres 2020” (see Bergheim, Stefan (2005), loc. cit.) have been elaborated on in the present study and developed into “trend-like dynamics” (see Appendix).

Concept of the “most plausible scenario”

Classic scenario analysis examines alternative future developments – but without highlighting any one of the depicted scenarios as the most probable scenario. For good reason: the scenario method does not in itself deliver any (or sufficient) indications as to which picture of the future is the most probable.

We are deliberately breaking with tradition of future research here: we identified a number of trends or trend-like dynamics which have an exceptionally strong influence and whose general future development can be predicted particularly reliably. They are driving Germany in the direction of one of our four scenarios, and therefore make it particularly plausible. We refer to this scenario as the focus scenario and call it “Expedition Deutschland“. These trends relate to developments in a broad spectrum of fields in business, society and politics as well as in science and technology. They partly reinforce each other, a factor which has further encouraged us to focus on this one scenario.⁵ We discuss these trends in more detail in the second chapter (see section *Why the focus on this scenario?*).

Our focus on this scenario should therefore not be seen as a normative statement: our message is not that we are placing this scenario in the spotlight because it is the “most desirable” one in our view. But, despite all the plausibility bonuses derived from our trend analysis in favour of this scenario over the other three, the following needs to be stressed:

Our focus scenario is not a forecast. In 2020, Germany will look only in parts like we have described in our scenario. Rather, there will be a mix of elements of all four (and maybe other possible) scenarios.

So our message is that, as far as we can judge today, it appears plausible that Germany is more likely to resemble our focus scenario than the other pictures of the future developed here.

What will shape Germany’s future

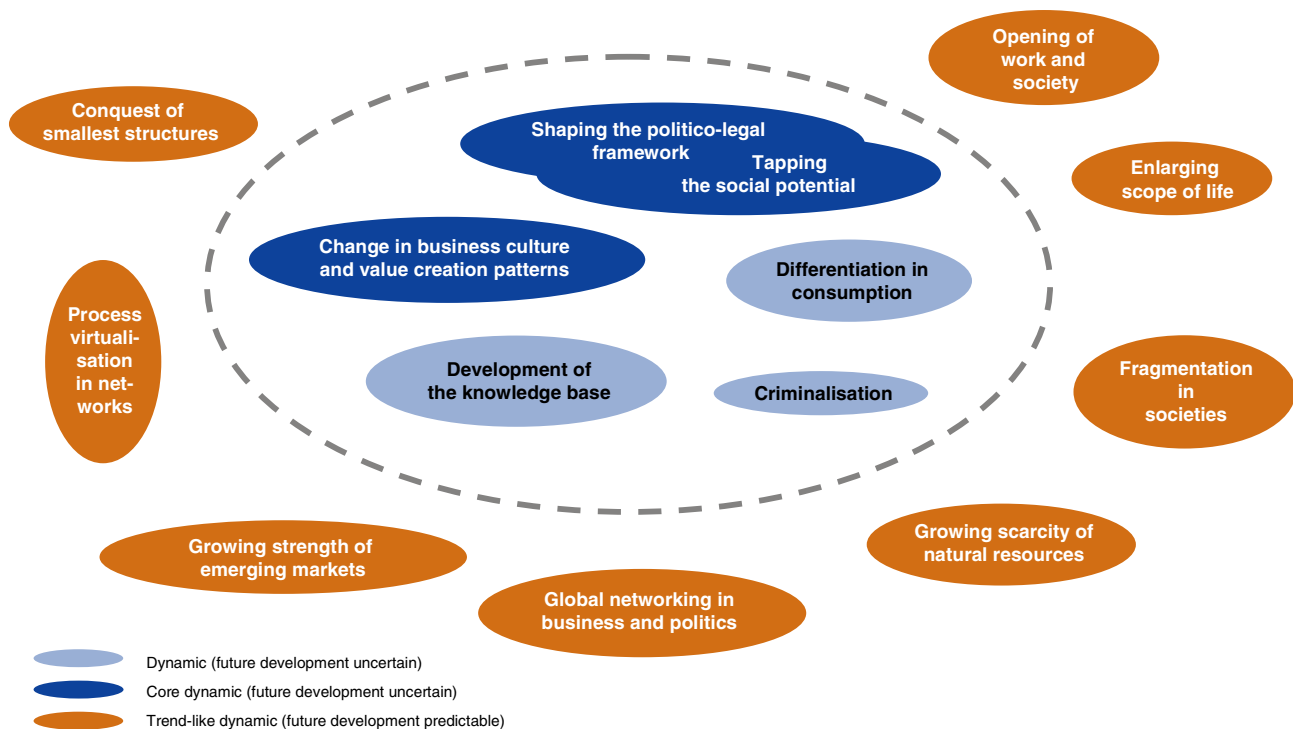
Which dynamics (in other words bundles of drivers) then will be the two key ones for Germany’s future development? The figure on the next page shows our “DBR dynamics map” as the pool of possible candidates. It contains those dynamics (in and around Germany) which, in our view, are particularly relevant for German economy and society. The dynamics shown are divided into those whose future development we believe we can predict reliably (“trend-like dynamics”, outer ring in the figure *DBR dynamics map*) and those whose future development is uncertain (inner circle).

As with a simple scenario approach, we have selected from this pool – in a structured process and together with experts – the two dynamics which will have the biggest impact on structural change in Germany but whose own future development is uncertain. (The choice was therefore limited to the inner circle in the figure *DBR dynamics map*.)

⁵ We had systematically analysed the interactions between many of these trends in the earlier project “Global Growth Centres 2020” (see Bergheim, Stefan (2005), loc. cit.).

DBR dynamics map

The dynamics of structural change



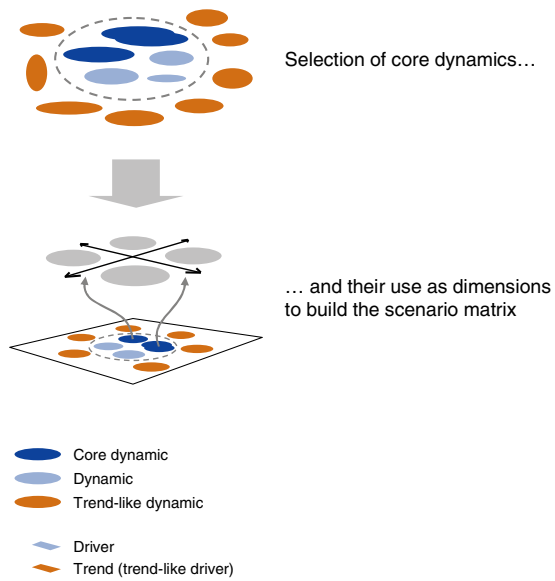
These two “core dynamics” are:⁶

- *Shaping the politico-legal framework and tapping the social potential.* Will government involve citizens and the corporate sector more closely into the regulation? Will Germans want to become more closely involved in politics? Will the middle class dwindle and lose political and economic importance? Will poorly educated people still have a chance in the knowledge society? Will there be a further widening in income distribution? What will we consume, and how?
- *Change in business culture and value creation patterns.* Will corporate Germany open up to new partnerships and forms of financing? Will small and medium-sized enterprises, the German *Mittelstand*, continue to play a prominent role? Can Germany conquer new, lucrative markets for cutting-edge technology and knowledge-intensive services? Will start-up companies play a major role here? What skills will employees need to have?

From the combination of the different developments of these two core dynamics we develop four scenarios for Germany in 2020 (“Expedition Deutschland”, “Wild West”, “Drawbridge Up” and “Skatrunde (Playing Cards) with the Neighbours”; see figure *From core dynamics to scenario cross*). The other elements of our dynamics map, whose future development is also uncertain, are “added on”. Their attributes are selected individually for each scenario in such a way that, allowing for their interaction with each other and with the trend-like dynamics (outer ring in the figure *DBR dynamics map*), this produces a consistent overall picture.

⁶ Our selection was based on other criteria in addition to these two pivotal ones. More information can be found at www.expeditiondeutschland.de/en.

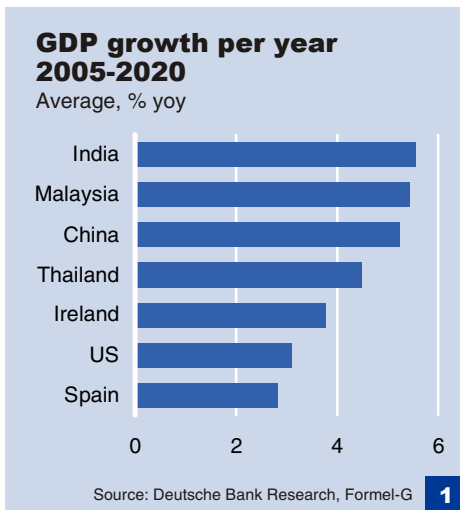
From core dynamics to scenario matrix



The only exception is the dynamic “criminalisation” which relates to new forms of criminal activity and the development of international terrorism. Its future development can hardly be derived from its interaction with the other dynamics. We therefore treat this as a so-called “wild card” which is left out of the scenario analysis.

We discuss the details of the dynamics both in the scenario descriptions and in the appendix (in the form of a more detailed dynamics map).

2. Results – fast-forward to 2020



A look beyond Germany's borders through to 2020

A country's future is determined more than ever today by the developments in other countries. This is true especially of the "export world champion" Germany. So the future development of the global playing field, to the extent that this is predictable, also needs to be considered in our analysis for Germany through to the year 2020. To keep this within manageable limits, we confine ourselves to macro trends which are valid for a large number of countries.

For this purpose we use the "trend-like dynamics" outlined in the figure *DBR dynamics map* – the majority of which apply not only to Germany but to most developed nations and many of (today's) emerging markets. They have all been incorporated in the development of our scenarios for Germany in 2020.⁷ However, in the following we will only discuss the two which will be of paramount importance for Germany:

- The growing economic and political power of many emerging markets (in some cases to such an extent that the term "emerging" will look obsolete), and
- Increasing global networking in business and politics ("globalisation").

We have already analysed these two trends, which are closely intertwined, in detail in previous studies such as the growth forecast for 34 countries mentioned earlier⁸ and a number of long-range country and theme-specific analyses⁹. Besides the perspective here, which is largely directed outside Germany, we will be discussing Germany's integration with the rest of the world in 2020 – as part of our focus scenario – in more concrete detail in the section *Global Integration*.

⁷ Owing to their trend character these dynamics have been incorporated similarly in all four scenarios. However, the trend dynamic itself can have a slightly different development depending on the given scenario. Secondly, its interaction with the other determinants can differ from scenario to scenario.

⁸ Bergheim, Stefan (2005), loc. cit.

⁹ See, among others, Jaeger, Markus (2005). Turkey 2020: on course for convergence. Current Issues. Deutsche Bank Research; Mund, Jennifer (2005). India rising: A medium-term perspective. Current Issues, India Special. Deutsche Bank Research; Voss, Silja (2006). Mexico 2020: Tequila sunrise – A medium-term growth perspective. Current Issues. Deutsche Bank Research; Bergheim, Stefan und Jan Schmitz (2006). Japan 2020 – the decline in trend growth is home-made: Falling labour input and sluggish opening slow growth. Current Issues. Deutsche Bank Research; Bergheim, Stefan (2005). Human capital is the key to growth – Success stories and policies for 2020. Current Issues. Deutsche Bank Research; Neuhaus, Marco (2005). Opening economies succeed: More trade boosts growth. Current Issues. Deutsche Bank Research; Heymann, Eric (2005). Dynamic sectors give global growth centres the edge. Current Issues. Deutsche Bank Research; Bergheim, Stefan (2006). Live long and prosper! Health and longevity as growth drivers. Current Issues. Deutsche Bank Research. Hofmann, Jan und Marion König (2006). Technology boosts trade boosts migration – On the interplay of three key globalisation phenomena. Current Issues. Deutsche Bank Research.

Continued strong growth in future especially in Asia**Emerging markets will invest more in Germany****More migration back to emerging markets****Uncle Sam will still have a lead****Growing strength of many emerging markets**

We expect particularly high GDP growth rates in the period to 2020 in the Asian region – above all in India (average year-over-year growth of 5.5% for 2005-2020 on the basis of *Formel-G* / DB Research), Malaysia (5.4%), China (5.2%) and Thailand (4.5%, see Figure 1). However, Latin American countries – especially Mexico, Chile and Argentina – as well as countries in Central and Eastern Europe and the Middle East are catching up, too. While these countries are still largely the target of investment out of the developed countries, some will also continue to increase their foreign investment in Germany, other developed nations and other (e.g. African) emerging economies considerably in future.^{10,11} In Germany, we expect these countries to invest mostly in local research and development (R&D) capacities, in know-how about local markets and in consumer goods and service brands.¹²

But it will not only be the pattern of international capital flows that will change, migration flows will change, too. We expect that an increasing number of migrants from emerging markets will return home after their training or first years of professional experience in a developed country. They will substantially strengthen the economies in their home countries.¹³ And, finally, borne along by their robust economic growth, the larger of the emerging markets will also gain considerable political influence in the world.

We expect the strongest growth rates in the *developed* countries to be in Ireland, the USA and Spain (see Figure 1). While their growth, at 3.8%, 3.1% and 2.8%, respectively, is still well below that of the fastest-growing emerging markets, it is still respectable compared with the rest of the developed world. We expect the USA's economic influence and innovative strength to still be the global benchmark in 2020.¹⁴

Global networking in business and politics

A central driver of the growing strength of the emerging markets is the transfer of parts of the value chain from the developed economies to these countries, mostly because of the lower labour costs there. The outsourcing of *goods production* across borders is a long-established phenomenon. In fact we expect the outsourcing wave out of North America, Japan and Europe, which has gathered pace over the last two decades, to moderate by 2020.

¹⁰ In 2005, German foreign direct investment (FDI) was equivalent to 9% of global FDI of USD 10 trillion. FDI into Germany accounted for 5%.

¹¹ See Mühlberger, Marion (2007). Africa: From conflict, corruption and crisis to capital inflows, cyclical upturn and China's buying spree. Talking point. Deutsche Bank Research (www.dbresearch.de). Mühlberger, Marion (2007). Africa's natural resources in the spotlight again. Presentation. Deutsche Bank Research (www.dbresearch.de).

¹² See Neuhaus, Marco (2006). Inshoring to Germany: Global networking is not a one-way street. Current Issues. Deutsche Bank Research.

¹³ On the other hand, the successful emerging markets will become more and more attractive as an alternative to the traditional migration magnets also for migrants from less developed countries. Whether this influx of labour into the successful emerging markets will have a growth-enhancing or growth-inhibiting effect in the mid term would need to be analysed on a country-specific basis which would be beyond the scope of the present study.

¹⁴ For a comparison of the innovative capacity of different countries see also: Hofmann, Jan (2003). Innovationsstandort D: Mind the gap! Current Issues. Deutsche Bank Research. Hofmann, Jan (2006). Innovationsstandort D 2012: Vier Szenarien – und Navigationspunkte auf dem Weg dorthin. Presentation. Deutsche Bank Research (www.dbresearch.de).

International trade in services to grow and become more diversified

However, there will continue to be strong growth in the outsourcing of *services*.¹⁵ Today's high growth rates in so-called service offshoring will be reinforced by new target countries (with still comparatively low labour costs), economies of scale, declining transaction costs and a steadily widening spectrum of services that can be outsourced. More and more complex services will become tradable as educational standards in the target countries rise, and communication channels improve and become more widely established in the target country. This holds especially for advanced R&D activities. Moreover, the successful emerging economies themselves will increasingly outsource less complex production and services activities to emerging markets with even lower labour costs.

New actors on the world political stage...

In the political arena the growing strength of the emerging markets will increase pressure to integrate them closely into international coordination processes. Since there will still be many differences compared with the advanced economies in terms of welfare, social model and culture, we expect growing tensions in international organisations such as United Nations Organisation, the World Trade Organisation, the International Monetary Fund and the World Intellectual Property Organisation.

... will increase not only the complexity of the coordination processes in international organisations...

In addition, we expect the need for international coordination and action to grow as a result of global climate change, the growing scarcity of fossil fuels and the increasing number and more rapid spread of global epidemics. We believe that all three phenomena are predictable trends within the time frame of the period to 2020 covered here (and beyond).¹⁶ In all three cases the need for action is internationally recognized – and all three can only be effectively addressed through concerted international action. So, in spite of the growing tensions foreseeable within the international organisations, we expect the international institutions generally to acquire greater influence. Were it not for their role as an intermediary and negotiating platform multilaterally coordinated action would be far more difficult.

... but also the influence of these organisations**Imagery used in the scenario posters**

The visualisations of the scenarios on the following two double pages use the same imagery:

- The characters represent both firms and citizens (cooperating/active vs. withdrawn/passive),
- The characters' immediate surroundings and the rest of the terrain represent the playing field of the markets (known/restricted/interlocked vs. unexplored/open/free)
- The sky and weather reflect the regulatory framework conditions (transparent/coherent vs. intransparent/incoherent).

Four scenarios for Germany – at a glance

On the next two double pages we summarise – in very condensed form – our four scenarios for Germany in 2020 so as to be able to compare their respective core statements. We not only describe the situation in 2020 but also *formulate the scenarios from a 2020 perspective*. As discussed in Chapter 1, we build a scenario matrix with the two most important dynamics (bundles of drivers) as axes/dimensions, with the four fields each representing one of the four scenarios. The core dynamic

- “Shaping the politico-legal framework / tapping the social potential“ ranges from one end of the axis to the other between “coherent” and “incoherent“, the core dynamic
- “Change in business culture and value creation patterns” ranges between the development directions “open“ and “closed”

¹⁵ See Meyer, Thomas (2007). Offshoring work, not jobs. E-economics 61. Deutsche Bank Research; Meyer, Thomas (2006). Offshoring to new shores: Nearshoring to Central and Eastern Europe. E-economics 58. Deutsche Bank Research.

¹⁶ *Global climate change*: see for instance Intergovernmental Panel on Climate Change (2007). Climate Change 2007: The Physical Science Basis. Summary for Policymakers. Paris. *Growing scarcity of natural resources*: see for instance Auer, Josef (2004). Energy prospects after the petroleum age. Current Issues. Deutsche Bank Research. *Epidemics*: Key drivers of the growth in global epidemics are increasing international travel and migration as well as growing international trade.

(see section *What will shape Germany's future* for details of what these dynamics imply). In the description of the four scenarios "Expedition Deutschland", "Wild West", "Drawbridge Up" and "Skatrunde (Playing Cards) with the Neighbours" we divide the first of the two core dynamics into its constituent parts of politics and society for greater transparency. In each case we also sketch the development of Germany's knowledge base ("intellectual capital"). We do not describe the development of the trend-like dynamics in these short overviews as they differ less from one scenario to the other.

We add to the written description of each scenario with visualisations in the form of a "scenario poster" (see the box on page 12 for an explanation of the imagery used).

Four scenarios for

Regulation is inflexible, it is not keeping pace with the economic dynamic – or is being dictated by concerted lobbying. **Entrepreneurial initiative**, much in evidence and mostly in the form of cooperative alliances, has thus become a **risky adventure**.



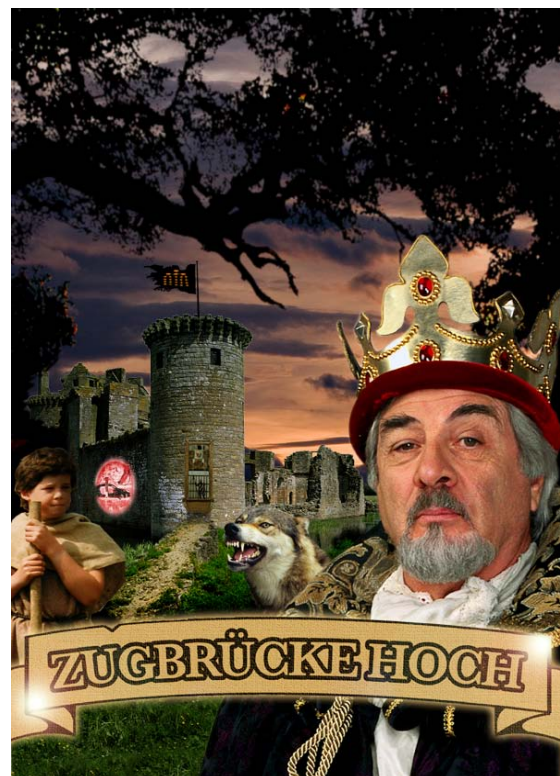
open



Business culture and...
... value creation patterns

incoherent ←

Inflexible, outdated regulation and political wrangling are **stifling entrepreneurial initiative** and social commitment. **Cooperation among companies is rare**; defending vested rights is all important.



closed



Germany in 2020



© Martini, Meyer

Flexible co-regulation is paving the way to new markets. Specialised companies are penetrating these markets in often temporary **project partnerships** – building on traditional value creation processes.

Social potential and...

... politico-legal framework

coherent



© Martini, Meyer

Flexible regulation and an active society would enable new markets to be penetrated. But companies are sticking to their accustomed structures and markets, they are cooperating little or only with **”old friends”**.

Four scenarios for

open

“Wild West” scenario

2020 AD +++ Value creation patterns +++ Much of the value is being created within corporate alliances which are often formed on an ad hoc basis and are mostly not long-lived. Together, they are entering unknown economic territory, but seldom penetrating deeply – the permanence is lacking for radical innovations requiring heavy investment. The new readiness to take risks is reflected in a large number of start-up companies and generous risk capital funds (whose earnings are volatile). **+++ Social potential +++** Inconsistent tax legislation has emptied the state’s coffers, many social security and redistribution mechanisms are out of operation. Many low-skilled people fear for their livelihoods. However, for well-qualified, enterprising and resourceful people there are many business opportunities and (risky) career opportunities. Motivation and entrepreneurial initiative have become more important than ever for income and status. Social commitment is only being shown by those who have succeeded – to mitigate social tensions. **+++ Politico-legal framework +++** Inflexible and fragmentary regulation is not keeping pace with the economic dynamic. The resulting free spaces are driving the spirit of economic renewal. But many entrepreneurial initiatives are doomed to fail because of concealed regulatory pitfalls and often unbridled competition. Regulation is also vulnerable to erratic lobbying by shifting corporate alliances. The upshot is market-distorting framework conditions and an erosion of legal certainty. **+++ Intellectual capital +++** Private learning markets are flourishing, dominated by the offering of small learning modules. They are serving more to prepare people for temporary assignments than for long-term skill development. The public education system is in ruins. The public research system, too – nobody is paying for future-oriented science any more. Intellectual property is not uniformly regulated and is the subject of constant legal disputes.



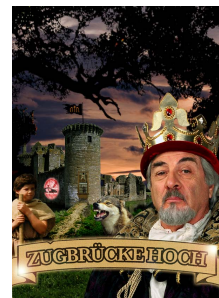
© Martini, Meyer

Business culture and...
... value creation patterns

incoherent

“Drawbridge Up” scenario

2020 AD +++ Value creation patterns +++ Value is being created within established sectoral boundaries, rarely in collaboration and mostly within vertically integrated and long-established large companies. Because they lack courage and are not ready to cooperate they have been thrown back technologically – things have become too complex to go it alone. The few innovations are mainly optimising low-margin product lines. Independent small and medium-sized enterprises are waning in importance. **+++ Social potential +++** Cooperation between the state and citizens has come to a halt – the focus of citizens is often on what they expect from the state. Further, it is not transparent for the individual what services the state is providing and where they need to provide for themselves. The upper class has decoupled from the rest of society; the middle class is dwindling fast since it is caught up in sunset industries. Many lower-class people are left to their own devices because they receive no welfare support; they are largely excluded from the last remaining channel for upward mobility – careers with large established companies. Discounter mentality is dominating consumption. **+++ Politico-legal framework +++** Political wrangling has led to encrusted, intransparent and in many cases inadequate regulation. This is making it even more difficult and costly for the often risk-averse large companies to penetrate new markets. Some are investing a great deal in lobbying, but with little success because of the intransparent regulation. **+++ Intellectual capital +++** Public spending on education is falling, private learning facilities are slow to develop. University education is losing its international reputation; low investment in research is causing the knowledge base to decline. This is holding back the emergence of new growth areas – from data markets to cutting-edge technology. Large companies are assuming some of the training themselves but are focusing on company and function-specific skills.



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closed

Germany in 2020

“Expedition Deutschland” scenario

2020 AD +++ Value creation patterns +++ Cooperation projects between specialised players have become an essential part of the economy – alone the variant of organisationally and legally independent project companies is contributing 15% of value added. Thanks to this new cooperation mentality Germany has caught up in the field of cutting-edge technologies and knowledge-intensive services, supported by many new start-ups and with innovation processes which closely integrate customers. This “project economy” is flourishing on the basis of traditional value creation processes. **+++ Social potential +++** The middle class has stabilised: its members hold many of the lucrative, knowledge-intensive jobs in the project economy, are profiting from the new private learning facilities and are “sovereign” consumers. The professional and social requirements of their new, often impermanent jobs are high. But low earners are under stronger pressure. They often have no access to the learning market, and hence to the project economy. State welfare support is linked to performing community services. **+++ Politico-legal framework +++** Financial constraints have compelled the state to surrender some of its tasks partly or entirely. On the one hand, it is involving firms and citizens in the shaping of new regulatory frameworks while, on the other, it is ceding a growing portion of welfare provision to the private sector. The new patent and copyright laws are encouraging innovation among citizens, projects and firms. **+++ Intellectual capital +++** Broad sections of the population have come to realise that learning is the most important investment for their future. Private providers offer combinable learning modules. This complements the state education facilities which have become more efficient. Germany’s learning market is internationally attractive and is flourishing – so, too, is the trading of data and intellectual property. Knowledge, which is validated and valued, has become the key production factor.



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Social potential and...

... politico-legal framework

→ coherent

“Skatrunde (Playing Cards) with the Neighbours” scenario

2020 AD +++ Value creation patterns +++ Value chains seldom extend beyond the confines of established company “clubs”. Small and medium-sized enterprises are mainly serving as suppliers to large companies. A culture of creativity and the willingness to take risks are poorly developed; customers are playing little part in the innovation process. Innovations therefore rarely conquer truly new areas of technology or markets; the economic focus is on established industries which are past their peak. **+++ Social potential +++** Much of the middle class is employed in low-growth industries. Jobs which have been cut in those industries are not being replaced by jobs created in new markets; this often means social decline. However, the erosion of the middle class is being cushioned by a few new employment opportunities in the moderately growing market for social services. The welfare support still provided by the state is preventing a further social decline of many low earners. **+++ Politico-legal framework +++** As the state is cooperating more closely with firms and citizens, the regulatory framework conditions are quite flexible and future-oriented (though distorted as a result of lobbying by strong corporate clubs); legal certainty is high: an unexploited opportunity for companies to conquer new markets. The state is taking care of the individual to the extent to which its remaining possibilities allow. **+++ Intellectual capital +++** Skills and knowledge are being further developed through a solid state education and research policy; state education services have been improved. But companies are making little use of this potential since there is no culture of renewal. The private learning market is only growing slowly, too. So the new and balanced legal mechanisms for protecting intellectual property are not being filled with life.



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Focus scenario “Expedition Deutschland” – along seven dimensions of structural change

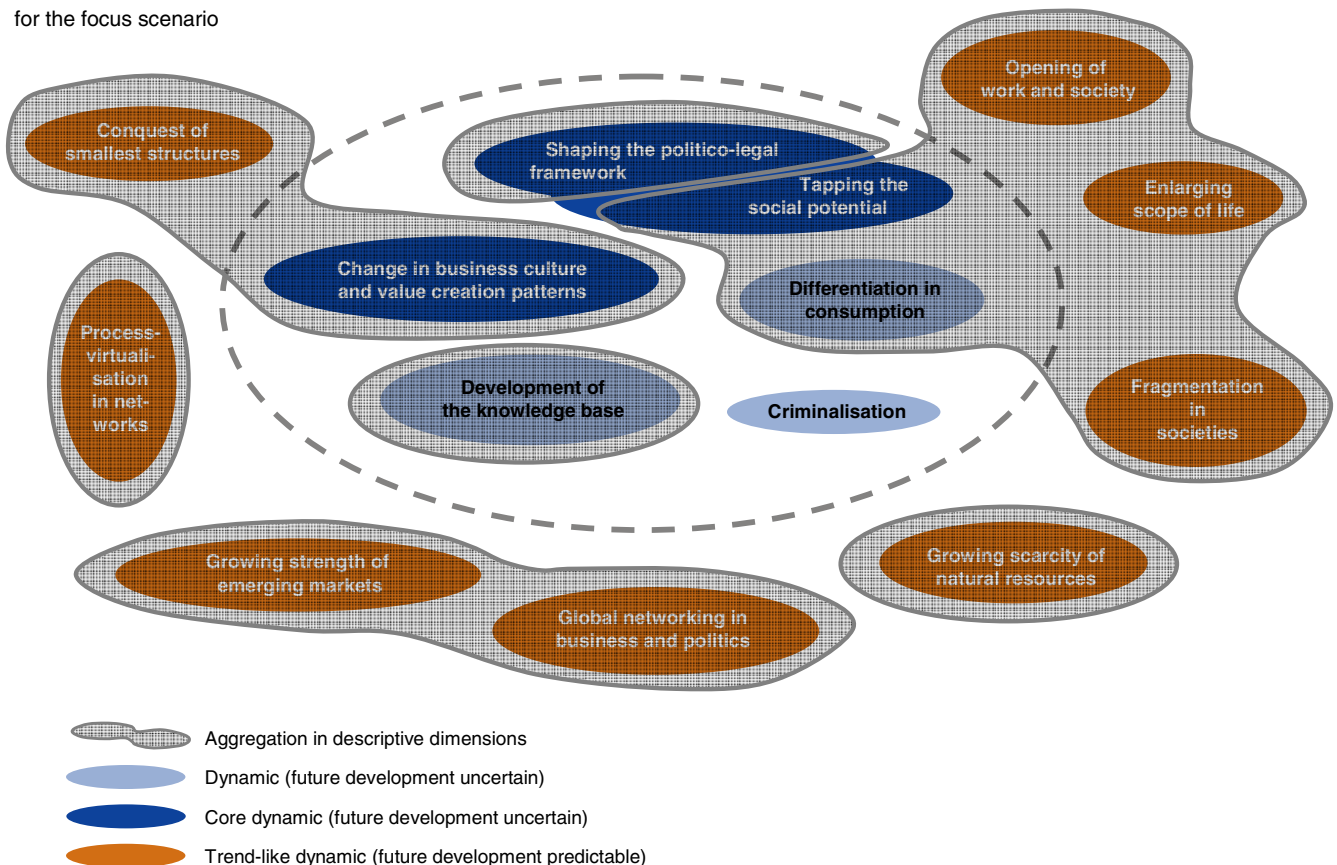
Generally, classic scenario analysis is of little help in ascertaining which one of several (in our case four) scenarios offered as alternatives has the greatest probability of materialising. Analysis of a host of particularly influential and easily predictable trends (or “trend-like dynamics”) convinced us, though, that a development towards the “Expedition Deutschland” scenario is particularly plausible. We shall discuss the impact of these trends on Germany’s development in the section “Why the focus on this scenario?”.

In the following we shall formulate the “Expedition Deutschland” scenario – from a 2020 perspective – along these seven dimensions:

- Value creation patterns (the vertical axis of the scenario cross on pages 14-17),
- Social potential (the first aspect of the horizontal axis of the scenario cross),
- Politico-legal framework (the second aspect of the horizontal axis), as well as
 - Intellectual capital,
 - Digitisation,
 - Energy supply, and
 - Global integration.

Descriptive dimensions

for the focus scenario



These seven descriptive dimensions are sculpted in such a way that they cover all the dynamics of our DBR dynamics map in thematically logical groupings (see the *Descriptive dimensions* figure on the previous page).¹⁷ The political and social aspects of the horizontal axis of the scenario cross are shown separately so that we can take proper account of the complex nature of the “social potential” dimension.

Our scenario depiction focuses on the economic situation in 2020 (actors, structures, processes and achievements). The discussion of society, politics and the state of technological advancement is confined to the aspects that interact particularly closely with Germany’s economic development through to 2020.

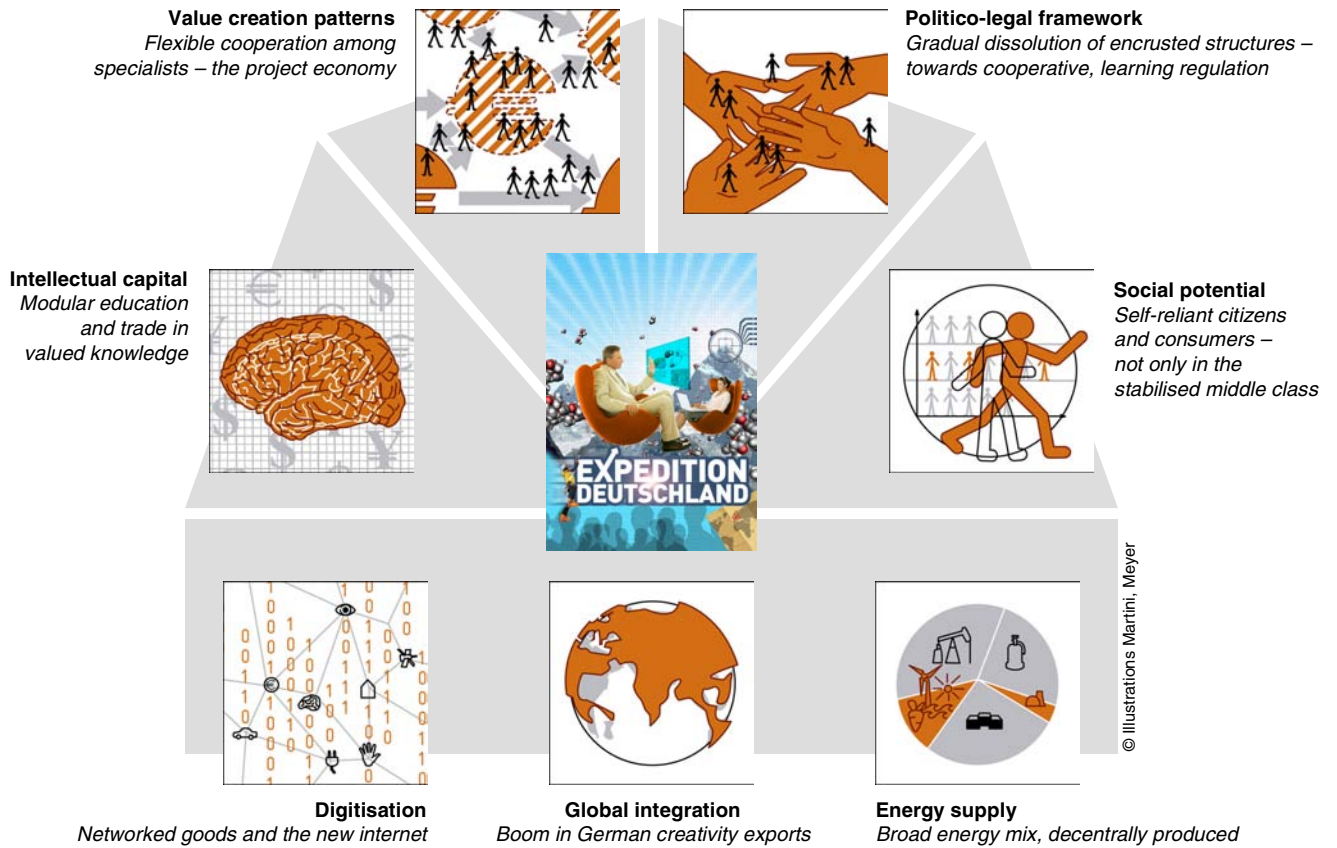
¹⁷ Only the “criminalisation” dynamic is treated as a wild card and disregarded in this analysis; see section *What will shape Germany’s future*.



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“Expedition Deutschland” scenario

An all-around view of Germany in 2020 according to the seven descriptive dimensions



Value creation patterns in 2020

Flexible cooperation among specialists – the project economy

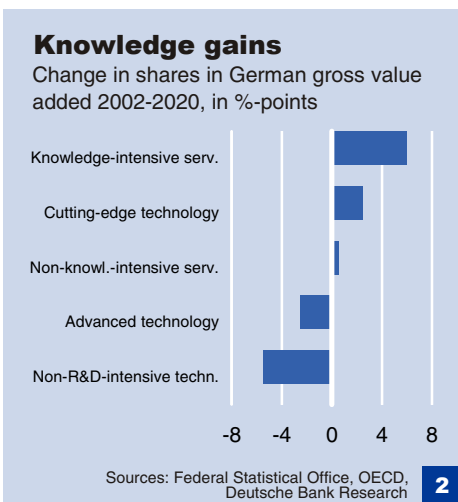


New, flexible cooperation among specialists for success

It is the year 2020. In the past 15 years more and more German companies have realised that to be successful, or indeed simply to survive, they must engage with the rapidly increasing demands in their environments and markets with new, flexible forms of cooperation. The academic community is producing ever more complex knowledge ever faster; once separate areas of knowledge are converging; growth industries' success is increasingly based on this convergent knowledge; demand is increasing for complex system products and packages of goods plus services; and the emerging markets' continued rise is increasing the pressure on German companies to focus on innovation.

Demands of expertise and knowledge can seldom be satisfied alone

These days, producing and successfully marketing cutting-edge technology¹⁸ and innovative, knowledge-intensive services therefore calls for a breadth of skills and knowledge that one single company is but seldom able to provide – and especially not at the speed with which markets clamour for the next product generation. Even at the beginning of the third decade, there are certainly still considerable frictional losses when specialists from different fields work closely together. But after experimenting by the companies, flexible, often temporary cooperation among specialised businesses has proved the more efficient model in many of these markets – and indeed in certain areas the only practicable one.



Cooperative projects often organisationally and legally independent

Collaborative projects of this kind are usually organisationally and often also legally independent. The parent companies make their specialised organisational units available to the project (and often put up capital).¹⁹ As a result, an increasing part of the German economy is now organised into self-contained projects whose members vary as required. This value creation pattern adjusts more flexibly to the greater (knowledge) dynamics in industry, speeds up the process of “creative destruction” and helps avoid unnecessary fixed costs. It also reduces the barriers to market entry for the individual project partners as the required capital can be shared.

¹⁸ The term “cutting-edge technology” in the narrower sense is taken to mean products whose research and development costs account for more than 8.5% of sales. The share of “advanced technology” – which at the beginning of the millennium was still making Germany the “world export champion” – is only 3.5-8.5%. Both belong to what are defined as “research and development-intensive” technologies.

¹⁹ There are three different types of project stakeholders: (1) individuals (often self-employed); (2) proto-corporate players, i.e. parts of companies such as research and development departments or human resources departments (or parts thereof); (3) corporates, i.e. entire companies that engage in projects as part of their business strategy.

This “project economy” delivers 15% of value creation in Germany

Germany leader in project-centric value creation

Project economy diminishes time in market stages

The typology of market stages developed by Ernst Heuss can be taken to illustrate the acceleration in development and product cycles in the project economy and the temporary nature of individual projects. Heuss breaks down the evolutionary process of a new product or the development of a new market into four stages, characterised by the type of competition, use of the parameters of corporate action and specific sales and cost patterns.

The experimental stage (1), the stage at which the product or service is created, can be considerably shortened by cooperating on R&D. At the expansion stage (2) the product and production process can be taken more quickly to maturity, economies of scale achieved by expanding production and pioneering profits increased by bringing appropriate service operators on board (process optimisation, quality management).

Intense competition from imitating companies during the maturing period (3) makes it hardly worthwhile for these pioneers to seek short-term competitive gains through product differentiation. Faced with narrowing profit margins, innovative project stakeholders already begin to withdraw from the market at this stage. They sell rights and technologies to manufacturers from lower-cost countries, for example, or to businesses that specialise in minimising the costs of established production processes. On average the stagnation and scaling-back stage (4), in which increased substitutional competition kicks in, will occur sooner as “sovereign” and demanding customers redirect their interest more quickly to new products and services.

Sources: Ernst Heuss 1965, Deutsche Bank Research 2007.

The project economy – new network on conventional bedrock

This “project economy”, as the business press has taken to calling the greater use of self-contained collaborative projects in recent years, is thriving on the breeding ground of “traditional” economic activity, with both developing in close symbiosis. Current statistical estimates put the share of German value added by the project economy in the narrower sense, i.e. in organisationally and legally independent projects, at 15% at this point in time – 2020.²⁰ This compares with just 2% in 2007 (although the figure was not recorded that way then).

Nowadays Germany therefore plays a pioneering role in project-centric value creation. Certainly, there are similar developments in many other countries (such as the US) and many projects naturally rely precisely on international partners. Nevertheless, the shares of value added in other countries’ project economies are lower, considerably so in some cases.

Project-centric value creation is making such headway in Germany for four main reasons. First, German legislators, in close cooperation with the business community, developed and introduced early on adequate legal forms and taxation parameters for project entities. The Private Equity Act²¹ that came into force in 2008 provided a major impetus, particularly for the funding of innovation-intensive projects. Second, for decades now the federal and state governments have lent comparatively strong support to local innovation clusters – a key element of a successful project economy.²² The biotech cluster near Munich and the cluster for optical and solar technologies in Thuringia have acted as powerful stimuli, and continue to do so.

Third, the project economy enables medium-sized companies in particular to spare their resources while building up their innovative capacities. Moreover, in legally independent projects they can try out capital market-based financing tools without surrendering control of the company itself to the capital market.^{23, 24} And in no other economy do small and medium-sized businesses play such a vital part as in Germany (the so-called *Mittelstand*). This gave the German government and lawmakers added motivation to commit to adequate new legal models. Fourth and finally, the particularly broad spectrum of technological niche competences in Germany provides a sheer unending repertoire for recombination into new “modular products”. Successes here include energy-saving construction with combinations of smart home, solar energy and insulation solutions.

²⁰ Precise recording is still difficult because a project entity is hardly distinguishable from an “ordinary” company on the basis of its business registration, legal form, balance sheet or profit and loss accounts. Special censuses were therefore carried out in 2013 and 2017 to pave the way for standardised registration.

²¹ A refinement of the Act on Equity Investment Companies (UBGG).

²² Hofmann, Jan (2005): Europe’s hottest R&D region is ... Braunschweig! Talking Point. Deutsche Bank Research (www.dbresearch.com).

²³ Of course, not all kinds of capital market funding for businesses imply a loss of control of the company itself to the capital market.

²⁴ Also, the medium size itself is an advantage in the project economy, see the section *Specialised stakeholders, often midsized*.

The project economy thrives on the bedrock of the “traditional economy”

Nowadays, collaborative projects between businesses and between businesses and universities or public research institutions that do not culminate in legally independent special purpose vehicles are also classified as belonging to the project economy in the broader sense. Their number has grown steadily over the past two decades. But even now, in the “traditional” part of the economy many companies still produce and sell their goods and services on a go-it-alone basis or in traditional producer-supplier structures, integrating a large number of stages of the value chain and overhead functions for the process. Many are increasingly specialising in specific goods or services markets, or market niches.

Project economy and growth crises

In an evidence-based organisation theory model it is assumed that organisations pass through typical crises at certain stages of their growth. Organisations stumble over crises if they are unable to adapt their management to new requirements. Larry Greiner has identified five growth phases and the crises accompanying them.

Where a start-up organisation is geared to creativity, it is precisely this creative explosion that often ends in a *leadership crisis*. Where a company succeeds in directing creativity by professional management, it runs the risk of robbing staff of their autonomy (*autonomy crisis*). By creating freedom of action again through delegation it runs the risk of losing control (*control crisis*). If control is regained through set procedures a company threatens to be suffocated by bureaucracy (*red tape crisis*). If a company unravels red tape with motivation initiatives, there is a threat of disintegration as motivated staffers develop too much activity (*synchronisation crisis*).

So growth appears to be an insoluble task! Alongside tried-and-tested methods, by 2020 companies have learned to avoid crises with extra-organisational, project-economy solutions. Pioneers sell their projects before they are brought down by crises, and staff kept in leading strings are unfettered in projects. Properly charted and synchronised, projects do not lead to confusion. In projects with lots of equal partners bureaucracy is unlikely to develop in the first place. And motivation crises can be averted by offering motivated employees fields for experimentation with corporate venturing and projects.

Sources: Larry E. Greiner 1972, Georg Schreyögg 1996, Deutsche Bank Research 2007

Most project economy stakeholders functionally specialised

Specialised stakeholders, often midsized

Nowadays, however, the typical stakeholder in the project economy usually specialises in a certain part of the value-adding stages or functions. In the traditional economy, they are mainly integrated *within* a company. Examples for such functions include research and development (R&D), automated production, and the management of quality, brands or – increasingly importantly – cooperation and seam management. What is more, further specialisation is taking place within these segments. Labour-intensive production, on the other hand, like many standardised (and a growing number of specialised) R&D services, has continued to be outsourced in recent years to Asia and central and eastern Europe. This applies equally to companies in the project economy and in the traditional economy.

Medium company sizes often expedient in the project economy

Also, many typical project economy stakeholders are medium-sized enterprises. On the one hand they are large enough to be able adequately to diversify their risks in spite of their strong specialisation (different teams in the company can work in parallel on entirely different projects). And on the other they are small enough not to be slowed down in the dynamic project economy by the inflexibility typical of many larger corporations. A more open, less hierarchical management culture than under the old regime, new

corporate governance structures²⁵, more decentralised decision-making processes and more employee participation have further boosted their flexibility. (This also applies to both the project economy and to areas in which traditional value creation patterns are predominant.) But alongside medium-sized companies, micro businesses and corporate heavyweights also play a part in the project economy. Particularly in complex infrastructure projects the resources of a big corporation are often needed.²⁶

Successes with cutting-edge technologies, reluctance over long-term R&D

Germany has made up ground in cutting-edge technologies...

In 2020, the new, more open culture of cooperation has helped Germany to make up ground again on its international competitors in the structural shift towards greater focus on cutting-edge technologies. After years, and in some cases decades, of intensive research, Germany was already internationally well positioned in 2007 in academic research in certain fields of cutting-edge technology. Microsystems technology, environmental engineering, optronics and biotechnology spring to mind here. Moreover, Germany has traditionally been strong on middle-tier qualifications for skilled workers. Many of these technicians have received further training in recent years, partly at universities, qualifying them to work in cutting-edge technology sectors.

From the middle to the top with academic qualifications...

... e. g. towards “ecological excellence”

... bolstered by smarter regulation

Drawing on these strengths, the more open culture of cooperation at companies in general and the project economy in particular have helped to push R&D in application-oriented cutting-edge technology and ultimately to bring attractive products to world markets. Since the second decade this has been facilitated by the more rapid pace of deregulation and intelligent new regulation of labour and product markets. Politicians, too, had gradually come to realise that flexibility was a major ‘must-do’. This was already becoming apparent back in 2007 with growing moves to cut back on red tape.

Industry shies away from long-term R&D projects – even those with a strong application focus

One fly in the ointment is that the extreme flexibility of the new cooperation patterns in recent years – and, indeed, their volatility in some cases – has made it more difficult for business stakeholders to engage in very long-term R&D projects. Even at the turn of the millennium, basic research was almost exclusively the province of state universities and public research facilities; but in the past decade a major part of longer-term application-oriented R&D has also been shifted onto the state sector, albeit partly in the form of public-private partnership projects.

3% R&D spending target not reached until 2018

Given the public sector’s severe fiscal constraints, politicians and scientists have been lamenting this shift with growing vehemence for some years. It was only two years ago, in 2018, that Germany reached the target of lifting R&D spending to 3% of GDP that it and the European Union had set for 2010. The EU is still way off course. There are fears in Germany (and Europe as a whole) that development of that part of the knowledge base geared to basic research will slow in the long run – a trend that was already the subject of much debate in the US at the beginning of the second decade.²⁷

²⁵ E.g. in respect of supervisory boards and co-determination.

²⁶ One example is the search for promising business models in the course of convergence of the internet, telephony and television. In the second half of the first decade companies experimented here in a variety of flexible partnerships.

²⁷ As early as 2005 the US National Science Foundation cautioned emphatically against this trend in the United States. It pointed out that America’s business successes in the technology sector, particularly in the 1990s, rested on efforts

Smarter regulation helps foster healthy growth in venture capital investments***Entrepreneurs – the avant-garde of the project economy***

By contrast, the picture for less long range, more market-based R&D now looks far brighter. Here, smarter regulation has encouraged the venture capital investments in young German start-ups that dried-up with the stock slump markets at the turn of the millennium. They edged up tentatively as from 2004 and then on a healthy scale again from the end of the first decade. More investment has also been made at the seed stage, in which funding is provided to set up businesses. For one, in 2008 the Private Equity Act (Beteiligungsförderungsgesetz) introduced tax incentives to investment in venture capital funds, and for another entrepreneurs found it easier to move into new technology fields again once various regulatory obstacles had been removed (e.g. to genetic engineering).

Spin-offs were nucleus of the new culture of cooperation

Looking back, spin-offs from universities supported by this venture capital, and also hive offs from research and development departments at big corporates, were the nucleus and avant-garde of the new culture of cooperation.²⁸ The entrepreneurs brought along specialist knowledge, which they had to fuse with specialist knowledge from other stakeholders to develop products that would perform successfully in the marketplace. This was necessary partly because successful products were increasingly becoming complex systems from different technologies (with the new biometric sensors as a case in point), and partly because the successful products were based more often on converging fields of research (such as bioinformatics, neuroinformatics or synthetic biology). Where this cooperation worked well and the entrepreneurs then wanted to go on and develop the next product, they frequently discovered that they needed *new* external expertise for the purpose.

Start-ups generally grow within their area of specialisation...

To stimulate their companies' growth, many entrepreneurs therefore opted to expand within their area of expertise rather than integrating ever-new fields of knowledge and qualification into their own organisation. As their organisational size increased, so they were able to contribute their special competence into more than one project at the same time, thereby diversifying their risk. Many of these start-ups have today evolved into mid-sized R&D and production service operators with considerable earnings power.

... and reap the benefits of successful projects in various ways

Some operate strictly as service providers (generating revenues from their participation in a project in the form of service fees only), some participate in the financial success of a project through royalties on jointly developed and jointly owned intellectual property, and occasionally even through equity capital. Even if they provide services only, it is important for them that the project performs well. Their reputation is at stake – and with it their participation in forthcoming projects and the role they will play in them.

Cooperation among specialists also beneficial to knowledge-intensive services

Flexible cooperation among specialists additionally often proves an efficient way of developing and marketing new, knowledge-intensive services. Both government and industry have intensified their R&D effort in this area over the past 15 years. Of course, even now – just as in 2007 – only some of these R&D-heavy, often high-risk projects prove successful. Not even the cooperation models in the project

made in the past that were no longer being undertaken on such a scale at the time those successes were materialising.

²⁸ On the role of venture capital in company start-ups see Meyer, Thomas (2006). *Venture Capital in Europe. Spice for European economies*. E-economics 60. Deutsche Bank Research.

Germany gained comparative advantage in user-centric innovation...	economy can prevent some technological developments from failing or consumers from ignoring a new technology or service.
... by engaging the customer closely in the innovation process...	<p><i>Capturing markets with the customer</i></p> <p>Far more companies than in 2007 – project entities and traditional businesses, in Germany and other developed countries – now have their comparative edge in the early stage of product development. In this phase it is important to understand what customers actually want and to translate this swiftly into marketable product concepts (for goods and services).</p> <p>The best way of achieving this is still through geographic and cultural proximity to demanding customers and by systematically letting them have their say in product development in open innovation processes (“prosumers”). To address the needs of high-end consumers in other countries too, German companies are also cooperating more closely with local innovation stakeholders (and frequently networking their knowledge of local circumstances with the corporate innovation centres in Germany, which contribute the particularly knowledge-intensive elements).</p>
... and with its internationally successful creativity and innovation service providers	<p>As a result of this focus on the early innovation stages, the role played by creative or creativity-supporting service providers has gained enormously in importance. Design agencies, trend scouts and foresight experts, ethnography agencies and general providers of moderation and creativity services (plus new players that have intelligently combined these offerings) are set for success alongside traditional R&D service suppliers</p>
This has created new markets	<p>This concentration on the early stage of product development has also led to companies and projects in which Germans are involved producing not only purely technological innovations (one of Germany’s traditional strengths²⁹), but increasingly also innovations that actually create new markets. Not only do they better satisfy existing demand, they also create demand in new areas, addressing needs that could not be adequately satisfied previously – and, indeed, of which consumers may not even have been aware (once a weakness of German innovators). In the development of goods this often takes place without a technical revolution, using instead technologies in new configurations and better customer/user interfaces. One illustration is 3D ceramic printing, with which “customised mass production” is now possible. Similarly, drugs tailored to small sections of the population have been successful only as a result of new methods in the analysis (medically in this case) of customers’ needs.</p>

²⁹ Germany is traditionally strong on technically incremental and technically revolutionary innovations – providing they continue down the “performance path” already taken, i.e. the progress they create continues to be registered in the same unit of measurement (when launched, airbags were a technical revolution, but ultimately they merely improve the “passive driver safety on vehicle impact” parameter that had already made massive advances in the preceding decades.).

Project Economy lowers transaction costs and strengthens the market

Whether business transactions are conducted on the market or within a firm is critically determined by the transaction costs incurred. Information costs, bargaining costs and enforcement costs are summarized under transaction costs. Market contacts are transformed into contracts within the firm when this saves costs. This substitution takes place until the transaction costs that arise within the firm reach the level of the transaction costs on the open market.

According to this approach, developed by Ronald Coase, transaction costs fall the higher the number of transactions. Transaction cost-cutters in the project economy, besides the number of projects, are digitisation, e.g. through database networking, or the development of virtual collaborative environments. Further factors lowering transaction costs are trade in valued knowledge (information costs), the interest in establishing standards and, in the context of bargaining and enforcement costs, smart co-regulation in particular.

The temporary nature of the projects reduces project stakeholders' mutual dependence and hence the incentive to secure quasi rents through opportunistic behaviour. The incentive to behave opportunistically is further reduced for the project stakeholders by the considerable importance attached to reputation as specific capital in the project economy. High reputation, in turn, lowers the information and bargaining costs and thus benefits the project economy.

Source: Ronald Coase 1937, Deutsche Bank Research 2007.

“Q Inno Services”

The analogy in the development of services is the new combination of existing processes. Here, too, the interface to the customer is usually the crucial factor. In special demand nowadays are, e.g., personalised mobility services that connect different means of transport as the situation requires, skilfully integrating possibilities for social interaction. Another successful example is quality innovation services (Q Inno Services), new, knowledge-intensive services combining quality and innovation management even more efficiently than back in 2007.³⁰

In short: “Expedition Deutschland”

This capturing of new markets – as well as research on and increased economic utilisation of cutting-edge technologies – was facilitated by a slow but steady trend towards more intelligent regulation of labour and product markets. The reputed news service *WikiNewsflash* even recently ran with the headline “Expedition Deutschland” to underscore the explorative nature of the German project economy – and German society as a whole's greater willingness to countenance risk.

Contractual guarantees on project input and profit sharing more important than ever**Old success criteria still highly relevant**

Today, in 2020, expedition members network with – often international – business and science partners in changing collaborative and legal forms to bring products quickly and efficiently to market. Adequate contractual covenants of cooperation are consequently more crucial than ever to the success of a project. The individual project contributions, the distribution of profits, sharing of rights to jointly developed intellectual property³¹, and the

³⁰ In the year 2020 these services help to integrate quality aspects even more actively into the innovation process than in 2007. This enables businesses to comply with regulatory requirements on product liability at the development and design stage already. Iteration loops can thus be avoided and better products brought more quickly to market. “Q Inno Services” have thus also helped turn businesses that once pursued conservative product policies into innovators and previously not very open-minded, innovation-shy customers into early adopters.

³¹ Even in the early stages of the project economy it very quickly emerged that project stakeholders must agree by contract on the allocation of rights to intellectual property developed in the course of a project at the very outset of their collaboration (as is also customary for the distribution of profits). This applies to legally independent special purpose vehicles and less formal cooperation alike. These days, the allocation of rights is geared partly to the respective ownership and equity shares; but particularly in R&D-intensive projects it is often determined

Legal counselling even more important

apportionment of long-term product liability among the project stakeholders are just some of the issues that have to be clarified.

The good headway Germany has made on smarter, simpler regulation has turned German “project law” into both a byword and an important locational factor. Even so, the specific contracts needed for each project are still copious. This is because the international convergence of legal standards has been only modest so far (checked partly by regulatory competition between nations), particularly in the case of cross-border cooperation. Legal counselling has become far more important as an integral part of the value chain.

Local cluster still important

Another criterion for success that still counts for a lot is intensive and trustful networking in a *local cluster* (with partners from science and industry, with customers, with financiers and sponsors as well as with the labour market). International networking delivers ideas, special skills, knowledge of distant markets or quite simply cheaper factor costs for a company or project; but most special purpose vehicles and conventional businesses continue to benefit from being rooted in their local cluster, particularly when the focus is on innovation. Here, local spill-over effects have traditionally been a key ingredient of success.

Shorter-lived projects borrow stable brands

The recurrent shift in stakeholder constellations has also lent added significance to brands. Often, brands are the only way of presenting a constant, reliable face to the consumer. While consumers appreciate the competitive prices and innovative offers in the project economy, they still seek clear and consistent quality and style signals. In some longer-term projects brands are developed jointly by the stakeholders and copyrighted jointly as part of the special purpose vehicle. Shorter-lived projects are increasingly “borrowing” established brands, i.e. licensing them from third parties.

No bed of roses for the employees**Exacting demands of employees’ social and technical skills**

Much is expected of the project stakeholders’ employees – and the many self-employed popularly integrated into such projects. Working on constantly new projects often entails frequent changes in co-workers and locations and unsettled social environments. These repeated changes in working environment have turned social skills into a core qualification in many cases. What is more, not only must workers in the project economy always keep abreast of the latest general developments in their particular field, the specific technical requirements can also change from one project to another. A quality management engineer currently monitoring the production quality of a liquid food supplement may find himself assigned to a project on tap water purification a few months farther down the line.

Professional background networks have become more important

Families and friendships, themselves under stress in this volatile environment, are particularly important as familiar, steadying influences and somewhere to “recharge the batteries”. And many professional cross-company background networks (such as the *European Society of Chartered Quality Management Professionals* established in 2010) provide added social support and ongoing peer exchange. Not infrequently, ideas for new projects are also spawned

by the innovative contributions that the individual stakeholders are expected to make. To facilitate assessment of what is basically an uncertainty factor one of the innovative capacity ratings common in 2020 is often consulted, together with weighting of the expertise contributed to the planned project. Aspects flowing into project participants’ innovative capacity ratings include their previous participation in intellectual property development, its market success so far, participants’ qualification profiles and vocational/advanced training measures.

there. This age-old form of interaction and focusing interests has gained massively in importance in the project economy.

Banks treading new paths – also in the project economy

As the project economy was arising, so the German (and European) financial services industry was in the throes of radical change. Consolidation came in several waves, increasingly also across national borders; many banks and other players have specialised in particular market niches, modularising their products and outsourcing more and more of their value chains; and mounting cost pressures have resulted in the strong standardisation of financial market products and the consequent “industrialisation” of the way in which these are produced.

These changes were not driven by the emergence of the project economy. But the financial services industry naturally finances the project economy and uses it as an area of investment for itself and its clients. As with its other corporate clients, it employs a constantly widening spectrum of innovative financial products for project finance. Traditional bank loans have been taking a back seat for years: since the turn of the millennium the share of lending to non-banks has contracted relative to GDP in Germany. (Financing itself is also increasingly assuming the form of legally independent projects, using special purpose vehicles set up for the individual financing transaction.)

Both funding for the project economy and its use as an investment target are posing fresh challenges for financial services providers. For one thing, rating the innovation-oriented companies operating so successfully today has generally become increasingly difficult, be it in the course of conventional lending or complex securitisation. Their future performance depends more than the performance of traditional industrial companies around the turn of the millennium on their intangible capital, which is more difficult to “get a grip on”.

Second, with more and more stakeholders combining into temporary and flexible independent projects, part of industry is becoming a movable target in terms of rating. Increasingly these days, projects (and not the companies involved in them) are the units that financial services providers and the capital market have to evaluate. Extensive rating histories and contacts between banks and management that have evolved over the years are rare in this project assessment. For companies taking part in projects, their “cooperation rating” has become a substantial part of their overall rating. The cooperation rating measures, among other things, the companies’ reliability and efficiency in assigning teams to projects.

Financial services: consolidated, specialised, modularised, industrialised

Project economy an attractive finance and investment field

Valuation of intangible capital rapidly gaining in importance

Valuation more often geared to “movable targets”

Cooperation ratings high up on the agenda

Social potential in 2020

Sovereign citizens and consumers – not only in the stabilised middle class



Project economy stabilises parts of the middle class

The project economy has not only speeded up structural shifts in Germany towards a more flexible, knowledge-intensive, innovation-based economy. This change has also enabled a new upward social mobility that has helped stabilise sections of the German middle class. Admittedly, middle income earners still face heavy redistribution burdens and (like the other sections of the population) are under pressure from increasing expenditure on healthcare, retirement provision and education.³²

However, they have benefited to a far greater extent than the lower-income and low-skilled groups from growth in the knowledge-intensive sectors often organised in project economy-style. The middle class have participated both through dependent employment and through project and company set-ups. This has given them the financial means to make greater use of the learning services (education and continuous training) offered by private providers.

Opportunities of education (and risks from lack of education) now more transparent

As the second decade of the 21st century dawned, growing numbers of the middle class began to perceive education as an investment in their future. They increasingly demanded learning services on the basis of varied financing options (ranging from student loans to learning accounts). Demand has received a further boost as the opportunities for future personal prosperity through education – and the risks of downward social mobility caused by a lack of education – have become much more transparent for the individual than they were 20 years ago. Media reports on the “new shining stars” of the knowledge-intensive economy and on those who have failed to make the grade play a part here. Meetings with bank account managers are another eye-opener: nowadays clients’ learning biography is crucial for their personal lending terms.

Flourishing market for structured, often private learning services

As a result the market for learning services in Germany has grown dramatically. These services have become increasingly structured and are often certified. The new private (and public-private) providers on this market were able to adapt more adequately to the needs of people working in the project economy than the basic education offered by the state. These providers have arisen in parallel to the project economy – on the basis of projects such as spin-offs from public education providers or cooperation between public and private providers of learning services. Regulators have paved the way for this with faster and more reliable certification and

³² See Gräf, Bernhard (2006): The demographic challenge. Simulations with an overlapping generation model. Current Issues, May 19, 2006. Deutsche Bank Research.

Middle class earns well in the project economy

accreditation procedures. Providers of learning services now generally respond flexibly to the needs of individual employees or companies. And they have also helped make their publicly funded and managed competitors become more dynamic and efficient.

With the help of these improved learning offers many people from middle class backgrounds have acquired further skills. Older people, too, can now remain suitably skilled for longer. The middle class thus delivers the bulk of employees in the knowledge-intensive part of the German economy. They additionally benefit from profit sharing schemes designed to bind them more permanently to the company in an age of global markets for highly skilled labour. Schemes of this kind have become more important than ever for companies given the lower barriers to venturing into self-employment in the project economy.

More highly skilled workers migrate to Germany***Germany as a migration magnet***

These profit sharing models have also contributed to a strong latter-year surge in migration to Germany by highly skilled workers. An additional attraction for highly-skilled foreign workers is the high fluctuation of staff in Germany (despite these models) between science and industry. It broadens the range of career prospects for high potentials on both sides. Word has also spread among potential immigrants of the advantages of the German learning market. And in general, the powerful dynamic of German industry's knowledge-intensity by international standards is an added drawing card.

These immigrants further bolster the middle class. Many of them make Germany their permanent home, not least because of its political and social stability, guaranteed civil liberties and good environmental conditions. Particularly regarding social stability Germany is in a better position than other developed countries. They were – and partly still are – embroiled far more deeply in the distribution conflicts of the 20th century.

Many people on low incomes cannot access private learning services and the project economy...***People on low incomes under pressure...***

Low income earners, on the other hand, derive little benefit from the project economy. Although their participation in secondary and tertiary education has been gradually widened over the past 15 years, the majority still fail to obtain sufficient skills making them employable for highly knowledge-intensive positions in the project economy. They are often unable to access the at times costly facilities of private learning services providers. A welcome development, though, is the far stronger commitment by foundations and trusts. They are coming to realise all the more clearly that supporting the education and training for financially worse-off talents is not only desirable, but indeed absolutely vital for society as a whole.

... and their wages suffer from the global division of labour

Moreover, the wages of the not inconsiderable proportion of people below the middle class that had, and still have, no access to higher education remain under pressure from the international division of labour, technological progress and further low-skilled immigration. The same is true of less educated individuals belonging to the lower middle classes. Most of them do not manage to cross the divide into more knowledge-intensive work; some slip out of the middle class in terms of their income and social status.

State support now only on a reciprocal basis...***... but “stakeholder society” offers new opportunities***

Below the middle class, it is not unusual these days for people to have more than one job in order to earn enough to live. Added to



which, Germany's narrow fiscal scope for redistribution, in meltdown for a long time, has turned it into a "stakeholder society" in which practically every recipient of financial support from the state must render a service to society in return. One example is social services such as help for the rapidly growing group of elderly enabling them to continue living in their own homes (from shopping through cleaning to accompanying them on leisure activities).³³

Expedition – more capabilities

In the EU the poverty line is drawn in 2007 at 60% of the median national equivalent income. In juxtaposition to this, noble laureate Amartya Sen describes people as poor if they do not have the chance to live a life they have good reasons to choose and that does not call into question the basics of self-esteem. The *capabilities* include the realisation of individual potential and social freedoms.

Individual potentials – income or assets, state of health or a person's own education – are just as important as social freedoms. These include access to an education and healthcare system and to adequate living space as well as economic opportunities such as integration into working life. Further social freedoms are a sufficient degree of social and ecological security, protection against crime, opportunities to take part in political life and guaranteed transparency in respect of state welfare benefits and laws.

The structural changes as a result of Germany's expedition – most notably the project economy – improve access to labour markets and educational facilities. In the altered politico-legal framework the opportunities for political engagement and action, the transparency of laws and welfare benefits, and social and ecological security improve. On the expedition, more people have a chance to realise their potential and give something back to society to the best of their abilities: In all kinds of projects, claimed and fostered by (state) administrations and different communities, both the realisation of a smoothly functioning, integrative "stakeholder society" and the self-realisation of the individual rank highly.

Sources: Arndt et al. 2006, Sen 2000, Deutsche Bank Research

... which can, however, act as a step-up into the working world...

Social services of this kind can give some of these low earners a step-up back into 'real' work. A rapidly growing private-sector market has arisen in this segment in recent years as a result of population ageing and the necessary downscaling of state activity. This market can absorb employees with the relevant practical experience and provide them with vocational training. The principle of a "stakeholder society" and the market for social services thus again enable some people to climb the social ladder out of the lower classes in a way seldom seen 15 years ago. Today's more varied range of social services also helps at least lighten the load for employees in the project economy, who are often under enormous work pressure. Childcare or care for old people are just two of the many often privately managed tasks that social service providers can ease against adequate payment.

"Statutory retirement age"?

... into which many older people are now also intelligently integrated

The share of older people active in the project economy – and the rest of the economy as well – is far higher than it was 20 years ago. (Instead of looking after their parents they are often taking care of their partner.) After heated debate, the official retirement age was raised to 69 in 2013. However, the contracts for many legally independent projects by-pass this age limit it is becoming less important.

The new "integration models" have proved a more important driver for keeping older people employed longer. The best of these

³³ Bergheim, Stefan (2006). Live long and prosper! Health and longevity as growth drivers. Current Issues, March 20, 2006. Deutsche Bank Research.

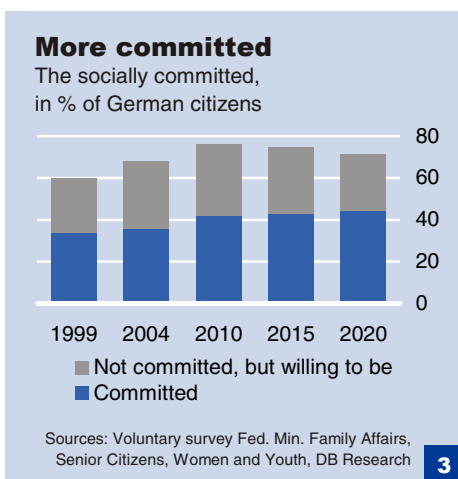
Many older people have “project careers”

combine a whole gamut of measures, which generally begin with comprehensive knowledge and experience evaluation. This enables employers to identify older workers’ existing comparative advantages, such as experience and networks, and to bring these to bear exactly where they are needed. Vocational training modules often follow. In addition, employers now address specific needs – restrictions on mobility or the limits to workload tolerance, say – far more sensitively.

And finally, a growing number of employers have realised that projects are a good way of integrating elderly workers temporarily and for flexible periods of time. This has reduced employers’ reservations about recruiting older people and offered many senior citizens new opportunities late in life. Nowadays even less skilled older people can thus be given more of a chance to prove their skills and worth as employees. At a time when the supply of younger workers is dwindling, all this has proved a relatively small price to pay for access to urgently needed human capital and has cushioned the effects of the “demographic plight”. Only shortly after the turn of the century many observers feared that Germany’s competitiveness would suffer far more severely from its ageing population.

Diversified life styles enrich old age

On the contrary, older people’s active participation in “Expedition Deutschland” has turned the integration of this part of the population into an international role model in terms of its work ethic. Outside working life, too, more elderly people are managing to realise their ideas and dreams in 2020 than they did at the turn of the millennium. Of course, now as then physical or mental restrictions still prevent a lot of people from doing so. But even back then there were many different forms and norms of old age, and the spectrum is now, in 2020, even more varied, due in no small measure to the baby boomer retirees. This has naturally widened the scope of older people’s personal aspirations. Nowadays these include – alongside many leisure activities that once seemed to be the exclusive province of younger people – a commitment to and activities for the immediate social environment (in societies, churches etc.) and to society as a whole (e.g. increasingly in NGOs).



3

Less-educated help each other in “background subsistence networks”

Low skills – high community involvement

Yet, the societal situation is far from rosy: Even in the project economy, no more than a minority of younger people have made it to higher social strata, nor are the majority of older citizens integrated into working life today as outlined.

In both cases insufficient education and skills have proved the key stumbling block. Many of these people today are obliged to organise themselves into self-help “subsistence networks”. Those that can no longer afford electricians or plumbers must help one another. In parallel, in the grey area between the official market and reciprocal free help, the shadow economy is blossoming.

Polarised political commitment

Disenchantment with politics beneath the middle classes...

The enormous social pressure has led to widespread disenchantment with politics among those parts of the population beneath the middle classes. Particularly in not very prosperous regions and metropolitan areas, radicalisation tendencies are apparent. In addition to these isolated, radical forms of political mobilisation, there are various types of new grass root movements. But unlike earlier new social movements, these are often no longer

...but society is also being shaken up...



mass trends, owing to the progressive fragmentation³⁴ of society. Instead, these campaigns focus closely on their members' needs and interests thus contributing to even more fragmentation. However, active commitment to greater redistribution on a local basis, to consumer protection, better education opportunities, improving older people's status and to more cultural integration energises societal discourses.

... and high earners have a new notion of elites

Affluent people are now playing a vital role in society with their philanthropic and civic engagement. They live up to their social responsibilities far more than 15 years ago. Thereby, they are helping to alter the notion and self-conception of elites. Nowadays elites organise their interactions partly through new, often international networks extending far beyond traditional family and professional functional affinities. Again, it is often education and learning experiences that decide on access to these networks – graduation from one of the top public or private German universities that have since made a name for themselves internationally is increasingly acting as an admission ticket, alongside a degree from an established foreign alma mater.

Winners of the knowledge society bring influence to bear on politics

Closer cooperation between state and citizens

It is through these social networks that many people who have become successful in the knowledge society exert influence on political discourses, in concerted form and across a wider front. Visible signs of this are increasing changes in the upper echelons between science, business and politics, the further growth in private consultants' influence on political strategies and decisions and new forms of lobbying³⁵. In recent years this influence has led to more intensive assessment of the achievements and the efficiency of administrative activity by the media in general by interested groups in society. This in turn has greatly helped make the "business of politics" more professional.

NGOs foster broadening of the term elites

The influence of non-governmental organisations, or NGOs, on national and international politics has also increased. While the well educated carry the greatest clout here, too, in general the new social movements recruit their members from all strata of society. Many older people in particular have discovered a new arena for activity there. And the growth in the NGOs' power has in fact helped expand our concept of the term "elite". Nowadays key NGO protagonists often enjoy high social esteem and have access to the leading scientific, business and political circles – giving them a say in "Expedition Deutschland".

Consumers better informed and more highly organised

Consumers learn from consumers

Additionally, a sustained change has taken place in consumer behaviour across all social strata.³⁶ Far greater numbers of consumers than 15 years ago are informing themselves and forming communities, often based on online or mobile platforms. They discuss the merits and downsides of specific products or services, make suggestions and reward useful contributions with social status and opinion leadership in the community. This was already evident in rudimentary form around the turn of the century, partly even on

³⁴ Rollwagen, Ingo (2007): Tracing the Future of Consumption: The Fragmentation of Societies and its Implications for Business Strategies. Presentation. Deutsche Bank Research (www.dbresearch.de).

³⁵ E.g. more intensive use of scientifically grounded indicators to underpin the interests represented and the grouping of large numbers of stakeholders (also individuals) with similar interests through new media channels.

³⁶ Rollwagen, Ingo (2007), op. cit.

retailers' own websites. (It comes as no surprise that marketing strategists have discovered a new field of activity in these communities.)

Consumer protection stepped up

This behaviour has been encouraged by falling transaction costs resulting from simplified and cheaper communication, by stronger state-induced consumer protection and by a marked – although temporary – increase in product piracy and online fraud. This has worked to the advantage not only of consumers, but also of operators of such community platforms, professional product evaluators and, of course, companies looking to premium product quality and reliability in their customer relations.

New consumer sophistication and sovereignty depend on level of education

Although the new sophistication and sovereignty of consumers can be observed throughout the population, both increase with the level of education. These days suppliers of goods and services therefore not only have to address better informed customers adequately, they must also still be able to communicate the benefits of their offers to a less sovereign audience. This calls for a differentiation of products, avenues of communication, ways of customer addressing and skills on the part of sales staff.

Germany is lead market for transgenerational products

Among the sovereign consumers are an increasing number of elderly people – not least because many of them now, in 2020, can easily find their way around interactive information media. Also, the older generation (still) has strong purchasing power. More and more suppliers now therefore closely consider older people's needs when designing their goods and services³⁷. In fact, Germany has become one of the lead markets for transgenerational products (suitable for young and old alike). Germany sets trends and exports these products successfully worldwide, chiefly to the United States. Its only competitor of note is Japan.

Income distribution widening further

And finally, like the spectrum of consumer sovereignty, so the distribution of incomes in Germany has widened further. In the expanding services sectors, too, this has given rise to growing demand for offers in broad price ranges (e.g. on the healthcare market, in social services and on the education market). An added challenge for marketing departments is that more consumers are deliberately breaking out of the patterns of consumption typical of their social stratum and milieu.

³⁷ Schaffnit-Chatterjee, Claire (2007). How will senior Germans spend their money? The interplay of demography, growth and changing preferences. Current Issues, Demography Special. Deutsche Bank Research.

Politico-legal framework in 2020

The gradual dissolution of encrusted structures – towards cooperative, learning regulation



“EU membership light”

Variety of options for European cooperation

In the year 2020 Europe has become an “open gravitation area”. While membership of the European Monetary Union has continued to grow, the EU itself – following its largely successful enlargement at the beginning of the millennium – has entered a path of consolidation regarding integration. A convincing concept below the level of full EU membership links the countries on the fringes of Europe economically and politically to the EU. Those member states wanting closer integration have taken advantage of the scope to deepen their cooperation.

Germany is part of the EU core group

Germany perceives itself in the year 2020 as a part of this vanguard, which in many respects is bound by closer ties than with the remaining member states. Generally speaking, the division of responsibilities between the EU and national governments follows more closely the principle of subsidiarity than 15 years ago in many, but certainly not in all policy areas. Cooperation among national governments and between them and EU institutions has become much more efficient, due in no small measure to agreement, at second attempt, on a reformed EU Treaty. Although this falls short of what the original proponents of a European Constitution would have liked to see, it has produced important institutional reforms.

“Smartly distributed public governance” – redefinition of state tasks

The state delegates and co-regulates

Efficiency is also the order of the day in political task sharing within Germany. The scope for fiscal policy was narrow even at the turn of the millennium, but in the following two decades it has been restricted far more – partly due to the ageing of German society – despite the odd temporary cyclical improvement. This has compelled government to redefine its tasks, to handle state intervention and the provision of services by public actors more restrictively, yet smartly. As a result tasks are increasingly being assigned to numerous agencies, civil-society-based quasi-agencies, non-profit organizations and foundations, advocacy groups, citizens and sometimes even corporations. In this new, distributed public governance scheme, citizens are obliged to assume greater personal responsibility. The most egregious examples are Germany’s public healthcare and pension systems. Both have been slimmed down to basic services; any provision going beyond this must be arranged privately.

Coherence in politics – from confrontational to cooperative compromise

The business of politics often seems difficult to comprehend. The distinction made in political science between institutions (*polity*), compromise-forming processes (*politics*) and political programmes of action and decisions (*policy*) helps to understand in more detail the core dynamic “shaping the politico-legal framework”.

Political science assumes that policies pass through typical stages. The media, associations and parties first pick up on an issue, set an agenda and in so doing define it as a political problem. Debate then ensues – generally in a confrontational manner – on objectives and what form political projects are to take, from which a policy is formulated by way of compromise. The policy is voted on and the administration implements the decisions taken. After a certain time the outcome of a policy is evaluated, prompting politicians either to reformulate it or to end the policy cycle.

In 2007 the Germans often had a sense of being caught on a seemingly never-ending treadmill. Political processes were constantly revisited – no compromise and no decision seemed to have much permanency. But by 2020 more collaboration on compromises, more active, moderated discussion rather than conflicts over agenda, altered administrative procedures and better structured cooperation between institutions have given form to political processes and made the treadmill less arduous. Once completed, political processes are not constantly reopened, making political decisions more transparent, reliable, accessible and easier to implement – in short more coherent.

Sources: *Héritier 1993, Schubert/Bandelow 2003*

Co-regulation makes government activity more transparent

In the regulation of product and labour markets, too, since the beginning of the second decade German government has increasingly favoured a cooperative approach, which goes by the term co-regulation. Of course, government still decides on regulation, but in the run-up citizens and corporates are increasingly involved in the development of new regulations, and the routine is a practised one. For one thing, this approach has broadened the knowledge/experience base for decision-making – a necessity these days given the increasing complexity of the issues that have to be regulated. For another, co-regulation has considerably heightened the transparency and predictability of government activity and regulation for the populace and the business community, significantly reducing their information costs.

Companies recognise standard-setting as pivotal competitive factor

More and more German companies are now also playing an active part in standardisation below the level of national and supranational regulation (mainly intra-industry standards and norms). They have realised that they can make active use of standard-setting as a competitive factor by designing standards – in so far as this is possible in consensual processes with competitors – in their area of competence. In the next step they try to gain acceptance for these standards on international markets. One example is widespread and successful standardisation in environmental engineering (pollutant filter types and qualities, solar panel sizes etc.³⁸). These active standard-setting practices are increasingly becoming a prerequisite to success in global competition.

New model regulations for intellectual property**European regulation of intellectual property more innovation friendly**

It was also the German co-regulation model that provided Europe in the first decade with an intellectual property regime that has fostered innovation on a sustainable basis. The old protection model for

³⁸ See Heng, Stefan (2007). Harmonisation of the communications industry between the EU and US. In B. Böttcher and K. Deutsch (eds.): From free trade to deep integration. Outlook on economic relations between the EU and US, EU Monitor 45, pp. 34-36. Deutsche Bank Research.

these assets – which are so important in a knowledge economy – no longer seemed adequate.

Patent issuance was a long-drawn-out process and the patent terms and mechanisms were the same for all technology areas. But the pace of knowledge production in research and technology was increasing and its forms becoming more volatile, cooperative and open (an early example being Open Source Software). Copyright also had nothing better to offer than a one-size-fits-all-solution, while cultural production and distribution was growing dramatically cheaper and as a result more varied. This encouraged niche offers in preference to the mainstream.

Following a long-fought battle between the various interest groups, a new welfare-benefiting balance was found for these areas between the possibility of speedy diffusion of new knowledge in society on the one hand and the incentive to innovate offered by the protection of intellectual property on the other (faster and shorter protection in selected technology areas, a ban on patenting evolutionary genes etc.). Together, state agencies and German companies also devised framework conditions for the protection and exploitation of intellectual property contributed to projects or developed during project work. Both advances have served as a model for the relevant European regulation.

European regulation of intellectual property as an international model

And not just for Europe: around 2015 some important aspects were actually integrated into international World Intellectual Property Organisation (WIPO) agreements. This came about in no small measure as increasing R&D activities by emerging markets themselves made the idea of global protection for their own intellectual property more attractive. (The first move for a settlement in 2009 failed, but comprehensive harmonisation is now in prospect for 2021). Unfortunately, however, these new rules – as with other international harmonisation including that on the general security of foreign investment – cannot yet be enforced adequately in many countries.

Weak signals of better interaction between state and citizenry – even in 2007

In most OECD countries governments and public administrations are beginning to measure and assess their performance more precisely. In particular the development of legislation and the quality of standard setting are being improved. Legislative processes are becoming more open. An important trend is better information for citizens: in 2004 90% of the OECD countries enshrined information rights for citizens into law.

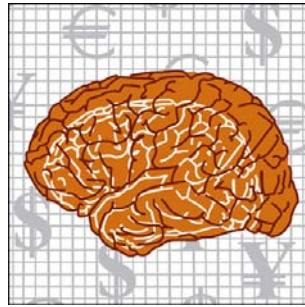
An appreciation for people's concerns and the mediation of disputes by ombudsmen is also widespread in 2006 in 90% of the OECD countries. Lists of laws to be drafted, modified or amended in the foreseeable future are published. And quality management is established in standard setting. Many countries have introduced fixed consultation periods, for example, within which individuals and interest groups can have their say on planned legislation. In addition, in countries such as Denmark standards for administrative procedures increase transparency.

What is more, in 2005 two-thirds of all OECD countries introduced a formal commitment to Regulatory Impact Assessment (RIA), often with particular regard to small and medium-sized businesses and social groups. Programmes to simplify and remove bureaucracy existed in 2005 in 25 countries. These and other measures have improved the interaction between governments and citizens by 2007 already. The amendment with quantitative targets has given them additional bite. Paper tigers are now being given claws with quantitative targets, even if these and similar measures have been already improving interaction between government and citizens in 2007.

Source: OECD 2007

Intellectual capital in 2020

Modular education and trade in valued knowledge



Efficient protection of intellectual capital is a good thing – but there has to be something to protect, and education is the bedrock for this. Efficient learning and broad education did not just form the basis for emergence of the project economy; for years education has also increasingly contributed to a fragmentation in society.

Crowded private learning markets

Nowadays “learning” is a central, shaping element of German society and it is traded on structured and efficient markets. The market for learning services has become one of the most expansive sectors of the German economy, with demand rising fast and constantly. Private providers have contributed enormously to this by learning to perceive themselves, far more than just 15 years ago, as true service providers. Their range of services encompasses both services to impart knowledge by instruction (primary learning market) and learning support services such as the production of learning materials and aids, study trips or counselling and coaching for better learning (secondary learning market).

What is more, their education and training offers are modularised. Often products from different providers can be combined into target-oriented learning and training paths with a wide variety of variation possibilities meeting the requirements and aptitudes of individuals.³⁹ Seminars for one or more days or sabbaticals lasting several months supplement ongoing internet-based learning. More and more individuals acquire these learning modules throughout the course of their entire careers and lives, frequently in a systematic way. Increasingly standardised indicators and ratings, international comparisons and broadly recognised certification and accreditation have made learning far more transparent to consumers as a service despite the growth in supply and in the number of suppliers. Moreover, employers can better assess their employees’ qualifications.

Public universities going strong

Some of these private learning offerings are complementary, some in competition with public education. A wave of consolidation at the beginning of the millennium saw a lot of educational institutions merge or quite simply shut down. At that time many universities focused on

Providers operate with customised learning services on efficient markets

Learning modules are combined into lifelong learning strings (“learning chains, not only certificate gains”)

Public universities reorganised and more efficient

³⁹ For one thing, universities have expanded their cooperation with dual vocational training institutions and developed advanced scientific training modules. This has helped many skilled workers with qualifications from the dual system “only”, who were especially hard hit by the declining relevance of manufacturing. They were able to obtain qualifications for the newly emerging services professions or set up their own companies offering person-based services.

their specialist national and often international comparative advantages, building brands on their beefed-up profiles. Others now concentrate on basic tertiary education. They put particular emphasis on learning to learn competencies.

Strong brands in the learning market

In addition, university tuition fees were introduced Germany-wide in 2012. This, in conjunction with the individual institutions' focus on competition and their specialist strengths, has resulted in most of Germany's public universities being more efficiently run and better equipped than they were ten years ago. In primary and secondary education, too, evaluation and other initiatives have improved schools, the quality of teaching and the interplay between schools, parents and local businesses.

German tertiary education attractive to German and foreign students

Popular with education consumers near and far

And so the slow but steady rise in state spending on education for almost 15 years now is falling on increasingly fertile ground. Gradually, too, public expenditure on education counselling is bearing first fruits as the numbers of school and university drop-outs decline and polls reveal high student satisfaction. Graduate satisfaction is due partly to the far greater scope that university studies now give to training soft skills such as intercultural competencies, project and conflict management or "learning to learn". All these competencies are in growing demand in the present-day globalised economy.

Highly skilled workers still in short supply

In fact, as a result of these developments a high international market value is now placed again on German university education and vocational and scientific training. More and more talent from abroad is coming to Germany despite the in some cases hefty fees for tertiary education. However, this "brain gain" is still far from sufficient. Highly skilled personnel, particularly graduates in mathematical, science and technical studies (MST), are still in short supply in Germany. But since MST graduates are an important pillar of German economic growth and demographic trends mean that supplies of young labour are running short- there is still need for further action.

Players in new "knowledge industries" drive project economy

The new data and knowledge markets

Like many other countries, Germany now handles the knowledge generated by its new bright minds in science and industry more systematically and efficiently than 15 years ago. Data, information and knowledge are now validated, efficiently managed, valued monetarily or by other measures, legally protected (in the form of the new copyrights and patents) – and, finally, traded on increasingly liquid markets to a far greater extent than in 2007. These developments have prompted companies to view in-house knowledge more in opportunity terms. This creates added incentives to identify ways of turning their intellectual capital to profitable use and, by so doing, to increase its value.

All these intellectual capital-related competencies have given rise to new sectors, whose members play key roles in present-day value creation processes. With knowledge as the central "means of production" and many stakeholders with different knowledge inputs (such as customer knowledge, technical knowledge, process knowledge etc.) involved in a project, demand for efficient treatment of knowledge is high.

Digitisation in 2020

Networked goods and the new internet



Database networking important for the project economy

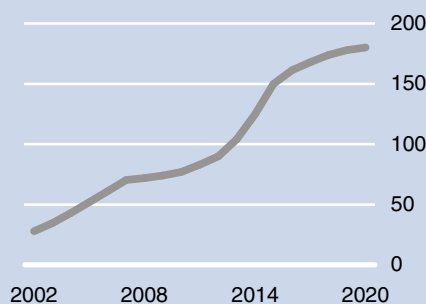
In addition to intellectual capital, technological support on various fronts also proved absolutely vital to efficient cooperation in flexible, often temporary projects. Uncomplicated and secure database networking became one key factor of success, be it to exchange data on customers or on construction plans. Standardisation of the relevant IT interfaces (hardware, data formats, Web services⁴⁰) emerged as imperative, and as from 2010 rapid progress was made on this.

New man-machine interfaces support global project teams

Also, the teams of specialists involved in a project are increasingly geographically dispersed. Particularly in R&D, this can cause communication problems given the complexity of the data and visualisation-based work methods. This is where new man-machine interfaces (MMI) now come in, helping developers from different continents to work together simultaneously on the same three-dimensional object in virtual collaborative environments, for instance.

Simulation gets real

World sales of simulation technology, in EUR bn



Sources: CyberEdge Information Services, Deutsche Bank Research

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But even when staff are not separated geographically, these visualisation methods – which belong to the family of virtual reality or augmented/mixed reality systems – are now being used more often (e.g. to portray complex geological datasets in the oil industry, to expedite and cut the costs of product development and architecture and to help with surgical procedures).

Networked goods flows

For projects geared heavily to the production or distribution of goods, the gradual spread of radio frequency identification tags (RFID tags) on goods as from 2010 proved an absolute boon. If they are to be efficient, these projects must be able to monitor the complex logistical chains between all the players involved down to the last item, cheaply and worldwide. In the early years, however, RFID chips were slow to catch on owing to the still-high costs and consumers' data protection concerns, notably at the point of sale. It was not until the middle of the second decade that their diffusion gathered pace.⁴¹

RFID chips enable automatic tracking of individual goods

Today, in 2020, a significant proportion of goods traded internationally are equipped with RFID tags. The goods can thus be identified automatically and touch-free – and hence tracked on the “internet of things”. (Of course, RFID tags can carry more than just

⁴⁰ See Heng, Stefan (2005). Software houses: Changing from product vendors into solution providers. E-conomics 50. Deutsche Bank Research.

⁴¹ See Heng, Stefan (2006). RFID chips: Future technology on everyone's lips. E-conomics 55. Deutsche Bank Research.

Many information and communication technologies have reached maturity	the object's ID). This electronic networking of goods, together with the standardisation of database interfaces outlined above, has significantly reduced transaction costs in broadly branched value creation processes skewed heavily to goods.
Type of transmission channel becoming less important to the user	All these are illustrations of the general productivity gains achieved through the use of information and communication technologies (ICT) in recent years. Over the past two decades the application of many of these technologies has reached maturity. The technologies and their application have become more reliable and efficient.
Network convergence an early illustration of project-centric activity	<p><i>Transmission channels growing together</i></p> <p>At the same time, the network infrastructures on which these technologies sit have changed, helping further boost productivity. On the one hand we are seeing greater convergence between the infrastructures of fixed telephony, mobile telephony, the internet and television. Large parts of telephony and television are now transmitted via internet protocols. Where convergence is not yet quite so advanced, intelligent end-user devices that speak the "languages and dialects" of nearly all common infrastructures help out ("always best connected" principle).⁴²</p> <p>This convergence of infrastructures that were essentially still separate around the turn of the millennium now makes life easier not only for the particularly mobile among the working population – it also reduces infrastructure costs. Particularly at the early "experimental stage" much of the cooperation necessary for this convergence of networks and end devices was organised by the various stakeholders in project form to guarantee the desired flexibility.</p>
Internet's DNA enhanced by new governance and security structures	<p><i>A smarter internet</i></p> <p>Moreover, a creeping but revolutionary transformation – hardly noticed by the public at large to begin with – is taking place in the internet itself. Increasingly sophisticated protective mechanisms (including digital signatures and more resistant operating systems) have been put in place over the past 15 years to combat the proliferation of viruses, spam emails and criminal activity on the internet in general. Still, calls have grown ever louder for root-and-branch reform of the way the internet works to elevate it to an "intelligent" network that prevents viruses, spam and other undesirable web traffic from occurring in the first place.</p> <p>What is more, some emerging markets and various developed countries had increasingly called US dominance in internet governance into question. After a string of fruitless international attempts to reach a settlement, representatives of governments, the business community and civil society finally agreed in 2012 to change the internet infrastructure gradually and to place web governance in the hands of an international body. This conversion process is still far from complete. But even the initial innovations have perceptibly increased network security in some areas. These days it is far more difficult, for instance, to "hijack" a large number of computers and mount joint attacks on the IT nerve centres of big organisations.</p>

⁴² See Stobbe, Antje and Tobias Just (2006). IT, telecoms & New Media: The dawn of technological convergence. E-economics 56. Deutsche Bank Research.

Energy supply in 2020

Broad energy mix, decentrally produced



Towards a broad energy mix...

Oil and gas prices drive investment in renewable energies...

The prices for fossil fuels, particularly oil and gas, have continued their sharp rise which started at the beginning of the millennium. By the end of the first decade it was generally accepted that this trend was practically irreversible. That, and heightened public discussion on global climate change, drove the development of new energy-saving technologies and gave new energy-saving/counselling service providers a powerful lift. It also triggered more investment in research on and the use of alternative sources of energy by government, business and private individuals.

... and wind energy is now competitive – without subsidisation

In the middle of the second decade wind energy, which had been massively subsidised in Germany for many years, became price-competitive with coal and natural gas even without government funding. This milestone was much-feted in the media and further improved the investment climate. Solar energy is also becoming increasingly competitive in Germany and on many other markets.

From farmer to “energy farmer”

Manufacturers of wind power plants, like so-called ‘energy farmers’, have benefited enormously since then. These innovative farmers produce renewable raw materials for conversion into fuel. They leave the processing and distribution of their products to specialists (with whom some energy farmers have set up successful special purpose vehicles).

Extension of remaining operational lifetimes for German nuclear power plants

But in addition the outlook has brightened again for coal and nuclear power. Coal benefits from the far lower emission levels of today’s power plants⁴³, and following intensive political debate the newer nuclear power stations’ remaining operational lifetimes have been extended. (Even so, nuclear’s share of German primary energy consumption was halved between 2005 and 2020.) Major energy-saving effects in all segments of the energy chain and the ongoing dynamic development of renewables, together with extension of the remaining lifetimes for power plants, guarantee secure energy supply in Germany. Furthermore, the EU has met its 2007-set target of a 20% reduction in carbon dioxide emissions by 2020 – with Germany accounting for the lion’s share.

... and decentralised energy generation

Renewables the main driver of decentralised power generation

All in all, these developments have given rise to a broad mix of energy sources, which is currently shifting slowly but surely further towards renewable energies. But besides this diversification in energy supply, rising oil and gas prices have sparked another trend

⁴³ Auer, Josef (2007). Technology to clean up coal for the post-oil era. Current Issues, Energy Special. Deutsche Bank Research.

– the decentralisation of energy generation. This automatically increases with the proportion of biomass, wind and solar energy. Since these forms of energy generation require a lot of space, a widespread geographic distribution is inevitable. In addition, small power stations serving only one residential area or district have shown to be economically efficient.

**Decentralised generation coordinated
by “energy internet”**

To orchestrate this plethora of new, decentralised power generators efficiently (balancing out local shortages, demand-adjusted payments feed-ins etc.), in the past few years a supra-regional “energy internet” has emerged from an initial patchwork of incompatible, regional power generation and distribution control networks. So ultimately diversification, decentralisation and supra-regional coordination have significantly enhanced the security of energy supply.

**Energy market fosters mentality
change in credit risk assessment**

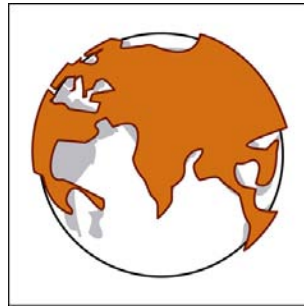
Energy sector fosters project economy

Many of the new wind parks and power stations were built up in projects requiring substantial financing and entailing considerable risk. It is true that their initiators and financial backers counted on oil and gas prices to continue heading north; all the same, the residual exposure was not inconsiderable. Nonetheless, banks and the capital market – infected by the lasting euphoria on the energy market – put up substantial debt and equity capital, although debt-based project financing is generally not without its complications.

So the attractiveness of the energy market helped foster a gradual mentality change in credit risk assessment at the beginning of the second decade in the banking sector. Tangible collateral (which passes to the lender in the event that the borrower defaults on the loan) took a back seat to even more detailed cash flow forecasts (that help assess the *probability* of default). This way, developments in the energy sector were an engine of the project economy, where tangible security has become rare owing to the structure of the projects as such and their high knowledge intensity.

Global integration in 2020

Boom in German creativity exports



Rise of the “bamboo countries” has changed Germany’s global integration



The massive internal structural change that Germany has initiated and experienced in the past 15 years was fueled by developments whose epicentre lay or lies far outside Germany in some cases. An example often cited today, in 2020, is the rise of China and India and of countries such as Malaysia, Thailand and South Korea. Their ascent – notwithstanding some temporary setbacks – was almost comet-like for many years. (Today these countries, proud of their rapid growth and Asian identity alike, dub themselves *bamboo countries*.) As well as reshaping Germany’s internal structures, these developments have also changed the character of the country’s economic, political and social integration with the rest of the world.

“Created in Germany”

Germany actually surrendered the title of world champion in merchandise exports to China as far back as 2009. The rate of expansion in such traditionally strong German high-tech shipments as automobiles, machinery and chemicals has long lagged that of its exports of services.

For that Germany has seen steep growth, albeit from a considerably lower level, in exports of “cutting-edge technology” (microsystems, a broad spectrum of environmental engineering products, biotechnology etc.) and virtual goods such as software, patents and licences, music, films and computer games (see also Figure 5). Among Germany’s computer game developers there are even some world market leaders in their “niche”. (And the market is a big one. As early as 2001 the important US market for computer games topped US cinema box office sales and has since enjoyed stellar growth.) Nonetheless, the share of merchandise in German exports, which still accounted for around 85% 15 years ago, now stands at barely more than 75%.

The remaining quarter consists of services. These days, German providers of knowledge-intensive services are particularly successful exporters. In the project economy they are like a fish in water, additionally benefiting from the experience and networks built up by the former world champion of merchandise exports. Creative and creative-support service operators (from the fields of R&D, design, information design, foresight, ethnography, organisational design etc.) are a pivotal engine of this new export boom. They have skilfully succeeded in condensing the virtues traditionally ascribed to the Germans by other countries – artistic curiosity, systematic research and experimenting as well as “tinkering until they get it right”, together with intelligent and functional design – into an export-

Cutting-edge technologies and...

... creative services – the new German export hits

Old virtues put to new use – German “service tinkering”



boosting image: *Created in Germany* is often the label of choice today, particularly in Asia and the Middle East.⁴⁴

Fascinated by Germany's innovators

Bamboo countries invest in German customers, innovators and brands

Along with their exports, German services companies – like those in the other “*vieux riches*” countries US, Japan etc. – have also further massively increased their foreign direct investments in the bamboo countries and other (former) emerging markets in recent years. Their investment targets have also included East European and CIS countries.^{45,46} But more remarkably, the bamboo countries are now investing heavily in Germany and other “*vieux-riche*”) economies. Popular investment targets in Germany are local market research agencies and companies with extensive databases on local customers – as a means of smoothing the way to consumers with sophisticated demands. In addition, the bamboo countries are investing in established German consumer goods and services brands (brand development, often an arduous process, is not yet one of their core competences) and on local R&D capacities.⁴⁷

Petrodollars buy into the club of innovative countries

Aside from the bamboo countries, two other world regions in particular have identified German innovation capacities as an exciting investment target. US private equity funds, for which Germany was an investor's paradise up to 2009 with its undervalued SME companies and big corporations, came up trumps in their search for new, high-return (and risky) asset classes with innovation-intensive special purpose vehicles. The US funds may have pioneered this new form of investment, but it was not long in attracting the petrodollars of the Middle East to Germany. Many oil-rich Arab countries embarked betimes on structural change away from oil production. With private and public funds they bought access to innovative technologies and service ideas – often in Germany.

Into Africa

And where does German “public FDI”, formerly known as “development aid”, now flow? Up to 2010 the bamboo countries were still among the recipients of the German taxpayers' money. Subsequently, however, these funds were increasingly redirected to Africa – supporting the development of local human capital, mainly in the northern part of the continent. German politicians realised early on that more investment on education for young Africans would improve the educational background of some of the people later immigrating to Germany. Also, Africa is now an attractive offshoring destination.⁴⁸ Germany's timely investment not only helped raise the level of education of the local workers who did not emigrate (from which, of course, Germany's offshorers are now not the only ones to reap the rewards – a classic illustration of spill-over); it has also opened the door to German companies as welcome employers and business partners.

⁴⁴ Prof. Dr. W. Wahlster, director of the German Research Center for Artificial Intelligence at that time, was one of the first to popularise the new brand *Created in Germany* – no less than 16 years ago.

⁴⁵ Commonwealth of Independent States, organisation of successor states to the Soviet Union.

⁴⁶ Nestmann, Thorsten (2007). Russia's financial sector: Financial deepening will support long-term growth. Current Issues. Deutsche Bank Research.

⁴⁷ See Neuhaus, Marco (2006). Inshoring to Germany: Global networking is not a one-way street. Current Issues. Deutsche Bank Research.

⁴⁸ See Mühlberger, Marion (2007). Op. cit.

Telecooperation has matured, ...***Multinational projects, with local and virtual roots***

But trade and capital flows are now not alone in networking Germany even more closely with other countries than at the turn of the millennium. The project-like organisation of many parts of value creation in Germany (and elsewhere) is similarly conducive to networking. Participants in a project frequently come together from different countries, either physically in one place or virtually via new information and communications technologies. Although the latter form of “telecooperation” has not yet reached full maturity, it is already considerably more efficacious than 20 years ago.⁴⁹

... but collaboration in local clusters is still important

Often, the impetus for new projects in Germany comes from abroad (notably America and Asia, but also from the Middle East). As with foreign direct investment, access to German customers and innovation capacities is frequently the motivation for collaboration. But for all the relevance of internationality, local networking – usually within a regional cluster – is still a decisive factor of success in value creation processes.

Germany international political impulse generator – in project law...***Political world middleweight champion***

Notwithstanding its positive economic development, these days Germany is not a heavyweight on the world political stage. The big newcomers China, India and partly Russia, too, have attracted too much of the international audience’s attention for that. But over the past 15 years Germany has established itself as a political player with foresight, starting and sustaining initiatives on a global basis. For one thing, the German government – with the prospering project economy behind it – has been able to set agendas and bring in proposals in international trade organisations for more standardised and more adequate legal and taxation frameworks for project entities.

... and in innovation- and development-fostering regulation of intellectual property

For another, Germany managed, with the example of the broad and sustainable innovation-promoting regulation of intellectual property that it put in place in the first decade, to soften up the obstinately rigid fronts that had formed in the World Intellectual Property Organisation (WIPO). In certain areas both the developed nations and the then emerging markets were convinced by practical examples of success that had benefited from a balanced blend of inventor protection and knowledge diffusion. These intellectual property regimes facilitated the transfer of technology to emerging markets – an increasingly urgent issue amid the greater incidence of epidemics and more acute climate change. On the other hand, this new balance has also lent fresh impetus to innovation cooperations within the developed countries. (An illustration of the latter was the successful R&D race of European automotive manufacturers to catch up with their Asian competitors’ achievements in alternative engine / power train systems. Back in 2009 many observers believed Europeans had already lost this race⁵⁰).

⁴⁹ Heng, Stefan (2004). Standortwahl in einer zunehmend vernetzten Welt – Evolution statt Revolution. In: Räumlicher Strukturwandel im Zeitalter des Internets – Neue Herausforderungen für Raumordnung und Stadtentwicklung, pp. 169-186. Wüstenrot Stiftung.

⁵⁰ However, European carmakers managed to claw their way back again, due in no small measure to bold collaborative projects with innovative patent agreements and the offer of various innovation awards in open competition. In the course of these collaborations they partially opened their innovation process to the specialist community.

Close strangers and distant acquaintances**Wanted: Low- and highly-skilled immigrants**

Finally, the Germans have also grown more international in personal affairs. Certainly, the social integration of immigrants in German society is still no easy task – especially beneath the middle class, where many Germans and immigrants (particularly low-skilled) are under enormous pressure. However, broader sections of the German middle and upper classes have got the message that Germany urgently needs both low-skilled and highly-skilled immigrants.

More personal international networking

In addition, the Germans are now more personally entrenched in networked with people from other countries and continents. Around the turn of the millennium the scientific and business elites in particular were already globally networked, both professionally and privately. But over the past two decades networking of individuals has expanded in three dimensions. First, there is now an even broader spectrum of communities than in 2007. Often internet-based, they bring together people with shared interests the world over. Some are forums for an informal exchange of ideas, others are professional communities of practice.

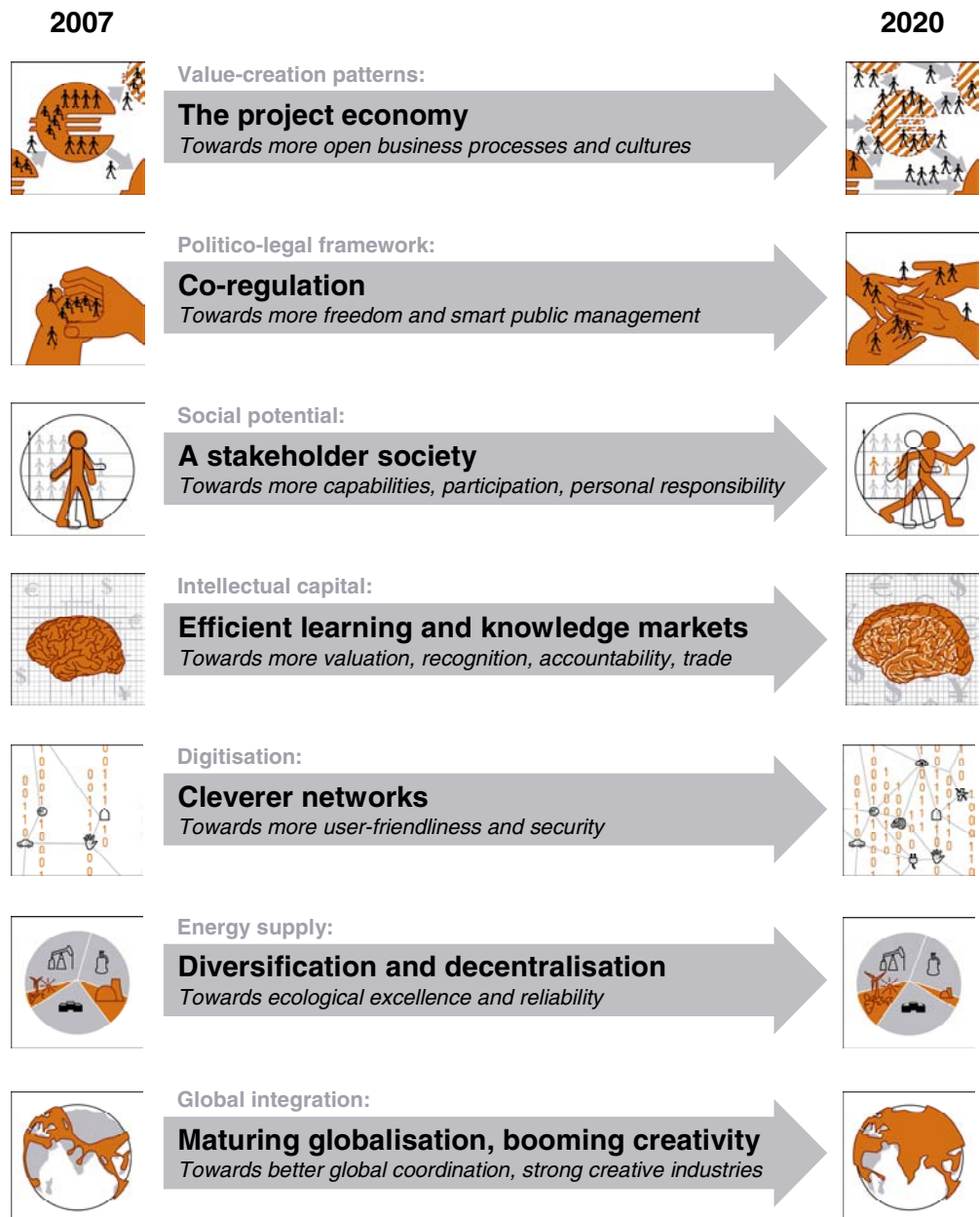
Birds of a feather flock together: communities increasingly popular...

Second, these networks are no longer the exclusive province of the knowledge elites. Skilled German workers in the knowledge economy are also beginning to benefit from the experience of their peers in South Korea (admittedly, sometimes with the help of electronic translation). And third, this networking has expanded geographically as more and more countries and regions are hooked up to electronic media.

... and deliver ideas for new projects

Which brings us round full circle. Professional and private contacts of this kind have given rise in latter years to many ideas and stimuli for new projects – large and small, in Germany and elsewhere, local and international. The project economy – indeed the whole “Expedition Deutschland” – revolves around the individual’s cooperative commitment and ability. Pars pro toto.

Germany's structural change in a nutshell



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Bottom line: moderate growth

Depending on one's perspective, our "Expedition Deutschland" scenario paints an exciting, strenuous or even disturbing picture of life and business in Germany in the year 2020. But, whatever the perspective, it also describes an economic, social and political situation in Germany which is reached not by "more (or less) of the same" but only by sustained and, in some cases, radical structural change.

Despite massive structural change only moderate growth of 1.5% per year through 2020

Despite the, on the whole, positive picture painted in the "Expedition Deutschland" scenario, particularly in economic respects, we expect that on the road to this scenario *Germany's gross domestic product will grow at an average annual rate of only 1.5%*.⁵¹ This figure looks low in view of the structural changes which the scenario sketches in

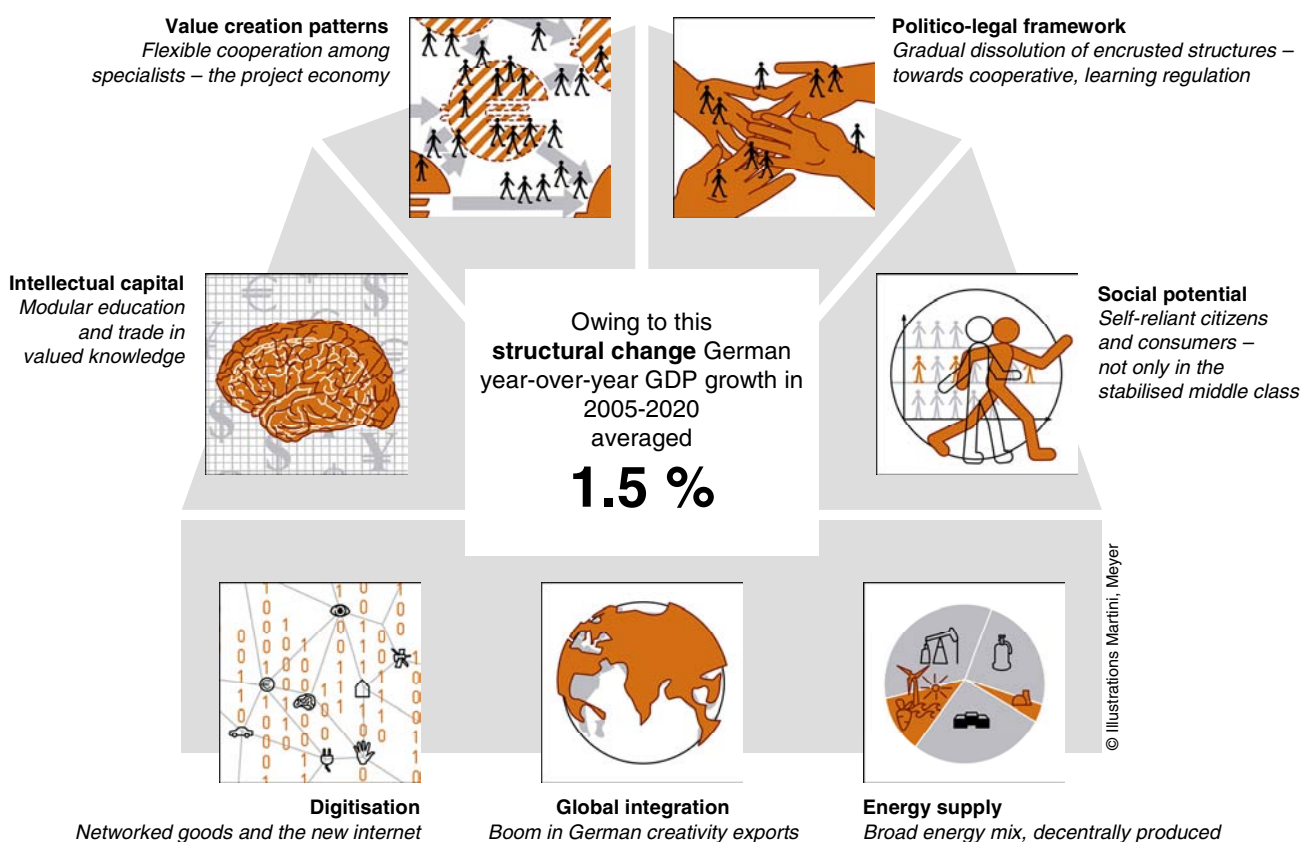
⁵¹ Growth also averaged 1.5% per year in the period 1992-2006.

so many areas of the economy and society. However, Germany will face massive demographic burdens and will feel the more tangible impact of global warming in the coming years. What's more, for years Germany has been tackling the necessary reforms only hesitantly. We are therefore convinced that Germany *can only achieve this moderate average growth of 1.5% per year through 2020 in the first place through such massive structural change.* (Still, this structural change will allow a slightly higher potential growth rate once the demographic burdens ease a little from 2025 onwards.)

Our forecast for the period through 2020 is supported by the results of our earlier project "Global Growth Centres 2020".⁵² In that study we had derived quantitative growth forecasts for 34 countries on the basis of a combination of an econometric growth model and qualitative trend analysis. Our "Expedition Deutschland" scenario and the underlying DBR dynamics map (see page 8 and the Appendix) match the assumptions of this previous project, elaborate on them in more detail and therefore make transparent the structural breaks and impacts of trends which we had factored into our analyses at that time.

A great deal of structural change, but modest growth

Average GDP growth through 2020 on the path to "Expedition Deutschland"



⁵² Bergheim, Stefan (2005), loc. cit.

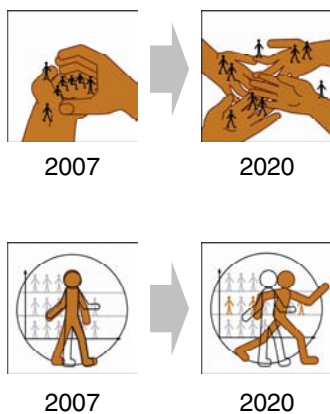
3. Scrutinising our scenario analysis – fast backward to 2007



Why the focus on this scenario?

The path to the “Expedition Deutschland” scenario is certainly not the path of least resistance considering the structural changes that have to be mastered on the way. All the same, we are convinced that this scenario is the most plausible of our four pictures of Germany’s mid-term future: A number of long-term trends which have an exceptionally strong influence and whose general future development can be predicted particularly reliably clearly point in the direction of “Expedition Deutschland“. All these trends are elements of the DBR dynamics map.⁵³

The main characteristics of our four scenarios – and hence the differences between them – emerge from the different developments of the two core dynamics underlying each scenario. In the following we will therefore discuss why the two core dynamics will probably tend to be driven by the reliably predictable trends to the top right field of our scenario matrix. To simplify matters, we will discuss each core dynamic separately.



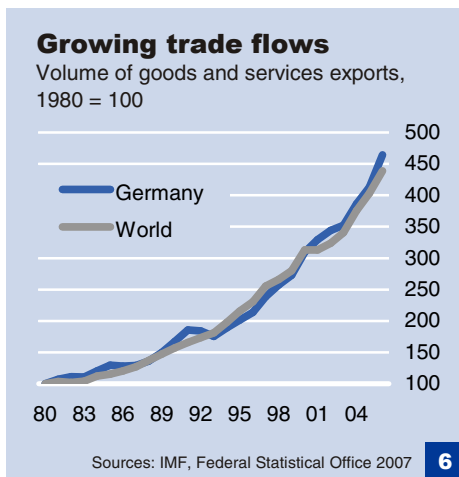
Towards coherent policy-making and committed citizens

The following trends drive the core dynamic “Shaping the politico-legal framework / Tapping the social potential” in the *coherent* direction (in other words towards stronger co-regulation by the state with citizens and the corporate sector; towards a stronger ceding of the state’s mandate to citizens and firms; and thus towards more self-reliant and committed citizens and consumers; see the figure *Why the focus on “Expedition Deutschland”?* on page 57).

— *Trend “Ageing population”*. The ageing of German society reduces the number of persons in employment in relation to the number of pensioners and therefore places a strain on public finances – both today in 2007 and in the coming decades.⁵⁴ To alleviate this cost pressure caused by demographics, policymakers need to shape the framework conditions in the labour market in such a way that older people can be integrated more intelligently into working life, thus working longer and more productively. However, a new regulatory framework of this kind appears unrealistic if citizens’ and companies’ knowledge and commitment are not tapped more strongly in the process in future. And the potential among citizens is considerable, too. The elderly especially are already involved today in local church work, in local politics, on development aid projects and in sports

⁵³ Partly whole “trend-like dynamics“, partly sub-elements of them (“trend-like drivers“); to simplify matters, both are referred to here as “trends“.

⁵⁴ Gräf, Bernhard (2003). German growth potential: facing the demographic challenge. Current Issues. Deutsche Bank Research.



6

clubs.⁵⁵ Moreover, the remaining (though slightly weaker) demographic pressure on the public purse despite co-regulation will still force government and public administration to cut their spending. Consequently, they will have to redefine their tasks and surrender some functions to citizens and enterprises (from child care, education, careers advice, employment agency services and healthcare through to nursing care for the elderly).

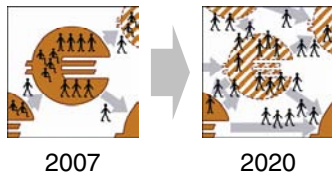
- *Trend “Globalisation”*. Cross-border flows of trade, capital and knowledge will continue to grow (for the historical development see Figure 6). This will intensify international competition to attract the best companies and brains. In this competitive environment countries can only succeed if they offer attractive framework conditions and continuously improve on them in future together with international business players.
- *Trend “Global climate change”*. Global climate change is a challenge of such proportions that it can only be mastered through further supranational cooperation. In the course of this cooperation new instruments will be developed and put to the test which subsequently help to improve the forms of – likewise urgently needed – cooperation at the national level. After all, government and the administration cannot make sufficiently large strides at the national level without the commitment and active participation of its citizens and firms; neither, conversely, can the latter without governments and the administration. So co-regulation is inevitable here already in the near future, especially in view of the raft of technical solutions which need to be assessed. Moreover, to mitigate climate change and its effects investments in R&D will be necessary – also in the coming years already – which will still not appear to be profitable enough for the private sector. Germany, too, will need to, and must have the will to, continue and even step up its efforts in this direction.⁵⁶ These investments will place a still greater strain on public finances. It will thus compel government and the public administration to redefine its tasks and to cede other functions to third sector organisations, citizens, and the private sector. Added public financial burdens can also arise in Germany through extreme weather conditions (e.g. floods) which become more probable as global climate change continues.
- *Trend “Energy shortage”*. Given the depletion of fossil fuels alternative (primary and secondary) energy sources need to be developed rapidly in the next two decades if energy supplies are not to become the bottleneck of economic growth. In addition, suitable, more energy-efficient machines, vehicles, aircraft, heating systems etc. are urgently needed. Government will have to continue to support the related business investments – for instance in wind power, solar energy, biofuels and hydrogen fuels – with subsidies to achieve the investment levels necessary from a welfare point of view (“market failure”). So this, too, will be an

⁵⁵ The proportion of “socially committed elderly persons“ over 60 years rose from 26% to 30% between 1999 and 2004; the proportion of socially committed younger senior citizens rose from 31% to 37%. See Bundesministerium für Familie, Senioren, Frauen und Jugend (2005). *Freiwilliges Engagement in Deutschland 1999-2004. Ergebnisse der repräsentativen Trenderhebung zu Ehrenamt, Freiwilligenarbeit und bürgerschaftlichem Engagement*. Conducted by TNS Infratest Sozialforschung, Munich.

⁵⁶ Some areas of environmental technology already have enough economic appeal to attract sufficient private R&D funding. Others have been identified by the public sector as forward-looking, socially desirable growth areas but are not as yet of interest for most firms.

added burden on the public purse which, in turn, will create a strong inducement for government and the administration to give up other functions in order to contain their expenditures.

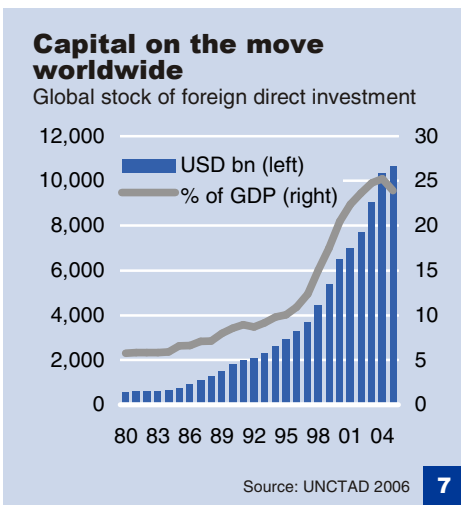
In our scenario matrix these four trends therefore drive Germany to the *right* (“coherent”, see the figure *Why the focus on “Expedition Deutschland”?*) in the coming years.



Towards a more open business culture

These and other reliably predictable trends will also drive our second core dynamic “Change in business culture and value creation patterns” in the *open* direction in the coming years (in other words, towards more intensive inter-firm collaboration in innovation and value creation generally; towards new and thus riskier technology and business areas; towards new forms of financing; see the figure *Why the focus on “Expedition Deutschland”?* on page 57).

- *Trend “Globalisation”*. The growth in international trade, capital and know-how flows is a reflection of the international division of labour which will continue to increase in the future (see Figure 7). Driven by more favourable factor prices or framework conditions and often enabled by new communication technologies, whole supply chains or product segments will continue to migrate from country to country, while firms will continue to outsource individual steps of their value-added processes to other countries (*offshoring*).⁵⁷ This means that the communication or cooperation that previously took place internally within the company before the outsourcing now has to take place increasingly between firms.
- *Trend “Growing strength of emerging markets”*. Much of this offshoring, which will continue to increase in future, is driven by the outsourcing of less complex steps in the value chain from the developed economies to emerging markets. In the future, developed economies’ comparative advantage will therefore have to lie even more than before in the knowledge-intensive, early phases of value creation: in R&D and innovation generally. Entry into new, riskier technology and business fields will move more to the fore in Germany and other developed economies as lucrative innovation successes become increasingly difficult in the established, mature fields.
- *Trend “Accelerated creation of knowledge”*. Innovation projects will also become increasingly complex and thus more costly and riskier in future. The reward systems in business and science – and people’s natural curiosity – are constantly accelerating the creation of new knowledge.⁵⁸ Driven by competition in the goods and services markets, this trend is persistently increasing the depth and breadth of the knowledge required to launch successful products in the marketplace. Besides technological know-how, this also includes knowledge drawn directly from basic research (in biotechnology for instance) as well as



⁵⁷ We believe the growth of this cross-border outsourcing (also called offshoring) is a trend that will also continue in the coming years (mostly in the services sector). Of course, many steps in companies’ internal process chains will be outsourced to other national companies as well. But it is difficult to say as yet whether further growth is likely here long term.

⁵⁸ Another driver is the tendency for science to use its knowledge to make its own creation of knowledge more efficient. A past example is the research into light amplification by the stimulated emission of radiation. This led in 1960 to the design of the first laser, which ushered in a new era of optical research into solid-state materials (e.g. superconductors), live cells etc.

knowledge of customer needs and specifics (from customised services through to pharmaceutical products for specific gene pools).⁵⁹ To spread the costs and risks, firms will take this knowledge hurdle more often through partnerships in future. New forms of financing will also need to be used since debt financing (which is particularly popular in Germany) is generally not suitable for risky innovation projects.

- *Trend “Specialisation of sources of knowledge”*. The accelerated creation of knowledge and hence the exponential growth of the knowledge base require stronger specialisation. This applies equally to universities and research institutes as well as firms – they will all need to focus on narrower knowledge segments than they do today to keep abreast of developments in their field. However, at the same time, as just outlined, the development of successful products requires the use of ever broader knowledge. In addition to cost and risk sharing, the specialisation of the individual innovation actors will therefore be another important driver of more cooperation not only between companies and academia but also between companies (and scientists) themselves.
- *Trend “Energy shortage”*. As we argued above, government will need to bear some of the cost of developing alternative energy sources and more energy-efficient machinery and devices. But firms in many industries will also have to invest in this area to remain successful (not only in the energy industry itself but also in the mobility sector for instance). The scale and risks of these investments will prompt many companies to pool their resources. Present examples are the development of hydrogen fuel tanks, new battery technologies and hybrid drives within cooperation projects between several automobile manufacturers.

These five trends drive Germany sharply *upwards* in our scenario cross in the coming years (towards “open“, see the figure *Why the focus on “Expedition Deutschland”?*). All in all, we therefore expect the outlined trends to drive Germany towards the top right quadrant (coherent/open).

A scenario is no more than a scenario

We have derived many central characteristics of the focus scenario “Expedition Deutschland” explicitly in the foregoing discussion of the trends. Others only emerge from the combination of coherence (in politics and society) and openness (in business). These characteristics are therefore indirect, but in many cases similarly predictable consequences of the trends discussed in the previous section. In the section *Focus scenario “Expedition Deutschland”* we had already derived a number of core aspects – both directly and indirectly – in the form of short retrospects.

To plausibilise *all* the individual aspects of our scenario in this way by showing how they derive from reliably predictable trends would go beyond the scope of this publication. At the same time, this would be somewhat deceptive since:

A future scenario can only describe a *possible* future. While the trends sketched above make specific future conditions more plausible than others in many of the aspects which we analysed in the course of our scenario process, a direct derivation of this

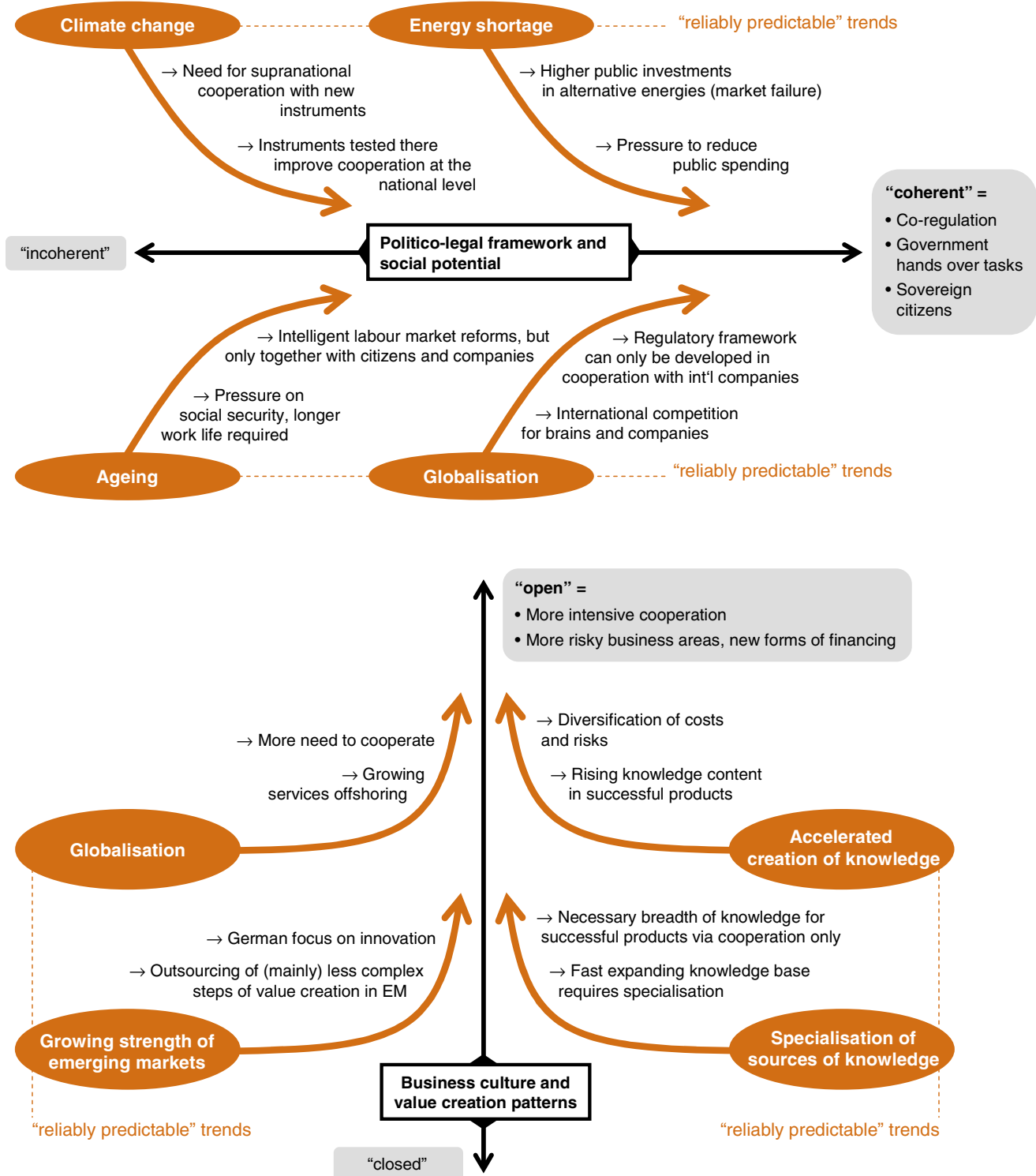
⁵⁹ A comparable development can also be observed in science where previously separate fields of research are increasingly converging (for instance bioinformatics, neuroinformatics, synthetic biology, affective computing etc.).

kind was not possible by any means for *all* the aspects analysed. Obviously, our focus scenario therefore *cannot be a holistic forecast*.

The picture of the future developed for “Expedition Deutschland” must be *consistent*, however. The development of the aspects of our focus scenario (and of the alternative scenarios, too) which could not be plausibilised with the aid of our trends still had to fit consistently into the overall picture. Each scenario must be an, in itself, coherent and plausible picture of the future if it is to be of practical benefit. Guided by this principle we were able to round out our scenarios to the form in which they are presented in Chapter 2.

Why the focus on “Expedition Deutschland”?

Reliably predictable trends drive Germany along the axes of the scenario cross



4. Eight implications for companies

The structural change on the path to our “Expedition Deutschland” scenario has deep-reaching consequences for German society, politics and economy. Society as a whole must find ways to moderate the inevitable tensions between citizens who profit from the project economy and those who fall behind. In collaboration with the other stakeholders, policymakers must perform a difficult regulatory balancing act: they need to create framework conditions that help to moderate social tensions while at the same time furthering a dynamic economic development. Companies, finally, will need to open themselves up to new fields of activity and business models, new core competences and partners, and new organisational designs and processes.

In this study we confine ourselves to sketching the implications *for business*. They will be relevant for firms in many sectors along the entire expedition path to 2020. And this path begins today.

Implication 1:

Perceive cooperation as a strategic management task

The temporary cooperation among specialists is the defining element of the project economy described in the “Expedition Deutschland” scenario. The conclusion that cooperation will be an increasingly efficient form of value creation follows already from the trends of ever faster knowledge creation and the increasing specialisation of firms and other knowledge actors.

However, there are a great many possible types of cooperation for firms. From loose associations for the purposes of exchanging information through to legally independent project organisations; from projects between equal partners through to groups gathered around a focal actor; from clubs with high entry barriers to open, “permeable” structures. Depending on the number of participants, the market, project phase etc., different forms of project can provide the optimum value creation structure. Moreover, the spectrum of types of cooperation has changed and widened in the past years. This places greater demands on successful cooperation management.⁶⁰ Therefore, firms should:

- be aware of the full spectrum of possible types of cooperation and examine whether they fit the specific needs of their sector,
- analyse the incentive structures, special legal characteristics and possible coordination and process pitfalls of the various types of cooperation,
- examine whether potential cooperation partners are suitable for the intended form of cooperation (in terms of financial resources, openness and quality of management and employees, human resources, organisational flexibility etc.).

Implication 2:

Clearly define the company’s own role in the cooperation

The firms (or individual persons) involved can assume different roles in a project partnership more or less regardless of the type of collaboration chosen:

⁶⁰ Roehl, Heiko and Ingo Rollwagen (2004). Club, Syndikat, Party – wie wird morgen kooperiert? Zeitschrift für Organisationsentwicklung 2004(3), pp. 30-41.
Hagedoorn, John (2004). Inter-firm R&D partnerships – an overview of major trends and patterns since 1960. In G. Grabher und W. Powell (Ed.), Networks – Critical studies in economic institutions, pp. 664-679. Cheltenham, Edward Elgar.

- One of the firms can be the originator of the idea or the initiator of the project. (However, this role can also be played by an actor who is no longer involved itself in the project, e.g. a public authority or NGO.)
- Firms can participate in the project as pure service providers, in other words as contractors.
- Firms can focus on contributing individual factors of production (management, employees, capital, knowledge or intellectual property).
- One firm, as focal actor, can provide the bulk of the value added or be the principal financier – and thus have more weight.

What role is played is also an important criterion for the way in which the actors share in profits. These profit sharing models range from the payment of fixed service fees or credit interest, licence royalties for intellectual property contributed, through to dividend payments and price appreciation if equity capital is provided.

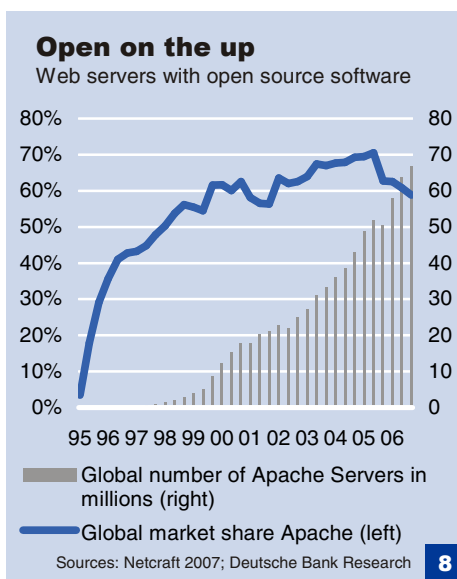
Implication 3:

Open up innovation processes to partners and customers

The rapidly growing complexity and convergence of knowledge is making cooperation increasingly crucial – especially in R&D and other innovation processes. Projects with an innovation focus can draw on the same repertoire of cooperation types and roles as general projects. One special characteristic of many innovation projects, however, is that the result of the cooperation is not a monetary return but knowledge – often protected through patents or copyright. This intellectual property is created jointly; it therefore “belongs” to the project participants jointly.

A key success factor is the transparency of the profit sharing scheme, which defines who is entitled to what shares. The considerable importance of implicit, non-codified knowledge for innovation processes – e.g. the experience and skills of the employees a firm assigns to the project – makes it particularly difficult to structure such a profit sharing scheme fairly from the viewpoint of all project participants. Moreover, in specific fields it may even prove efficient for the project participants to make the knowledge they have developed accessible to the general public – so as to involve a broader circle of researchers and development engineers. A particularly successful example is so-called open source software (see Figure 8).⁶¹

Besides this opening up of innovation processes to other supply side actors, it is also becoming increasingly crucial for market success to open them to the demand side, too. The close and systematic integration of customers in the innovation process is already commonplace at some companies today, but there are still many others which have not done so or only rudimentarily. Each industry will need to develop its own methods here.



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⁶¹ In the area of open source software the commons approach is already customary today and is practised not only by private individuals but also by firms. Here, anyone can use software products developed by others free of charge and further develop them. However, in turn, the further developments must be made available for free public use. See Hofmann, Jan (2002). Free software, big business? Economics 32. Deutsche Bank Research.

*Implication 4:***Communicate with consumer communities**

As a result of more convenient and cheaper communication, increasing consumer protection and a rising number of counterfeit products and fraud on the internet, in our “Expedition Deutschland” scenario many consumers are organised into communities based on online or cell phone platforms. These “sovereign” consumers inform each other about the strengths and weaknesses of products and suppliers or providers. Aside from these consumption-oriented communities, platforms which allow social interaction between the participants have a particularly large number of active users in our scenario. In addition, there has been a massive spread of special-interest forums and communities.

A clear trend in this direction can already be observed today – and a big challenge for marketing and sales strategists. On the one hand, these forums and communities provide the opportunity to address often very clearly defined target groups without much wasted advertising coverage. On the other, even individual negative opinions about a product or a service spread rapidly as the consumers are interacting closely. For suppliers, there is a strong temptation to take part in these forums beyond simple advertising – but this is dangerous: suspected “infiltration” by “corporate agents” being paid for contributing positive ratings of products is severely sanctioned.

*Implication 5:***Make valuing knowledge a core competence**

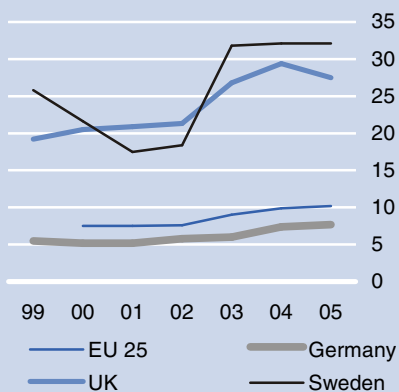
Besides employee skills, management quality, customer know-how, patents, copyrights, brands as well as unpublished technology and process know-how, an organisation’s ability to cooperate is a central component of its intellectual capital in our focus scenario. In particular, this includes its competence in analysing and controlling the legal aspects of project partnerships.

However, this knowledge and these capabilities must not only be on hand. They must also be assessed properly: firstly, so that the firm’s allocation of resources can be efficiently managed and, secondly, so as to be able to present an adequate image of the firm to customers, providers of capital, public entities providing grants, the labour market and (potential) partners. In addition to a more detailed documentation of the company’s knowledge than is customary today, firms are well advised to participate in the development of sector-specific valuation and communication standards for their intellectual capital. There are already a number of initiatives in Germany and other countries aimed at standardising and disseminating so-called “intellectual capital reports”.⁶²

⁶² See for instance Hofmann, Jan (2005). Value intangibles! Intangible capital can and must be valued – owners and valuers alike will benefit. Current Issues. Deutsche Bank Research; European Federation of Financial Analyst Societies, Commission on Intellectual Capital (www.effas.com/en/cic.htm); and the Arbeitskreis Wissensbilanz (www.akwissensbilanz.org).

Greater eagerness to learn

Persons committed to life-long learning, as % of the adult population



Sources: Eurostat 2006, Deutsche Bank Research

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Implication 6:**Provide more vocational training, foster life-long learning**

The importance of life-long learning has been increasing for some years, although, today, people in other countries display a greater eagerness to learn longer in their lives than Germans (see Figure 9). In order to empower individuals and employees to meet the frequently changing qualification requirements placed on them in “Expedition Deutschland” scenario’s job markets, firms need to provide continuous and flexible training. This applies particularly to older employees, too. Increasingly, individuals must be more self-motivated to keep on learning independently of their present job. A central area of learning is market and industry-specific knowledge. In addition, knowledge and usage skills concerning methods of technology assessment and appraising intellectual capital in general are gaining relevance. And, finally, social and intercultural skills (including languages) are becoming increasingly important for the work within projects and global sourcing and sales structures.

In our focus scenario firms (and individuals) are profiting from well structured learning markets with a broad offering of combinable learning modules and guidance/counselling sessions. Private and public universities are also addressing these markets for learning more thoroughly. In the scenario “Expedition Deutschland”, it is therefore found to be particularly efficient to outsource training. But the importance of life-long learning is on the rise, not only in our focus scenario (“Expedition”), but also in our alternative scenarios.⁶³ The motto is therefore: Provide more vocational training and engage in life-long learning!

Implication 7:**Participate in standard-setting**

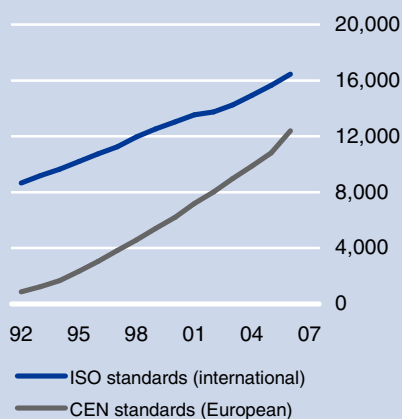
Standards of diverse kinds play a key role in the project economy. As project partners change frequently, it is essential for project processes to be standardised – from human resources to information management. Standards for technology interfaces are important in order to be able to integrate the project-relevant databases (customer data, design data, process parameters etc.) of changing cooperation partners efficiently, or to facilitate the cooperation between geographically widely dispersed teams through teleworking systems (from video conference systems through to virtual collaborative environments that enable dispersed teams to work in parallel on three-dimensional models).

What is more, technical standards for interfaces, transmission protocols, test specifications etc. are acquiring ever greater importance, regardless of whether the value creation process takes place within projects or other structures. The complex system products increasingly required by business and private customers (from combinations of music player and compatible online shop through to modular production lines) cannot be developed or used efficiently without high levels of standardisation.

These standardisation processes and regimes on many fronts not only shape the business landscape in our focus scenario in 2020 but

Standards on the rise

Number of international standards



Sources: ISO, CEN, Deutsche Bank Research

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⁶³ Various trend dynamics suggest a growing importance of life-long professional and general learning: the “lengthening life span”, in other words population ageing and the related time available for professional and personal development; the “conquest of smallest structures”, that is the growing importance of cutting-edge technologies and knowledge-intensive services; and the increasing “opening of work and society” with more flexible career paths and work environments, and a stronger participation of women in professional life.

are already visible as a clear trend today (see Figure 10). Therefore, it gets all the more important for firms not only to know and use these standards but also to take an active part in the development of new standards: in this way own strengths can be built into the standards.⁶⁴ Large companies are already involved in standard-setting processes today. Small and medium-sized enterprises often do not have sufficient resources but would stand to gain a lot – especially in the project economy.

Implication 8:

Tap new financing sources and targets

We expect companies to use a growing spectrum of instruments for their financing, regardless of which scenario Germany is headed for. Firstly, there will be a move away from bank loans, which are traditionally a very important form of finance in Germany, towards more strongly capital market-based financing instruments of the kind which are already available today. Secondly, new instruments will broaden the spectrum.

Given the growing importance of intangible capital as a production factor, instruments based on the intellectual property of the firm which is seeking capital will play an important role. One example is the securitisation of intellectual property assets (*IP-backed securities*), which is already common today, though fairly seldom and mostly in smaller transactions.⁶⁵ It is conceivable, for instance, that in future young companies will securitise their intellectual property to finance their growth.

Today, some small and medium-sized enterprises in Germany (*Mittelstand*) still take a critical view of capital market-based forms of financing. For them, the project economy could be a good “testing ground” for new financing instruments. If involved in a legally independent project, they could use capital market instruments for the financing – and thus gather experience with these forms of financing without this having any, or any significant, effect on their own organisation.

Finally, in the project economy there will also be a stronger incentive for small, mid and large cap companies to invest venture capital in young companies (*corporate venturing*). With the growing success of German start-ups in cutting-edge technology and knowledge-based services on the way to the “Expedition Deutschland” scenario, this will not only offer potential for attractive returns. The investment of venture capital in dynamic young companies is at the same time an investment in knowledge about relevant developments and in network integration. And it is precisely this integration which will be a prerequisite for success in the project economy for both small and large cap companies.

⁶⁴ Moreover, intellectual property of the firms involved in the development process is often integrated into the technical standards.

⁶⁵ See for instance Hofmann, Jan (2006). Something's invisible in the state of Germany. Talking point. Deutsche Bank Research.

5. Outlook

Value creation in temporary, organisationally and often legally independent projects will increase. That is not only the core theme of our focus scenario “Expedition Deutschland”, which outlines what business, social and political changes this could imply. Rather, the detailed analysis of a number of reliably predictable trends has convinced us that this “project economy” will acquire growing importance generally in Germany and in other countries.

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In a first overview we have therefore sketched how companies should already prepare for this structural change today. We will be elaborating on some of these aspects in more detail in follow-on studies in the coming months (further information available at www.expeditiondeutschland.de/en). However, project economy-style value creation will have deep-reaching consequences for policymakers and individuals, too. Our aim with this study is therefore to provide an inspiring frame of reference and food for thought, on the basis of which readers can derive suitable options for action from their own perspective. In our view, this is the core purpose of any futures research and strategic foresight. Let's start – on the expedition!

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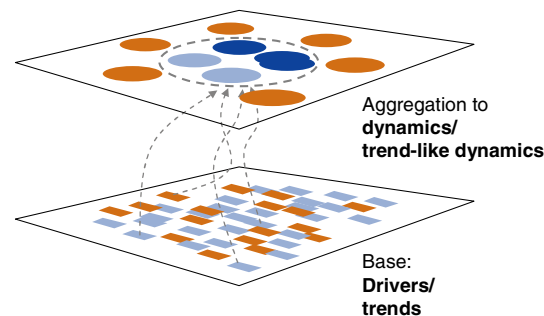
Stefan Schneider (49 69 910-31790, stefan-b.schneider@db.com)






Appendix

The spectrum of relevant drivers of our scenario, structural change in Germany over the next one-and-a-half decades, is broad. Moreover, the future development of some of these parameters is reliably predictable (“trend-like drivers” or, for short, “trends”) while the development of others is uncertain.

To make this complexity manageable and communicable we have aggregated drivers (and some trends) that are thematically related and whose development is correlated into “dynamics”, and the trends (and some non-trend drivers) into “trend-like dynamics” (see also the box *Elements of our scenario analysis* in Chapter 1 and the figure *Deriving dynamics from drivers and trends* below). We then singled out two of the dynamics as so-called “core dynamics” of our scenario analysis. They are used to build our scenario matrix (see pages 14-17).

Deriving dynamics from drivers and trends



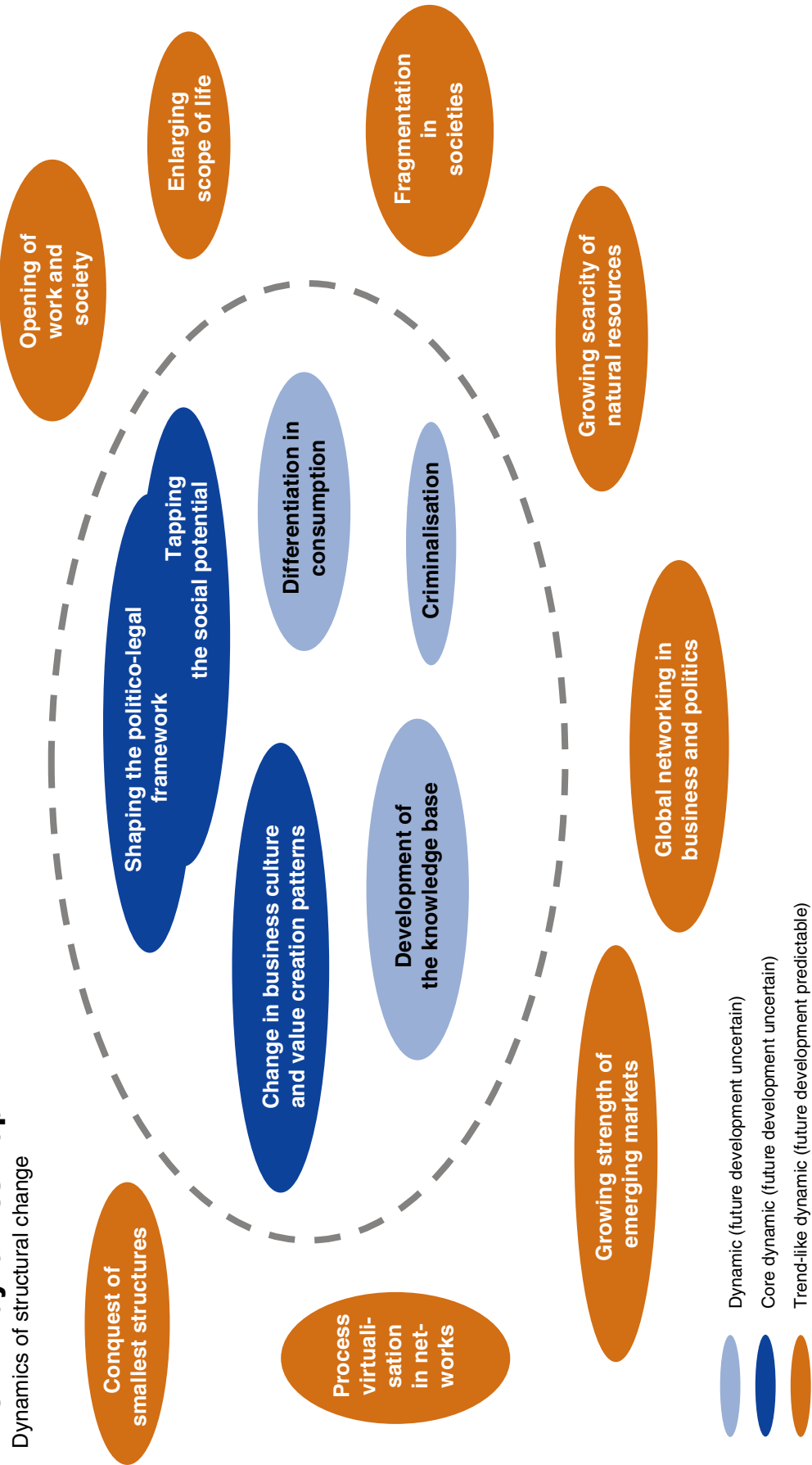
-  Core dynamic (future development uncertain)
-  Dynamic (future development uncertain)
-  Trend-like dynamic (future development predictable)
-  Driver (future development uncertain)
-  Trend (trend-like driver, future development predictable)

On the following pages we show

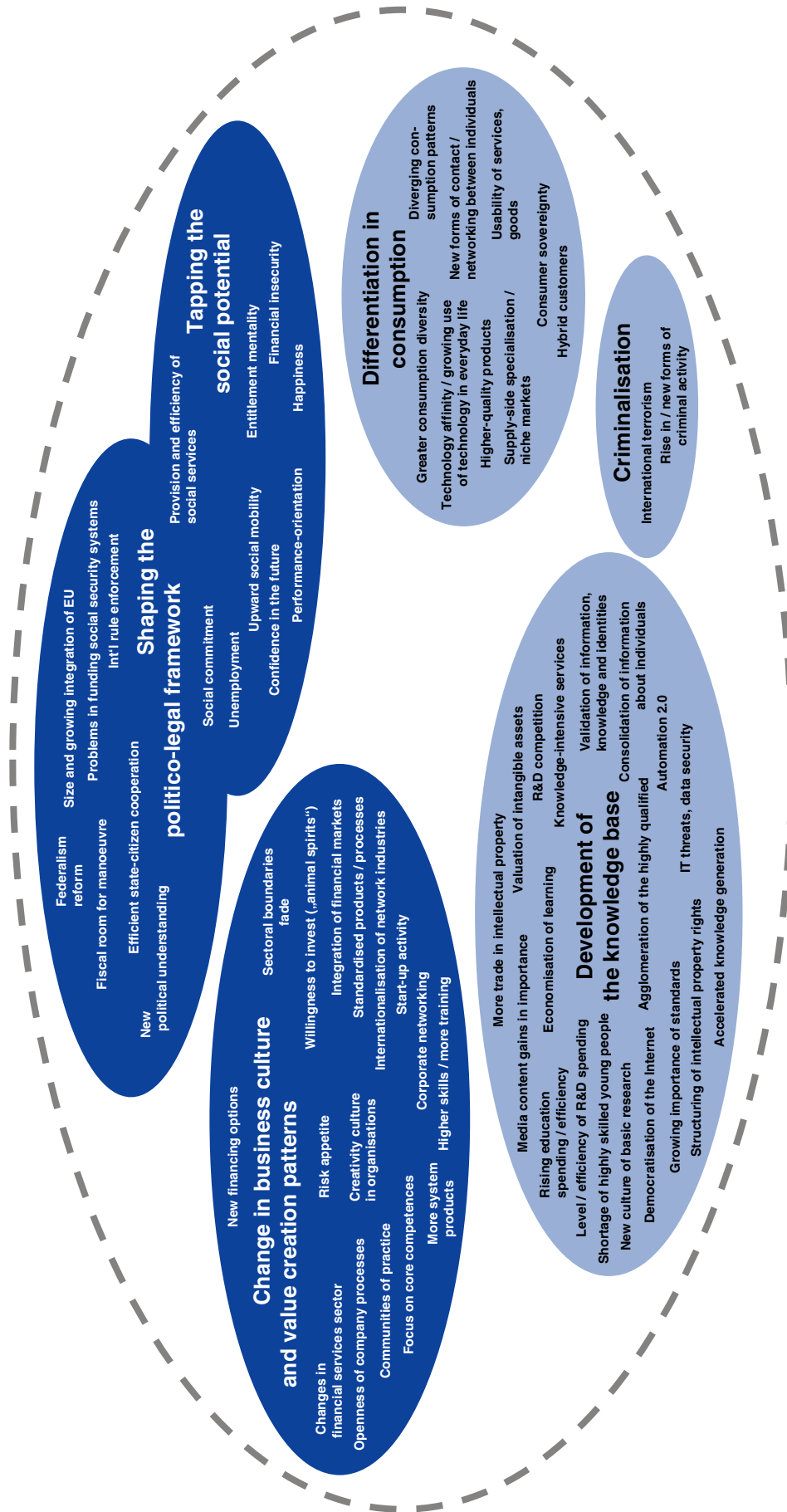
1. the complete DBR dynamics map once again without the individual drivers and trends as a general overview,
2. the non-trend-like dynamics with the related (mostly non-trend-like) parameters, and
3. the trend-like dynamics with the related trends (and some non-trend-like drivers)

Further information about the methodology can be found at www.expeditiondeutschland.de/en.

The DBR dynamics map
Dynamics of structural change

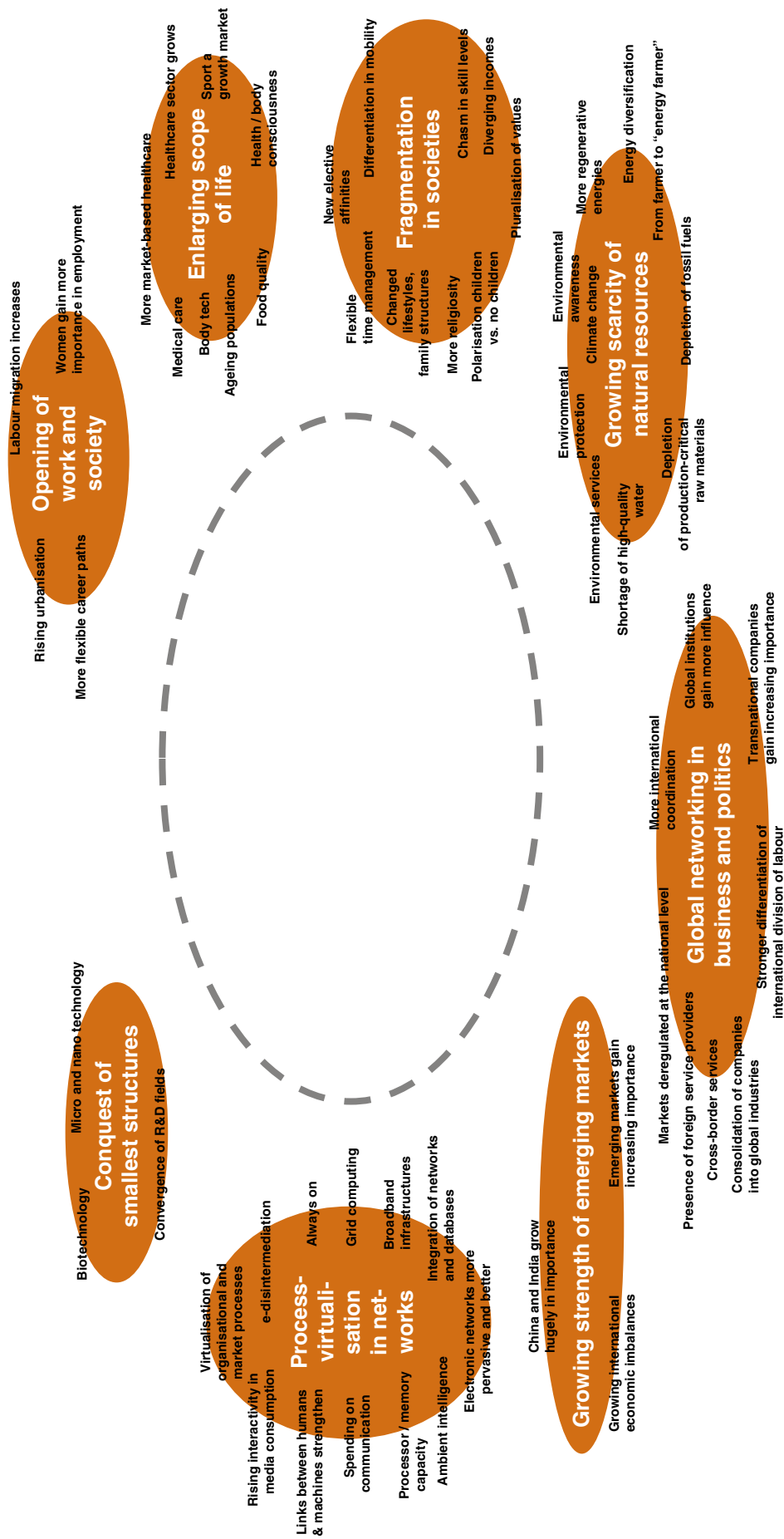


Dynamics of structural change (non-trend-like)
with mostly non-trend-like drivers and some trends



Dynamics of structural change (trend-like)

with mostly trends and some non-trend-like drivers



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