



Hamburg  
Institute of  
International  
Economics

# SECURITY

## Strategy 2030

— WEALTH AND LIFE —  
IN THE NEXT GENERATION.  
— AN INITIATIVE OF —  
THE HAMBURG INSTITUTE OF  
INTERNATIONAL ECONOMICS  
— AND BERENBERG —



**BERENBERG**

PARTNERSHIP SINCE 1590



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»Berenberg · HWWI: Strategy 2030 – Security«  
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We have endeavoured to meticulously research and process the information contained in this study. In part, we have drawn upon information collected by others. Certain data may no longer be correct, especially due to the passage of time or as a result of changes in legislation. We can therefore accept no responsibility for guaranteeing that all information is accurate, complete and up to date.

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Strategy 2030 is the name given to a series of studies that our organisation has published jointly with the Hamburg Institute of International Economics (HWWI) since 2005. With this series, we aim to spotlight trends that already concern us today but which will also have an impact tomorrow. Indeed, our behaviour now will decisively shape and affect the life of the next generation.

The world is experiencing a period of ever-faster change – caused by continued leaps in technology, ever greater volumes of knowledge and a globalising economy. Political, social, technological and economic changes have a reciprocal effect – sometimes intensifying but sometimes inhibiting one another – and thus seem more and more complex and less tangible. This is all the more so because they extend far into the future, in the case of demographic change even across generations.

Set against this backdrop, we have dedicated the series entitled Strategy 2030 – Capital and Life in the Next Generation to long-term economic issues, looking at processes of social change outside of the traditional financial market framework. The studies unite the expertise of economic analysts recognised beyond the borders of our country and the comprehensive experience of a leading private bank that is rich in tradition.

We hope to have provided readers with a study that is interesting and informative!

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## Executive Summary

- The security industry remains a growing market. Be it geopolitical conflicts, international terrorism, violent crime or cyber risks – there are plenty of pressing reasons to invest in security precautions. International terrorism alone in 2014 caused direct costs estimated to total around \$53 billion, more than ever before.
- Spending on security has indeed risen again of late. This is seen, for instance, in military expenditures worldwide, which are approaching the \$1.8 trillion mark. The undisputed leader in this segment remains the United States, although China is recording very fast growth.
- We do not expect the security situation to improve in the short run. Risks are practically inherent in the system these days. Globalisation has been a big success in economic terms. But the chance to create a functioning global organisational framework in parallel was missed. The world has become fragile because regional problems and conflicts often tend to expand into global crises.
- In economic terms, the consequences of terrorist attacks were manageable in the past for the country hit by terror, partly thanks to resolute counter-measures by governments and central banks. The economic fallout from terrorist attacks is easiest to deal with when they are one-off attacks on major economies. In the case of less well-developed and economically less diversified countries, on the other hand, series of attacks can have a considerable impact. Economic development can be tangibly damaged, especially in the heavily affected tourism, transport and insurance industries.
- The prosperity of the countries affected can suffer serious, mainly long-term damage from terror, when things like state anti-terror measures curb what was previously free trade. This predominantly concerns emerging markets that depend heavily on foreign capital and imports from the industrialised world.
- Our forecast for the growth of the security market from 2008 (+7.8% p.a.) has come true. We expect this growth trend to continue into the future. Government spending programmes are likely to be expanded. Private security services, and personal and property protection, will flourish. High spending growth in the battle against cyber crime is also pretty much certain.
- Lucrative investment opportunities are available to capital investors in the security segment. Alongside a number of individual securities, there are now also a series of fund products and index certificates to choose from. Some of these have enjoyed a much stronger performance since 2008 than stockmarket indices like the DAX and EURO STOXX 50.

# 1 Introduction

Security is one of the most basic needs that people have. If the security of individuals, groups of people or even a whole country is under threat, a series of negative effects ensue. This gives rise to costs for fending off the threat or remedying damage that has already occurred. Furthermore, high yet hard to measure non-financial costs accrue in some cases when fear takes hold. In many instances, the psychological consequences may be more serious than the material damage – this is true in the case of violent crime, for instance. Dangers and threats are perceived in terms of the probability of being affected and the proportions of the potential damage.

Security is a condition with different dimensions and configurations. Security risks arising from things like political, economic, medical and technical uncertainties impact individuals or entire societies, items of property, institutions, and information and data. In this study, security is taken to mean providing protection against deliberate damage by third parties.

The present study is an update of the joint publication by Berenberg and the Hamburg Institute of International Economics entitled »Security Industry«, which was released in 2008 in the series »Strategy 2030. Life and Capital in the Next Generation«. Since then, the world has changed considerably in terms of economics, politics and technology. The global financial crisis, geopolitical conflicts and terrorism, and digitisation are the main developments of special relevance for the security segment. Our 2008 study correctly predicted the fundamental and growing importance of the security industry. Nonetheless, the general security situation has discernibly changed, almost experiencing a paradigm shift. In light of the uncertain situation of the world, the topic of security is right at top of the agenda for politicians and businesspeople alike. The perceived increase in insecurity and demand for security have made a major contribution to an expansion of so-called fat-tail risks – improbable events that nonetheless have the potential to cause severe damage/loss. Avoiding such risks requires special, mostly very expensive solutions. Such risks arise especially in times of major political, economic and technological upheaval. One indicator of this is falling trust in institutions whose important function is specifically to reduce uncertainty.<sup>1</sup> As a result of more severe weather events like floods and severe storms, climate change, for instance, represents a risk to the security of people and buildings, but this can only be controlled by means of global agreements and institutions causing high costs for regional optimisation.

We clearly live in such uncertain times. Consequently, security is set to gain in importance again over the next few years and decades, offering more and more investment opportunities for the capital markets in its role as a mega-trend. So we are taking this opportunity to look again at the topic of security from the macroeconomic perspective and the capital market view with an update of the 2008 study.

<sup>1</sup> Cf. Tresch (2016)

## 2 Current security-related developments

### 2.1 Geopolitical conflicts

The world has got itself into a state of disorder. 25 years ago, shortly after the Iron Curtain came down, the American political scientists Francis Fukuyama proclaimed the »end of history«. In actual fact, what followed was accelerated globalisation, during which the global markets trumped national politics and limited domestic leeway. Today, we are experiencing more the return of history in the sense that deeper and longer lines of historical development have become more important for understanding global correlations. The international body politic faces major challenges, including things like managing the conflict between Russia and Ukraine, fighting so-called Islamic State (IS) and resolving the refugee crisis.

Rarely if ever has the responsibility of the international political community been as great as it is today. None of these conflicts are the result of random coincidence. Instead, they share a common underlying cause. The world does not have a functioning global framework for limiting and resolving regional conflicts that are tending to expand and worsen to create global crises. The institutional crisis in the global economy can be considered a consequence of a type of globalisation that has not created the requisite framework for global governance at the same time. This has given rise to systemic contradictions and incongruences between institutions and their territorial reach. One example of this is the crisis in the eurozone, which failed to create a complete institutional balancing and stability mechanism, thus allowing uncertainty about the continued existence of the single currency to arise in times of crisis. The resulting uncertainty practically acts as a paradigm, as the potential costs are enormous.

Just how serious the consequences of the lack of an organisational framework can be is demonstrated by the change in American foreign and security policy direction by US President Barack Obama. The rejection of military intervention as a tool of foreign policy and the pivot towards a more cooperative foreign and security policy at least contributed to the emergence of the refugee crisis in Europe. It is now becoming apparent that the Schengen Agreement, entailing the abolition of internal borders within Europe, will not work if there is no agreement on a common European refugee policy. Also with regard to the Ukraine conflict, it is apparent that Europe is not up to the security policy challenge as Wolfgang Ischinger, the chairman of the Munich Security Conference, emphasizes. At the same time, Ischinger warns that the risk of military confrontation in the heart of Europe is greater today than at any time since the end of the Cold War.<sup>2</sup> This view is underpinned by a sharp increase in the number of military near-misses. The violation of airspace, including between Russia and Turkey, could trigger an automated chain reaction that can no longer be interrupted by human intervention. The risk of an »unintentional war« in Europe has thus increased ominously.

After remaining constant for a number of years and even falling slightly at times, global military and defence spending has risen of late in response to the greater global threat (cf. Figure 1).

<sup>2</sup> Cf. *Wirtschaftswoche* (2016)

## Development of military spending worldwide, 2000 – 2015

Figures in billion US-Dollar

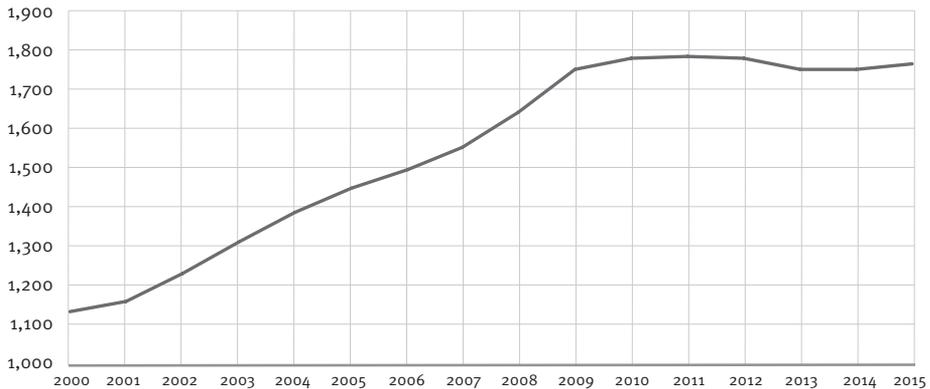


Fig. 1

Sources: SIPRI (2016); HWWI calculations.

## Countries with the highest military spending worldwide, 2015

Figures in billions of US dollars

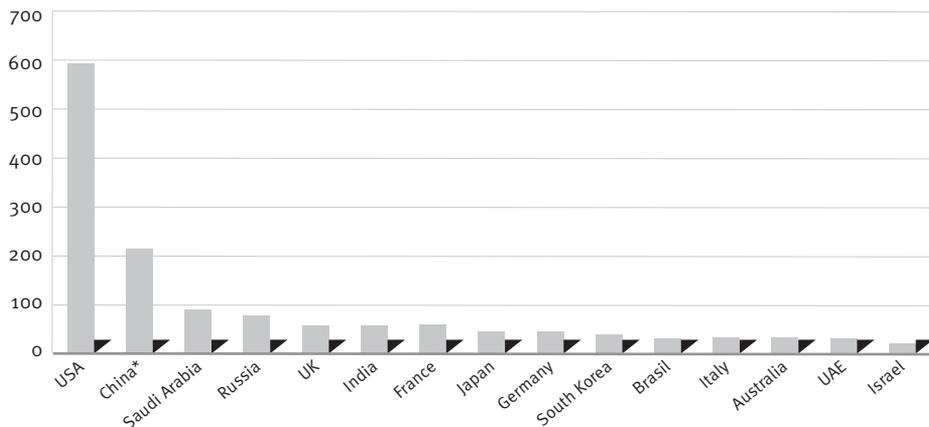


Fig. 2

\* SIPRI estimates

Sources: SIPRI (2016); HWWI calculations.

Military expenditure varies greatly from country to country. The United States spent by far the most in 2015 at just under \$600 billion, followed by China with a good \$200 billion (cf. Figure 2).

In terms of the development of military spending over recent years, the sharp increase in the budgets of China and Russia since 2000 is conspicuous, while the United States similarly expanded its spending quickly for a time in response to the terrorist attacks of 11 September 2001 only to reduce it again as of 2010 in part as a result of the new course in US foreign and security policy

### Development of military spending in selected countries (absolute figures)

Figures in billions of dollars

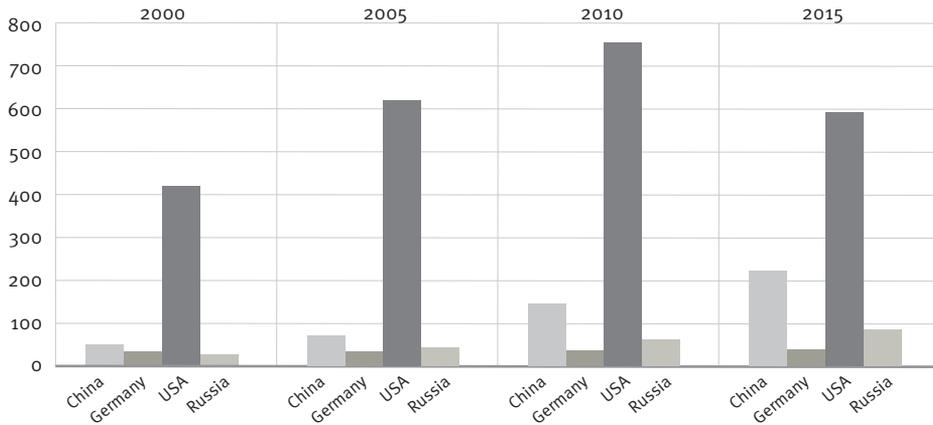


Fig. 3

Sources: SIPRI (2016); HWWI calculations.

under President Obama. Germany, on the other hand, has essentially kept its spending roughly constant or rising only slightly (cf. Figure 3). It should be noted, though, that the German army's equipment is occasionally criticised as being inadequate.

The greater political threat around the world also has a negative effect on the global economy. Renationalisation and deglobalisation have a direct and indirect impact on international trade and transaction costs. In this context, the general lack of a global framework and the institutional deficits play a key role. At the same time, the continued existence of the economic imbalances arising from the global financial and economic crisis of 2008/09 is generating uncertainty. Such risks in Europe can be cited as illustrative of the whole. Here, the exclusion of Greece from the eurozone looms large, while the UK is considering leaving the European Union. Both events would have serious consequences for the institutional settlement and cross-border trade. Although neither of these would have a direct impact on military security in the narrower sense, reintroduced border controls would entail security-related costs. And the status of the UK in terms of trade and customs regulations as well as in international law would be uncertain for many years.

Political borders are playing an increasing role in terms of security again. After years of deregulation and the dismantling of borders, it has become clear that institutions need to be modified in terms of their design and their territorial reach to the same extent. This has not happened enough to date, which has evidently served to increase the level of insecurity in the international community. Rarely has its responsibility for global security been as great as it is these days. Over a hundred years ago, before the outbreak of World War I in 1914, the world found itself in a security constellation with certain similarities to today.

## 2.2 International terrorism

A latent threat has arisen from the string of terrorist attacks over recent years. That this danger has returned to Europe is seen primarily from the horrific events in Paris on 13 November 2015. Within hours, (suicide) attackers had carried out terrorist strikes at several locations in Paris leaving 130 dead and 350 injured. Among of the places attacked were the Stade de France, where France were taking on Germany in a football friendly match, and the Bataclan, a theatre and club where the rock band Eagles of Death Metal was giving a concert. Since then, many European cities have been subject to lasting terror warnings, with Brussels among the main perceived targets. In the early morning of 22 March 2016, attacks were carried out at Brussels Airport and in a metro station in the city centre despite the acute threat and the highest terror warning level that had been in place for several weeks. The attacks claimed 35 dead and over 300 injured.

The risk of terrorist attacks has similarly increased outside of Europe. The number of deaths from such attacks is the highest in war-torn countries and crisis-hit regions like Iraq, Afghanistan and Nigeria (cf. Figure 4). According to figures from the US State Department, however, the number of terrorist attacks worldwide fell by 13% in 2015 compared with the previous year, while the number of deaths as a result of such attacks declined by 14%.

This represents the first decline in the number of attacks and fatalities since 2012. Attacks were carried out in 92 countries in 2015. More than 55% of the attacks took place in just five countries – Iraq, Afghanistan, Nigeria, Syria and Pakistan – with these countries accounting for 74% of all fatalities from terrorist attacks. Alongside so-called Islamic State, Boko Haram in west Africa is one of the most dangerous and active terrorist groups. While the number of abductions fell in 2015, the number of people abducted rose.<sup>3</sup>

<sup>3</sup> Cf. US Department of State (2016).

### Deaths and injuries from terrorist attacks by country, 2014

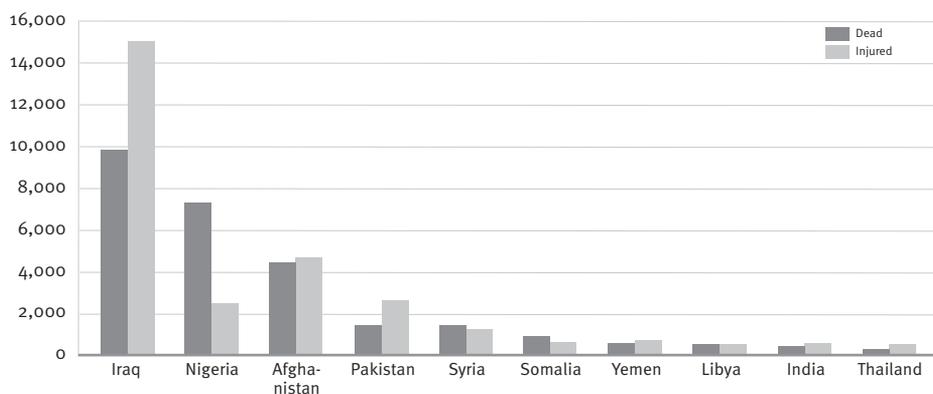


Fig. 4

Sources: IEP (2016); HWWI calculations.

The threat of terrorist attacks has extended to other countries and regions that are more popular with tourists, with strikes in countries like Turkey, Tunisia and Egypt increasing. A strategy that can be identified is that private individuals are increasingly being targeted in their daily lives by terrorists. For one thing, terrorism has »migrated« from rural Turkey to big cities like Ankara and Istanbul, and for another, plane crashes with tourists on board have also gone up.

The motives have shifted considerably over recent years. The importance of religiously motivated terrorism has risen in public and media debate. Measured by the number of terrorist attacks overall, the actual threat is, if anything, tending to decline in Europe (cf. Figure 5). This finding

### Terror attacks in the EU over time, broken down by motive

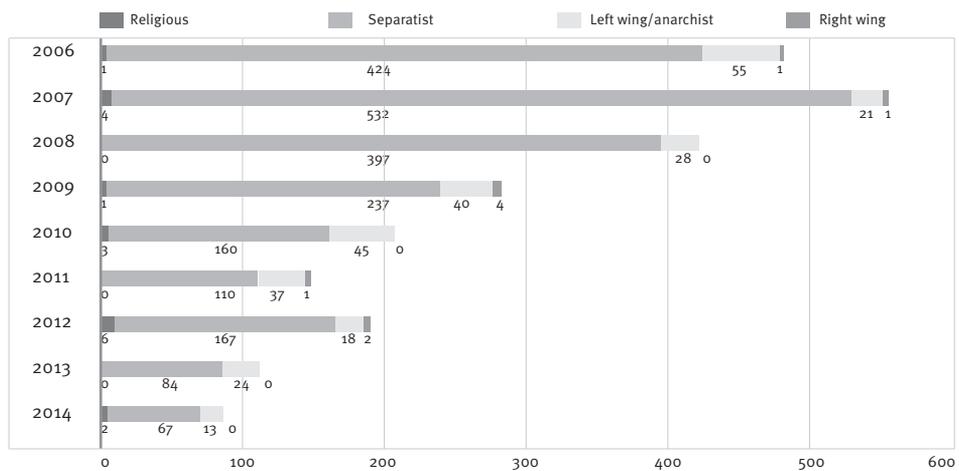


Fig. 5

Sources: Europol (2016); HWWI calculations.

### Terror arrests in the EU over time, broken down by motive

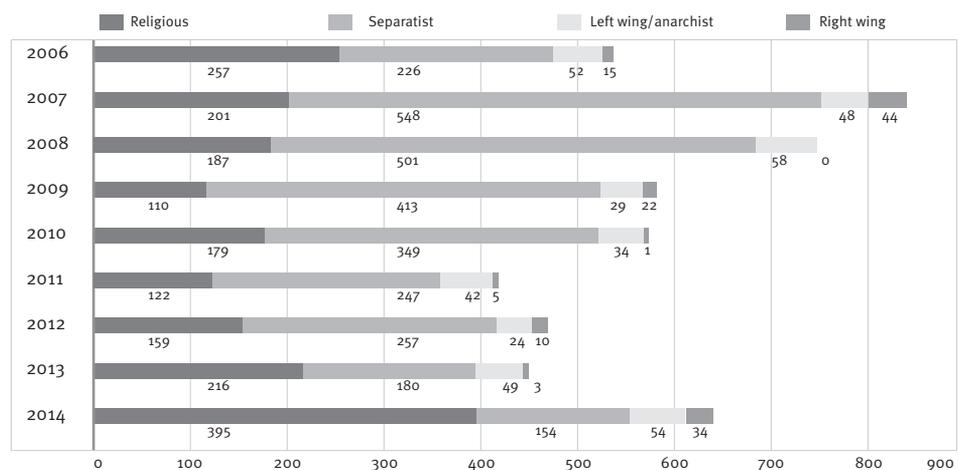


Fig. 6

Sources: Europol (2016); HWWI calculations.

### Cost of terrorism worldwide, 2000 – 2014

Figures in billions of dollars

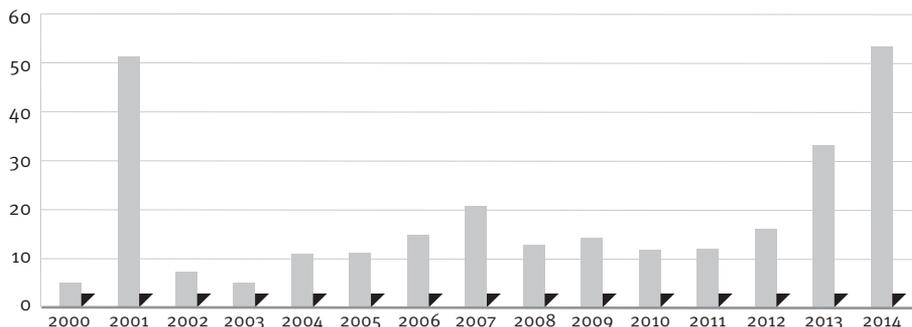


Fig. 7

Sources: IEP (2016); HWWI calculations.

represents a certain contradiction to the present perception of latent threat. This may well reside in the feeling that has moved closer to people's everyday lives as well as the fact that greater success has been achieved with foiling attacks. This is indicated by the number of arrests, which has risen overall since 2011. In this context, the increase can be attributed above all to the higher number of arrests of people with religious motives (cf. Figure 6). The assumption in this regard is that investigations have been expanded considerably in this direction in response to the greater threat.

All in all, the cost incurred by terrorism has risen sharply over recent years (cf. Figure 7), although this chart only includes the direct costs. Added to this are costs incurred by changed behaviours with people avoiding possible danger spots or measures being taken like a greater police presence. The estimated direct costs totalling almost \$53 billion in 2014 even exceeded those from 2001, the year of the terrorist attack on the World Trade Center in New York on 11 September. It is safe to assume that the costs have risen further since 2014 and will probably remain high for the foreseeable future (please refer to the following discussion on the cost of terrorism for more information). Even if the threat from current terrorism has increased, the number of victims remains on the low side compared with other security risks. Nonetheless, there exists the general desire to take additional measures to combat terrorism more actively than other security risks, possibly in part for higher level political reasons of defending an open society and the liberal world order. Not only the quantitative but also the qualitative threat plays a role in this decision accordingly.

### 2.3 Digitisation and cyber risks

Up until now, the issue of data crime has played a relatively small role in public perceptions. As affairs involving the intelligence agencies have evolved, this topic and its relevance have made their way into public awareness. Data protection is set to rapidly become a huge issue as a result of the present and future digitisation of business and society. Digitisation is being made possible by the technical ability to store, process and connect very large data volumes. This exchange of data is fundamental for the digital age. The boosts this gives to efficiency and productivity is mirrored by the risk of sabotage, data theft, and military and industrial espionage. A good example of this ambivalence is seen in drone technology. Drones can be used both in the protection of the public and espionage. Estimates suggest that the market for drones will rise from around \$4 billion in 2015 to roughly \$24 billion in 2025.

The volume of data generated worldwide has risen massively over recent years. This volume can be expected to go on growing exponentially in line with the widespread digitisation of almost all areas of life in every country in the world. The worldwide volume of data is expected to expand by a factor of five by 2020 compared with 2015 levels (cf. Figure 8).

#### Annual volume of digital data generated worldwide

Figures in Exabyte

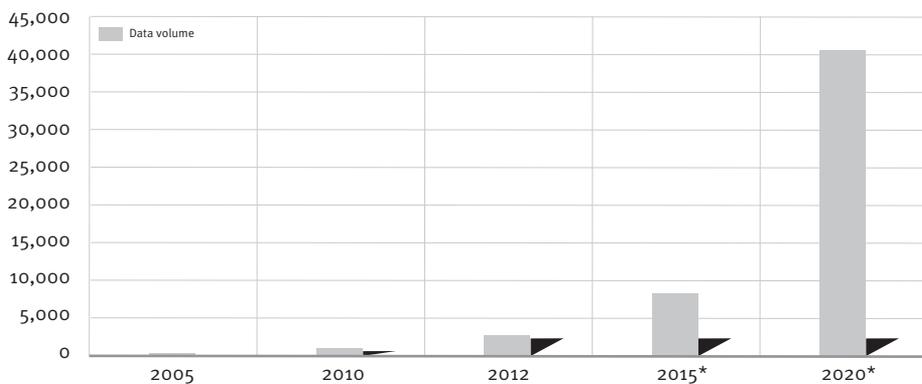


Fig. 8

\* Forecast

Sources: IDC (2016); HWWI calculations.

The increasingly mobile usage of digital offers, particularly on the private side, is similarly leading to a rapid increase in the volume of mobile data created by document exchange (cf. Figure 9). This rise will also be exponential over the coming years. Incidents of data theft, sabotage and manipulation can be expected to climb, especially those targeting sensitive personal data in financial transactions.

## Mobile data volume from file-sharing worldwide

Figures in terabytes per month

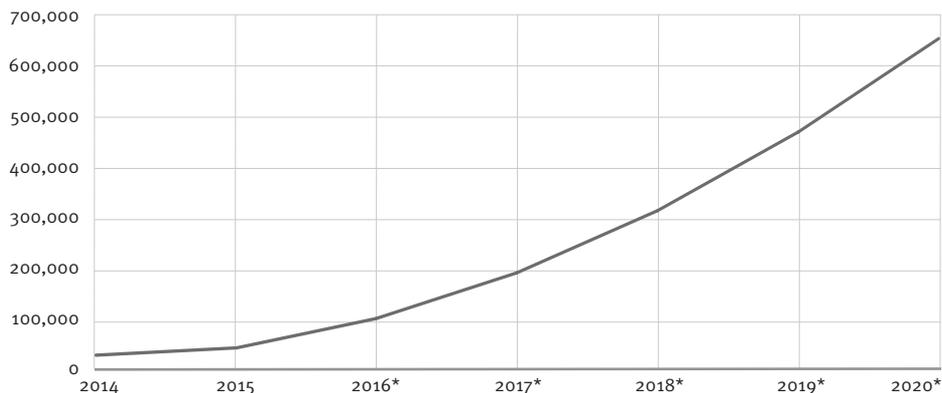


Fig. 9 \* Forecasts

Sources: Cisco Systems (2016); HWWI calculations.

Alongside the expanding private usage of online services, it will be absolutely essential for companies to seize the opportunities opened up by digitisation. Otherwise, established companies will be forced out of the international value chains in this digital recalibration of the world. In turn, data security is set to become a major business risk for firms. A study by Bitkom works on the assumption that, across all industries, every other company in Germany was affected by espionage, sabotage or data theft over the last two years.<sup>4</sup> The most heavily hit industries are carmaking (68%), chemicals and pharmaceuticals (66%), finance and insurance (60%), healthcare (58%), media and culture (58%), retailing (52%), and IT and telecommunications (52%). The study estimates the damage inflicted each year to total around €51 billion. For companies affected by data loss, the damage averages €3.42 million.<sup>5</sup>

Today, no company is completely safe. So the question is not whether a firm will be targeted, but when. Traditional viruses and malware are no longer behind the most frequent attacks, as enterprises are more frequently subject to things like phishing and social engineering, botnets and denial of service. The crime statistics published by the German Federal Ministry of the Interior record the known instances (and only these) of data manipulation and computer sabotage. In 2008, there were 2,207 such instances and in 2011 already 4,644. After this, incidents rose quickly to 10,857 in 2012 and 12,766 in 2013.

A number of major hacker attacks have become generally known over recent years, with millions of items of customer data, including sensitive password and credit card details, being hacked. Against this backdrop, security solutions such as encryption technologies (including blockchains in the field of financial transactions) for the digital exchange of data have become much more important.

<sup>4</sup> Cf. Bitkom (2015).

<sup>5</sup> Cf. Ponemon Institute (2014).

Köncke and Buehler cite the following potential damage for companies:<sup>6</sup>

- Loss of data and the resulting vulnerability of the enterprise
- Violations of privacy and resulting legal or damage claims
- Disruption or interruption of operations
- Hacker attacks and resulting vulnerability to extortion
- Violation of personal rights and intellectual property rights

Moreover, the complexity of data security is set to go on growing. Questions relating to data security, data protection and the insurance of data risks are thrown up by the proliferation of platforms on which large volumes of data (big data) are processed and exchanged, the development of artificial intelligence and self-learning algorithms connecting autonomous machines, self-driving cars, robots and the exchange of program files for 3D printing.

## 2.4 Crime

A certain everyday form of insecurity for private households results from break-ins and theft. Although »day-to-day crime« has not been the subject of much public debate for some time, it does represent the most real threat because it happens across such a broad area. Incidents of burglary have risen alarmingly in Germany of late, climbing by almost 60% within ten years (cf. Figure 10). Whereas there were just 120,000 break-ins in 2010, that number had risen to 167,000 by 2015.<sup>7</sup> This represents an increase of one-third in five years. Insurance payouts increased from €350 million

<sup>6</sup> Cf. Köncke/Buehler (2015).

<sup>7</sup> Cf. Bundeskriminalamt (2016).

### Development of burglaries in Germany

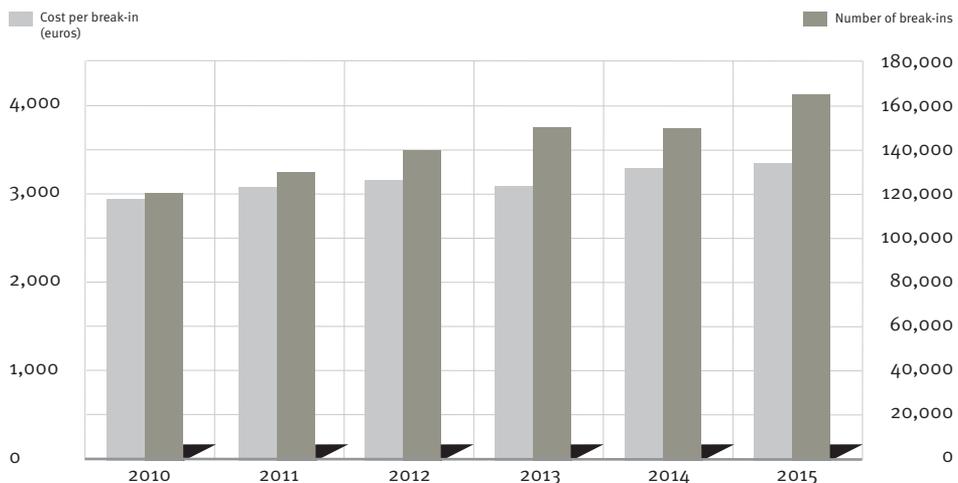


Fig. 10

Sources: GDV; German Federal Criminal Police Office (2016); HWWI calculations.

to €530 million during the same period, corresponding to a rise of around 50%. The average loss per break-in totals somewhere over €3,000,<sup>8</sup> while the detection rate over the years is pretty low at around 15%.

It is only possible to speculate about the causes of the rise in burglaries. The increasingly imbalanced distribution of income and wealth in a given society is often cited. Urbanisation and the related rise in anonymity may also account for some of the rise. In many instances, social norms and the social capital may also play an important role in their function as measures of solidarity, reciprocity and trust in a society. Furthermore, there is often a correlation between social norms and the uneven distribution of material wealth.

Thus, countries with a massively uneven distribution of income and wealth often see high levels of looting and theft, although these are closely related to poverty.

In such cases, there are direct private »solutions« and indirect, government-sponsored measures with a very long-term horizon. An increase of security services can be observed in the field of personal and property protection. The umbrella term »home security« encompasses new digital technologies that are being employed in ever greater numbers of private households, representing a lucrative market for the future. The degree of private security can, however, be impacted in the long run by social- and financial-policy measures. The ever more uneven distribution of income and wealth that can be observed in not only many emerging markets but also industrialised nations has a latent effect towards increasing crime.

<sup>8</sup> Source: <http://www.gdv.de/2015/10/wohnungseinbrueche-in-zahlen/>

## 3 Economic impact of terrorist attacks

### 3.1 Economic impact on the domestic economy

Terrorist attacks in the past generally had little macroeconomic impact on the target country partly because governments and central banks took strong counter-measures. Compared with the human suffering caused by terrorist attacks, the economic consequences are manageable. This is especially the case when the incidents are on-off attacks on major economies. In less developed countries with less diversified economies, on the other hand, series of attacks can have a considerable impact as discussed below. Economic development can take a serious hit, especially in the badly affected sectors of tourism, transport and insurance. Consequently, it is necessary to understand the economic effects of terror and implement appropriate economic policy to stabilise the economy. This makes it possible to avert terrorism or at least ameliorate its economic consequences. As damaging the economy is the terrorists' goal in many cases, this can serve to reduce their incentives.

Terrorist attacks cause direct costs attributable mainly to the destruction of buildings, infrastructure and human capital. Table 1 shows that these are generally low when set against the country's gross domestic product. In the case of the ten terrorist attacks with the highest direct costs, for the most part these amounted to a few hundredths of GDP. By contrast, the attacks in Sri Lanka and Jordan cost up to 8% of GDP. We already discussed the cost of the terrorist attacks on 11 September 2001 at length in our study of the security industry.<sup>9</sup>

Often even higher are the indirect costs, reflecting the reactions of households, firms and the state.<sup>10</sup> The economic cycle can be disrupted in various ways. In the wake of terrorist attacks, households suffer notably from the fear of further terror.<sup>11</sup> In addition, uncertainty about the future political and economic framework rises. The risk propensity falls, consumer confidence suffers,

<sup>9</sup> Cf. Berenberg/HWWI (2008).

<sup>10</sup> Cf. Brück/Wickström (2004).

<sup>11</sup> Cf. Eckstein/Tsiddon (2004).

#### The 10 most expensive terrorist attacks broken down by cost for insured property

Figures in millions of dollars

Terrorist attack	Direct costs <sup>1</sup>	Gross domestic product in year of attack <sup>2</sup>	Cost as a % of GDP
11/9/2001 Mainly New York, USA	25,152	11,666,077	0.22%
24/4/1993 London, UK	1,215	1,647,219	0.07%
15/6/1996 Manchester, UK	996	1,845,778	0.05%
10/4/1992 London, UK	899	1,604,763	0.06%
26/2/1993 New York, USA	837	8,758,135	0.01%
24/7/2001 Colombo, Sri Lanka	533	19,780	2.69%
9/2/1996 London, UK	347	1,845,778	0.02%
23/6/1985 North Atlantic, India	217	262,309	0.08%
19/4/1995 Oklahoma City, USA	195	9,359,504	0.00%
12/9/1970 Zarqa, Jordan	170	2,2113	7.69%

**Table 1**

<sup>1</sup> Deflated to 2015

<sup>2</sup> Deflated to 2005

<sup>3</sup> GDP for Jordan from 1975

Sources: Insurance Information Institute, World Bank.

and private consumption declines. Affected particularly often are the tourism and transport industries, as these represent the most frequent target for terrorists. In the three years after the strike, the fear of attacks reduced US consumption (2002–2004) by 0.3% or \$40 billion.<sup>12</sup>

Terrorist attacks hit companies by raising risk premiums for loans and insurance. Above all others, the insurance industry suffers major losses in the wake of terror attacks. For one thing, such events trigger large-scale financial claims from insured parties. At the same time, some policyholders are unable to pay the higher premiums, meaning that the insurance cover and hence the insurers takings fall. Furthermore, the stockmarkets may collapse, as happened after the terrorist attacks in the United States and Spain in 2004. While the Dow Jones index in the United States fell by around 14% from the day before the attack to the following Friday, the Spanish IBEX index lost around 5% of its value in the same period. This causes company and household assets to decline, and with them their willingness to spend. Alongside the greater insecurity, all sectors of the economy face more difficult financing conditions, causing private investment to decline. Studies demonstrate how foreign direct investment in particular falls sharply in the wake of terrorist attacks.<sup>12</sup> Concerted action by the central bank and government is required to stabilise the financial system. This helps to offset the lower level of liquidity and reduce disruptions in the economic cycle such as interrupted supply chains.

Not only does it make financial resources available to make good the material damage after terrorist attacks, the state also invests in preventive measures. Above all, this causes government spending on security and defence to rise (alongside private spending). Naturally, the security industry profits from this greatly. Even if appropriate policies are implemented to overcome the economic setback, one factor must not be overlooked: the prosperity of the country affected still suffers a major hit. Gross domestic product paints economy activity with a very broad brush. Thus, government spending on terror prevention can force up GDP, while at best maintaining the sense of security among the population at the level it would have been without the risk of terror. Accordingly, macroeconomic effects of a terrorist attack are mostly manageable in the short run, although considerable costs can accrue for smaller economies.

### **3.2 Terror and its consequences for the global economy**

The longer term, macroeconomic consequences of terror are decidedly more diffuse than simple economic effects. Fully aware that it is impossible for us bank economists to accurately predict the next terrorist attack and its macroeconomic consequences, we are nonetheless able to elucidate a number of fundamental correlations. As mentioned above, small, open emerging markets can suffer the most from the cost of terrorist attacks. How countries trade with each other is impacted by such attacks. So how does terrorism influence foreign trade and the global economy? The majority of the research into the question is devoted to the United States, taking place for the most

<sup>12</sup> Cf. Keyfitz (2004).

<sup>13</sup> Cf. Abadie/Gardeazabal (2008).

part in the wake of the terrorist attacks of 11 September 2001.<sup>14</sup> This has caused the experts to conclude that the economic effects of terror are generally negligible. But no doubt one reason why the research finding that terrorism has hardly any macroeconomic consequences is that the United States has a quite unique economy. The Americans have a very large domestic market, a stable, dynamic society and diversified industrial base. All of this gives the country enough of a cushion, even in the face of major terror effects, to facilitate a quick return to economic normality.

The situation is different for smaller economies. Their long-term growth path depends much more on their integration in the global economy. For instance, studies estimate that per capita GDP in the Basque country could have been 10% larger without the activities of ETA<sup>15</sup> or that Israel's per capita output is around 4% less than it might have been due to terror.<sup>16</sup> For many of these countries, foreign trade is one of the most important sources of income, be it exports of high-tech goods, tourism or trading in commodities. The macroeconomic cost of terror can certainly be high and relevant in the long run for more open economies, especially for those smaller emerging markets that are heavily dependent upon the global economy. In light of the fact that the global economy is becoming ever more interconnected, terror and its potential economic disruption are also becoming increasingly relevant.

As a matter of principle, terror has two channels through which it impacts an economy: it increases uncertainty and it increases trade costs – being all the costs accruing when countries trade goods, services or capital with each other. The more permanent the threat of terrorist attacks is, the more distinct such costs are. Similar effects also arise, although to a much broader extent, in the event of civil wars and guerrilla conflicts.<sup>17</sup>

Uncertainty is first spotted on the financial markets, as this is where the markets are at their most efficient, enabling to react fastest to terror-related, negative surprises. Banks and insurers in particular are affected in this context. Banks need to assess the macroeconomic risks, while insurers settle the losses incurred. Whether higher insurance premiums become the norm depends, however, on the general political and social situation in the country. If the risk of a terrorist attack being repeated is low, the surprise effect declines rapidly.

The situation is different when an attack signals deeper, broader tensions or is interpreted as possibly the start of a series of attacks (but this is not normally the case). Consumers might also be encouraged to start hoarding in the short run and rebook or delay their next holiday as potential tourists. Yet terror-related insurance effects mostly dissipate again quickly, like the clouds after a thunderstorm.

What is more important for the global economy in the medium term is terror's second transmission channel impacting the economy: rising trade costs. Figure 11 illustrates the correlation. It is normally safe to assume that technological progress, meaning inventions and improvements to existing technology, will tend to constantly lower trade costs (dotted line). 150 years ago, it was steamships and railways, 100 years ago the diesel motor, 70 years ago containerisation and air freight –

14 See for instance the textbook by Enders and Sandler (2005)  
15 Cf. Abadie/Gardeazabal (2003).

16 Cf. Eckstein/Tsiddon (2004).  
17 Cf. Sandler/Enders (2014).

## Stylised impact of terror on trading costs

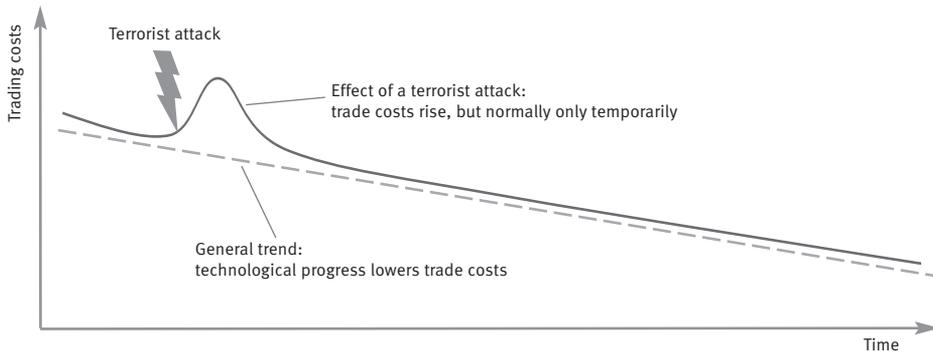


Fig. 11

Source: Berenberg.

and in the coming years probably 3D printing,<sup>18</sup> drones and others. A terrorist attack can cause the structure of trade costs to change – in an upward direction. Be it longer lead times for visas, tighter identity checks at border crossings and checkpoints, stricter import regulations, more bureaucracy, higher physical costs for transport – everything that policymakers do to prevent terror (mostly as a reaction to a previous attack) makes it more expensive to trade. In all of this, it is possible to observe how terror-related higher trade costs can also affect countries abutting the terrorised economies. Stricter security measures are often imposed on a regional basis rather than just in a single country.<sup>19</sup> The falling trade cost curve in the chart does suggest, however, that terror-related trade costs are more level effects, meaning they are one-off hits that then slowly reverse again – which is mostly also desirable from the political viewpoint. How large the »bulge« in trade costs proves to be is also a political question.

To put it in general terms, in the widest sense it is the policymakers who steer the level of globalisation by means of trade costs in their response to terror threats.<sup>20</sup>

To be able to comprehend the impact of terror via the transmission channel of trade costs, it is essential to understand how individual economies earn money on the global markets. Globalisation opens up many different ways for emerging economies to generate income, meaning they have developed varying macroeconomic business models – what is exported is what counts:<sup>21</sup>

- First, there are commodities that have helped many countries gain greater prosperity – albeit of a brittle kind – over the last few decades. But where the world buys its commodities is generally secondary; what matters more is generally the price of such goods. Where the trade and/or extraction costs rise due to stricter security measures in response to terror in a given commodity-exporting country, other commodity exporters might well jump in to plug the gap. The country affected by terror sells less of what have now become more expensive commodities in relative terms.

18 Cf. Berenberg/HWWI (2015).

19 Cf. De Sousa/Mirza/Verdier (2010).

20 Cf. O'Rourke/Findlay (2008).

21 Bandyopadhyay/Sandler/ Younas (2016), for export structures per se, Hausmann et al. (2014)

- Other countries generate substantial earnings from their tourist industry. Tourism is certainly one of the most terror-sensitive sectors, where the sense of insecurity mentioned above comes to dominate. Fears of an attack at the holiday destination often lead to rebookings and cancellations. Here, too, travel costs rise and higher costs accrue locally – just think of the tough security constraints and the time they take up when entering the United States or Israel. Where a holiday destination faces a terror threat, important currency earnings can quickly evaporate, in turn meaning they are missing from the balance of trade, thus bringing those countries that are highly reliant upon foreign capital flows into financial difficulties.
- Other countries again, mainly those in close proximity to developed economies, earn most of their money as part of cross-border chains. Such chains are generally preceded by foreign direct investment (FDI). Should trade costs rise, the upshot at first is larger inventories. Depending on how policymakers respond to terrorist attacks in individual instances, the movement of goods may be impeded. But more important in such cases are the effects of higher trade costs on cross-border movements of people. Indeed, longer entry procedures eat up more time for expensive executives. Yet relatively intensive travel by managers is essential in international value chains. Where a terrorist attack causes policymakers to enact stricter travel rules, individual countries may certainly see a fall in their attractiveness for FDI, which forms the basis for the production lines considered here.
- The higher up an economy is in the hierarchy of these value chains, the greater the share of high-tech goods in total exports. These are goods that are often less crucial, but generally also more capital-intensive to acquire.  
Where a country earns most of its foreign currency with such exports, higher trade costs for terror reasons are of little significance. More important in this regard is once again the channel of uncertainty, which causes people to put off investing in expensive capital goods in the short run. Over the medium term, though, a diversified, tech-heavy portfolio of exported products provides good insurance against such shocks. The global economy requires the goods traded by these exporting economies, as they are hard to obtain elsewhere.
- Exports of services are also playing an ever more important role. Provided this involves more than just financial services, a development path along this line is similarly relatively terror-resistant. With the exception of consulting work carried out on site, services are often not physically exported, meaning that the influence of higher trade costs – which are predominantly physical in nature – remains very low.

Developed, open economies generally apply a business model built around high-tech and services. This explains why economists typically classify terrorism as negligible in macroeconomic terms. But the outlook can certainly differ for emerging economies that rely heavily upon foreign capital and imports from the industrialised nations. Here, terrorism can definitely have a much more marked

impact on economic performance. Investment projects might no longer be carried out under permanently higher trade and security costs of various types. End users in emerging markets would buy proportionately fewer durable consumer goods, things like fridges, cars and other products that easily exceed a month's pay. In some countries, tourism is practically systemically important, meaning that a terrorist attack can knock the balance of payments out of kilter at least for a certain period of time. All the more so as, in some emerging markets, terror frequently interacts with deep-rooted social tensions and a financially weaker state. Even damage to infrastructure can have a negative effect on economic development in this way.

Terrorism can have a negative impact on economies because of rising trade costs, which means that policymakers need to respond wisely to terrorist threats. Under-investment in security can cause the risk of an attack to increase. At the same time, the financial resources pumped into security measures are not available for use elsewhere. The shifting of government spending to secure movements of people and goods is possibly not particularly efficient in some cases, driven instead by unsustainable populist motives. Just think of the sometimes extremely time-consuming interviews when entering the United States since the 11 September terrorist attacks. But there are also more current examples. The US government published a travel alert (one stage down from a travel warning) for the whole of Europe on 30 May 2016. That American business travellers will now presumably be expected to take more security training courses is only to be expected<sup>22</sup> – and security is the most important topic in business travel these days.<sup>23</sup> This raises the question of just how effective such travel actually is. There are huge doubts.<sup>24</sup>

In certain circumstances, anti-terror measures are not even worthwhile in developing countries.<sup>25</sup> This is because terrorists are able to adapt their strategy in response to predictable anti-terror policies by governments, thus evading security precautions.<sup>26</sup>

More international cooperation on surveillance and early recognition of terror risks would presumably yield a higher return, as would social investment to resolve political tensions that give rise to terrorism. In some cases, more investment in logistical security and surveillance measures may also have long-term benefits, provided they go hand-in-hand with investment in the automation and digitisation of transactions.

All in all, we gain a more nuanced picture than simply that the macroeconomic effects of terror quickly dissipate again. Terror has the potential to change some economies over the medium term as well due to trade cost effects. How large this potential is, however, depends on the business model of a national economy. Terror thus contains not insignificant macroeconomic risks specifically for less diversified, export-oriented emerging markets. Another important implication of the correlation described above is that, as technological progress advances, globalisation also tends to grow – and hence the vulnerability of the global economy to terrorist attacks. But, international cooperation, calm and far-sightedness from policymakers, central banks and other market participants can take the heat out of the terror-related cost pressure on international trade.

22 Cf. *The Economist* (2016).

23 Cf. *American Express Global Business Travel* (2016).

24 Cf. Mann (2011).

25 Cf. Egger/Gassebner (2015).

26 Cf. Brück/Wickström (2004).

## 4 The security industry from the investor angle

### 4.1 Review

Our »Security Industry« baseline study was published in the summer of 2008, shortly before the Lehman crash and the consequent upheavals in the global economy: the looming collapse of the financial system; state rescue packages that frequently stretched public finances to excess and triggered the Greece crisis, among other things, in the eurozone; and slower Chinese trend growth since 2011. The pace of global expansion slowed considerably in the wake of all this. The United States has struggled to keep annual GDP growth above 2%. Japan has stumbled from one recession to the next. Many eurozone members have not yet returned to the levels seen pre-2008.

The relevant security-related sub-markets have evolved in a totally different direction, quite unaffected by all this. Back then, we had forecast annual average growth rates of 7.8%, which would cause the market volume to roughly double from \$115 billion to \$231 billion by the year 2015. In an industry report from March 2015, the renowned US market research institute Freedonia put global spending in these areas at an estimated \$244 billion.<sup>27</sup> So our expectations have been met. At this point, we note that the statistics regarding the relevant market volumes do vary greatly. This can be attributed primarily to difficulties with definitions and associated allocation problems. Should revenues from firewall products be allocated to the IT/software industry or do they represent a separate category in the security industry? Numerous other examples could be cited.

### 4.2 Future growth drivers

The fundamentals underpinning the growth of recent years have changed little or, if anything, have become even more relevant. An overview:

- A total of 42 trouble spots around the world were counted at the beginning of 2016 (including Ukraine, Syria, Yemen, Libya, Iraq, Somalia and Nigeria, to name but a few). The rising number of refugees heading for Europe, together with the security questions this throws up, is just one of the consequences.
- So-called cyber-attacks – attacks against individuals, companies or public institutions carried out online – now cause annual financial losses worth several hundred billion dollars. One spectacular case was the »hacking« of Bangladesh's central bank in February 2016, when a total of \$81 million was »pilfered« from accounts with the New York branch of the Federal Reserve Bank via the SWIFT international payments system.
- Personal sense of security: The number of burglaries in Germany exploded by 10% to 167,000 instances in 2015 – representing 457 deeds every single day. The detection is pretty low at just 15%. The appeal on TV to »stay safe« catches the mood of the nation. Home-owners are »gearing up«.

<sup>27</sup> Cf. The Freedonia Group (2015).

At another level, the assaults carried out on women in many major German cities on New Year's Eve 2015 engendered a feeling of personal insecurity. Pepper spray was soon sold out afterwards. These stories simultaneously delineate the main sub-markets of the security industry.

#### **4.2.1 Internal security – homeland defence**

Ensuring internal security is one of the central functions of the state. The emergence of the present-day homeland defence market can be seen as a consequence of the attacks of 11 September 2001 in the United States. The main focus here was and still is on global measures ensuring the ability to seamlessly, transparently track all cross-border movements of people and goods and protect what is known as critical infrastructure (seaports and airports, energy and water supply, public buildings). But it involves far more than simply preventing atrocities to also encompass combating illegal immigration and drug smuggling. To achieve this requires conventional actions like securing external borders as well as digital identification and monitoring systems and standards for international data exchange. Europe has become a hotbed of terrorist activities since 2014, as the attacks in France and Belgium demonstrate. Inadequate prevention and faulty investigation made evident considerable deficits at almost every level. A visible expansion of government spending programmes in this area can be expected. This also holds true for measures to limit the flow of refugees through the Balkans and across the Mediterranean. For these reasons, western Europe is likely to see the highest growth rates in this segment over the next few years. The average annual increase could reach 13.4%, causing the market volume to rise from \$85 billion in 2015 to \$146 billion in 2020.<sup>28</sup> Viewed overall, however, the pace of expansion is most likely to slow. The US market is now considered relatively mature/saturated. Globally, spending could rise by an average of 5.6% each year to 2020 to reach \$364 billion.<sup>29</sup>

#### **4.2.2 Security services, protection of property and people**

Security services, and the protection of property and people, pretty much form the core or act as the »mother of the security industry«. The key concepts are the protection of belongings (alarm systems, CCTV and screening systems, access controls), armoured cars, safety at major events and public places, and so on. Around 70% of global revenues totalling some \$140 billion are generated by companies, a good 10% by institutional customers (museums, churches, schools, etc.) and the rest by private individuals. Their spending patterns vary as disposable incomes increase. Accordingly, as was already the case in the recent past, the larger middle-income countries (Brazil, Russia, India, China, South Africa, Indonesia, Philippines) will stand at the top of the growth pyramid with double-digit growth rates in the security segment.

This is where the middle classes are expanding fastest. In global terms, however, this is the area with the slowest pace of growth; annual increases of 3 to 5% can be expected.

28 Cf. Homeland Security Research (2016).

29 Cf. Transparency Market Research (2014).

### 4.2.3 Network and data protection – cyber-security

The ever increasing digitisation and interconnection of the world (Internet of Things, Industry 4.0, cloud computing) is providing fertile ground for large targets to attack for sensitive data as well as an impressive rate of growth in corresponding security solutions. The focus is on protecting critical infrastructure, networks, all types of connected terminals, software applications, and so on. To achieve this requires optimally integrated solutions that prevent unauthorised access, data theft/manipulation and deadlocked systems. Back in 2014, the annual cost of cyber crime was estimated to total around \$400 billion.<sup>30</sup> Potential victims need to respond. MarketsandMarkets, a consultancy, predicts annual market growth averaging 9.8% between 2015 and 2020, taking the volume from \$106.3 billion to \$170.2 billion. Some areas like secure cloud computing (inexpensive solution for data storage and backup for small and mid-sized enterprises) and data backup for the use of mobile communication devices (mobiles, notebooks, tablets, etc.) are likely to expand at an even faster pace.<sup>31</sup>

### 4.3 Investment opportunities/trends

The individual investor is faced with a number of companies operating in the security industry environment. The investment universe of the Pictet-Security fund, for instance, consists of around 350 companies with a market capitalisation of around \$3,100 billion. These include global players like IBM, SAP, Oracle, Microsoft, Verizon, Securitas, CSC and Symantec, as well as a series of smaller firms and niche vendors. It is almost impossible to make a separate, targeted selection. The individual company exposure, and hence possibly also loss exposure, appears too high.

In the meantime, however, there are also a number of fund products and index certificates. As a proxy for this product category, we take the SGI Global Security Index that was also introduced in our baseline study from 2008. It has one of the longest price histories that can be traced back to 2002. Below we have compared the performance of the (open-ended) index certificate issued by Société Générale with that of the German DAX stockmarket index and the EURO STOXX 50. When the present study was prepared, the index encompassed 29 companies and was denominated in euros.

The observation period commences on 1 January 2008 and ends in mid-May 2016. The starting point was indexed at 100. In both cases, the index demonstrates a far more positive performance. On 20 May 2016, the index certificate stood at 201.3 points and the EURO STOXX 50 at 67.1 points. The leading European stocks have still not recovered fully from the Lehman fallout and the sovereign debt crisis (partly due to the high weighting of the finance industry). Selected companies from the security industry have doubled their market capitalisation, while eurozone blue chips have lost a good 30% of their value.

<sup>30</sup> Cf. CSIS/McAfee (2014).

<sup>31</sup> Cf. Allied Market Research (2015).

### Performance of SGI Global Security Index/EURO STOXX 50

01/01/2008 – 20/05/2016

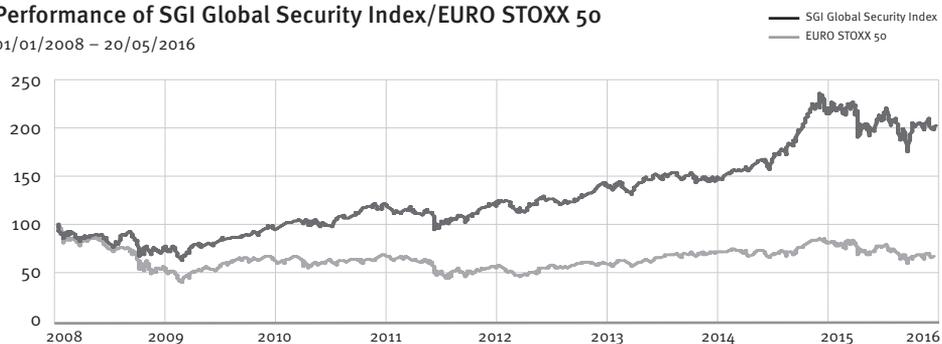


Fig. 12

Sources: Bloomberg; Berenberg calculations.

### Performance of SGI Global Security Index/DAX

01/01/2008 – 20/05/2016

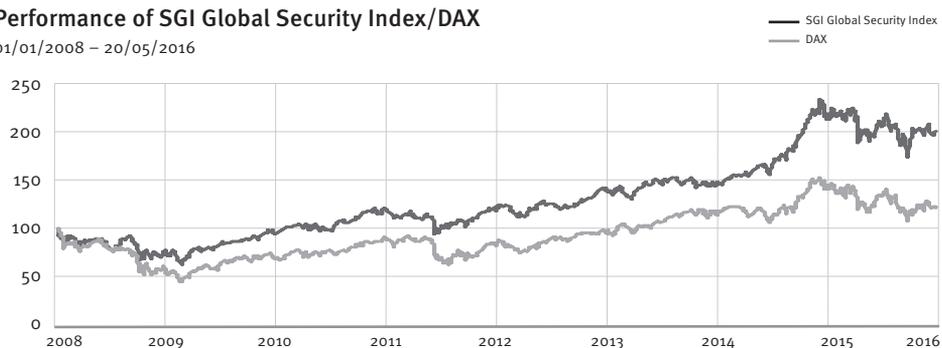


Fig. 13

Sources: Bloomberg; Berenberg calculations.

Things look somewhat brighter when it comes to the DAX. After prices in this index practically halved between summer 2008 and April 2009, a bullish mood then took hold over several years. This came to a provisional end in spring 2015. With an indexed DAX level of 122.5 points as of 20 May 2016, a striking downside deviation can also be observed here.

To conclude, it is of course impossible to project past trends into the future one-to-one. There are, however, good reasons to anticipate above-average growth rates in some parts of the security industry over the next five to ten years. We have discussed the fundamentals supporting this view. Well-managed companies should be able to profit from this in the form of higher revenues and earnings. And the area will remain a lucrative option for investors with a longer time horizon.

## 5 Conclusions

Security is set to remain one of the mega-topics of the future. Developments since the baseline study published jointly by Berenberg and the Hamburg Institute of International Economics (HWWI) on this topic in 2008 have, if anything, made the issue of security even more relevant. Some of the security risks listed back then have in the meantime materialised to such an extent that the present update of the study has taken up these issues again.

The main topics are the security situation around the world, terrorism and digitisation. What all these developments have in common is that the correlations are complex and the threat diffuse. This fact does not make the issue of security any the less relevant or acute, serving instead to boost its topicality and the need to act. In addition, security risks are evidently becoming increasingly international in nature. This calls for security measures that are more internationally coordinated and harmonised.

The security vacuum that can currently be observed is yielding a burgeoning private security market that has many diverse facets. In light of the future relevance of security and the anticipated technological innovation in security products and security services, security is and is set to remain a topic of great interest to investors.

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