BCG

REPORT

Connected Greece

The Internet as a Development Lever for the Greek Economy

THE BOSTON CONSULTING GROUP

The Boston Consulting Group (BCG) is a global management consulting firm and the world's leading advisor on business strategy. We partner with clients from the private, public, and not-for-profit sectors in all regions to identify their highest-value opportunities, address their most critical challenges, and transform their enterprises. Our customized approach combines deep insight into the dynamics of companies and markets with close collaboration at all levels of the client organization. This ensures that our clients achieve sustainable competitive advantage, build more capable organizations, and secure lasting results. Founded in 1963, BCG is a private company with 75 offices in 42 countries. For more information, please visit bcg.com.

CONNECTED GREECE

THE INTERNET AS A DEVELOPMENT LEVER FOR THE GREEK ECONOMY

VASSILIS ANTONIADES

CAMILLE EGLOFF

CHRISTINA PARASKEVOPOULOU

MARC VOS

commissioned by

Google

MARCH 2012 | THE BOSTON CONSULTING GROUP

CONTENTS

PREFACE

Although the Internet is an established fact of daily life in Greece, its economic impact is still not well understood. To capture the nature and size of commercial activity on the Internet and its impact on the Greek economy, Google commissioned The Boston Consulting Group (BCG) to prepare this report. Although the results have been discussed with Google executives, BCG is responsible for the analysis and conclusions.

Both Google and BCG are pleased to present these findings. We hope they will foster a better understanding of the Greek Internet economy and contribute to its development.

About the Authors

Vassilis Antoniades is the partner and managing director heading the Athens office of The Boston Consulting Group. You may contact him by e-mail at antoniades.vassilis@bcg.com. **Camille Egloff** is a partner and managing director in BCG's Athens office, heading the Consumer and Retail practice for Southeastern Europe. You may contact her by e-mail at egloff.camille@bcg.com. **Christina Paraskevopoulou** is a project leader in BCG's Athens office. You may contact her by e-mail at paraskevopoulou.christina@bcg.com. **Marc Vos** is a partner and managing director in the Milan office and head of BCG's Italy-Greece-Turkey Technology, Media & Telecommunications practice. You may contact him by e-mail at vos.marc@bcg.com.

INTRODUCTION

The Internet economy is far less developed in Greece than in most other European Union (EU) countries. Although many Greeks are online e-mailing their friends, getting news and sports scores, and updating their Facebook status, only a small number are using the Internet in ways that accelerate commerce or create value—making purchases, running a business, or using government services, for example. The Greeks who are most fully engaged with the Internet right now are the few—particularly young people and wealthier consumers—not the many.

Changing this dynamic represents a large opportunity and can help reignite the economy. The Internet cannot cure all of Greece's financial ills, to be sure, but its substantial impact in other countries demonstrates how it can serve as a powerful stimulus for economic growth and job creation.

The Internet can improve transparency in transactions and tax collection for the government, save consumers time and money, help businesses boost their bottom lines, and spur employment. It can create export opportunities for Greek companies by connecting them with customers all over the world. Although many small and medium-size Greek businesses have been reluctant to move aggressively online, those that have done so are using the Internet both to extend their reach and to transform their way of doing business. These include companies as varied in their markets and business models as travel retailer Airtickets and used-tire-recycler Herco.

There are real obstacles to extending the Internet's reach in Greece and thus boosting its economic impact. Infrastructure needs to be strengthened, businesses and government need to embrace the opportunities offered, and consumers need to develop new habits. Without these changes, it will be difficult to harvest the benefits provided by this network of networks.

Policymakers have a role to play, but they do not have to reinvent the wheel. Plenty of models exist: other countries have taken targeted actions and successfully developed their Internet economies. Best practices from abroad, many of which can be implemented without large expenditures, can be imported to Greece and adapted to local circumstances.

During its own severe economic crisis in the late 1990s, South Korea undertook coordinated efforts on multiple fronts to strengthen its digital economy. These ranged from government loans for Internet ser-

vice providers to computer education programs aimed at the elderly, farmers, and housewives—and other people far from the country's dense urban centers. Today South Korea ranks number one on BCG's e-Intensity Index, which compares the depth and reach of the Internet among 50 countries globally. Its Internet economy contributed 7.3 percent of GDP in 2010. Lessons from countries like these can help narrow the Internet gap between Greece and the rest of Europe and so help Greece's economic recovery.

EXECUTIVE SUMMARY

GREECE HAS NOT YET embraced the Internet as fully as most other European countries. Therein lies an enormous opportunity. The Internet can deliver much needed growth and competitiveness—driving exports, improving business productivity, and stimulating employment, especially among young people. This report examines the Greek Internet economy and also its potential.

Internet usage in Greece is generally lower than in most European countries despite both high business and mobile broadband access and smartphone adoption rates.

- Although 80 percent of Greek businesses have broadband[1] and 67 percent of all Greeks have mobile broadband access,[2] only 49 percent of Greeks are online,[3] and only 12 percent of Greeks use the Internet to make purchases (as opposed to a 40 percent average in the European Union).[4]

The Internet directly contributed an estimated €2.7B to the Greek economy, or 1.2 percent of total Greek GDP, in 2010.

- Consumer spending is the main driver, contributing €2.3B to Greek GDP. E-commerce accounts for €0.7B of consumer spending, driven mainly by online travel and electronics purchases.

The Internet economy has ripple effects on the broader Greek economy.

- The value of goods or services researched online but purchased offline (ROPO) in Greece was about €7.5B[5] in 2010—ten times the value of total Greek e-commerce.

- Online advertising is a fast-growing sector in an otherwise shrinking advertising market, reaching €73M in 2010, with an estimated 52 percent annual growth rate since 2006.[6]

Although Greece ranks low compared with other European countries on BCG's e-Intensity Index, the Internet is nonetheless making a measurable impact on several major industries.

- Despite issues of infrastructure, concerns over security, and generally low consumer usage, the Internet is still an economic force to be reckoned with. It is reshaping tourism, the largest sector of the Greek economy. Insurers are moving online, simplifying products and reducing prices to sell directly to consumers. Online banking has made inroads but remains underdeveloped.

Significant opportunities exist for small and medium-size enterprises (SMEs) to improve efficiency and increase revenues by embracing use of the Internet.

- BCG proprietary research shows that SMEs making active use of the Internet report greater revenue growth and reach a wider market than their peers that are less engaged online.

- Uncertainties about the cost, complexity, and benefits are preventing many SMEs from operating online.

BCG believes action in five areas can accelerate the growth of the Greek Internet economy by as much as 13 percentage points—to 19 percent annually through 2015, up from an expected 6 percent.

- **Providing incentives for more SMEs to go online.** Commerce thrives on the Internet. The more vibrant the marketplace, the more businesses and consumers alike want to be part of it. Policymakers can drive SMEs to make more use of the Internet in several ways, among them making company websites compulsory and requiring that transactions with the government be conducted online.

- **Improving infrastructure.** Policymakers can give telecom companies incentives to invest in wider broadband coverage, more secure infrastructure, and improved access speeds in multiple ways, including coinvestments and initiation of public-private infrastructure partnerships, as has been done elsewhere in Europe.

- **Improving consumer confidence in online purchases.** Migrating consumers to online purchasing would be a large boost to the Greek Internet economy. Many Greek consumers are concerned about the security of online transactions. Public- and private-sector ad campaigns educating consumers on how to make safe online purchases can help overcome security concerns.

- **Putting government functions online and making certain online government services compulsory.** Emphasizing e-government functions (for example, through mandatory online car registration and filing of tax forms) can create greater transparency and revenue traceability for the Greek state and give consumers and SMEs alike a strong incentive to go online as well.

- **Investing in digital education.** Despite its manifest benefits, the Internet is still intimidating to many potential users. Public awareness and skill building programs can help address this barrier. In addition, Greek schools can provide computer education, and even programming courses, to help make the next generation digitally savvy.

Implementing these measures would create the environment for new and innovative ideas to appear and succeed online, leveraging areas like tourism, where Greece has a competitive advantage. The Internet can indeed become a lever for accelerating the country's economic recovery.

References:
1. European Commission, Digital Agenda for Europe, Greece country profile, 2010, accessed 2011.
2. Ovum Mobile broadband forecast, March 10-15, 2011.
3. Economist Intelligence Unit, market indicators, 2010, accessed 2011.
4. European Commission, Digital Agenda for Europe, Greece country profile, 2010, accessed 2011.
5. Google / TNS, 2010; Euromonitor, 2010.
6. Magna Global, 2011.

THE INTERNET ECONOMY IN GREECE TODAY

The Internet has entered Greek life but not yet become part of the daily routine as it has elsewhere. Forty-nine percent of Greeks use the Internet, a level comparable to that of Italy, where 53 percent of people are online, but far behind the more heavily connected countries of northern Europe. In the U.K., for example, Internet penetration has reached 85 percent.[1]

The Greek Internet also continues to be the land of youth. More than 85 percent of 16-to-24-year-olds use the Web, as do 68 percent of those 25 to 34. At age 35, Internet usage falls off a cliff. Among people ages 55 to 64, only 15 percent are online, and in the 65-to-74 bracket, the figure drops to 4 percent.[2]

Low Internet usage rates are partly a matter of access. Forty-one percent of households in Greece have broadband (the EU27 average is 61 percent).[3] The number of household broadband connections, however, has grown significantly in the last three years, and 67 percent have mobile broadband access.[4]

Greeks approach the Internet more cautiously than other Europeans. They are happy to gather and share information, but they are reluctant to spend money online. Eighty-one percent of users go online for research, 73 percent for e-mail, 64 percent for education, and 57 percent for news.[5] Social media and news are the most visited types of websites; Google and Facebook are the most visited addresses. Local content—produced in Greek—is lacking. Nine of the ten most visited websites are foreign based.[6]

Social media are popular in Greece, as they are everywhere. Thirty-six percent of Greeks—including 75 percent of those ages 13 to 24—use social media sites. Penetration has grown by more than 150 percent since 2009[7] but still lags behind many countries where social media engage four in five Internet users.

Commerce has yet to catch on. Only 12 percent of Greeks make purchases online, as opposed to an average of 40 percent among all Europeans.[8] The number of Greek online consumers, however, is growing by 27 percent annually—double the pace of the EU.

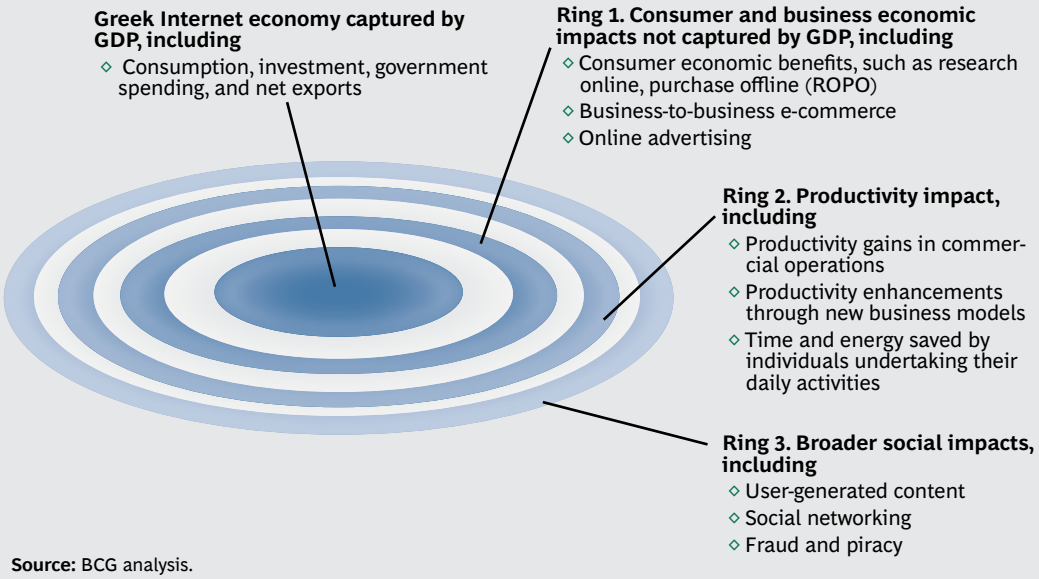
Greek businesses are much better connected than households. Some 80 percent have broadband access, close to the EU27 average of 84 percent.[9] Like consumers, however, businesses are still in the early stage of Internet adoption. They use their connections mainly for Web access or to maintain a website for marketing purposes. Relatively few companies are confident enough to accept online payments, conduct business-to-business e-commerce with suppliers and customers, or share sensitive information with partners. The few who have truly taken the

plunge have experienced transformational effects, but most of their peers are still just testing the waters.

The Internet's Impact on GDP

We have broken down the Internet's impact on the Greek economy into four categories, which are best visualized as rings emanating from a central core. (See Exhibit 1.)

Exhibit 1 | The Internet's ripples



Source: BCG analysis.

The "core" comprises those activities with a direct impact on GDP: private consumption (business and individual), private investment, government spending, and net exports. Private consumption includes both digital transactions, such as buying music online, and transactions that begin on the Internet but are delivered in the traditional brick-and-mortar world, like buying clothes from an online retailer such as buldoza.gr.

The Internet economy contributed an estimated €2.7B to the Greek economy in 2010, representing 1.2 percent of total GDP. (See Exhibit 2.)

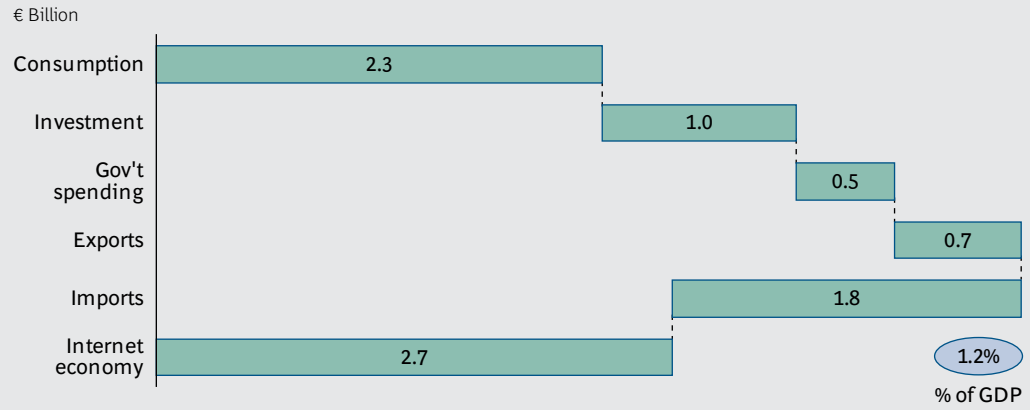
Consumption was the largest contributor, accounting for approximately €2.3B, or 86 percent. Consumers spent €1.1B on Internet access and charges. They spent an additional €700M on domestic e-commerce, including €300M on domestic online travel and €270M on online retail. They also spent €400M on hardware: €100M for cell phones and other mobile devices, and €300M for fixed technology.

Private investment in the Internet was €1B, mostly in the form of capital investment in networks by telecom companies. **Government spending** totaled €500M for infrastructure, e-government, and education, accounting for about 19 percent of the Internet economy. Subsidies of approximately €220M coming from Digital Convergence (part of the National Strategic Reference Framework, or ESPA, funding program) are also included in the reported government spending because they are purely Internet related.

Greece is a **net importer** of €1.1B of e-commerce and information and communications technology (ICT) goods and services, made up of €1.8B in imports and €0.7B in exports. Greece imports €2.6 for every €1 it exports. Fifty-seven percent of Greek consumers say they buy from abroad because they cannot find the goods they want at home.[10]

The Internet economy's share of Greek GDP, 1.2 percent, falls well below the G20 average of 4.1 percent and the EU27 average of 3.8 percent. In 2010 the Internet contributed 1.7 percent to GDP in Turkey, 1.9 percent in Russia, and 2.1 percent in Italy. At the top end of

EXHIBIT 2 | In 2010 the measurable size of the Greek Internet economy was €2.7B, or 1.2% of GDP



Sources: Ovum; Gartner; Organization for Economic Co-operation and Development (OECD); Hellenic Statistical Authority (ElStat); Eurostat; Euromonitor; Economist Intelligence Unit (EIU); Hellenic Association of Insurance Companies; IE Market Research (IEMR); International Data Corporation (IDC); Observatory for Digital Greece; Telco companies' annual reports; BCG analysis.

the scale, the U.K.'s Internet economy contributed 8.3 percent to GDP.

The Internet's Impact Beyond GDP

Beyond the core, the Internet creates ripples that move through the rest of the economy. These effects are often measurable, but they are not included (or are only indirectly reflected) in GDP calculations. For example, the Internet allows consumers to undertake comparison shopping more easily. This has led to the launch of new businesses, such as online retailer Skroutz.gr, and brought down the cost of many transactions.

These "beyond GDP" ripples are shown in the outer rings of Exhibit 1. The first ring covers the significant economic impact from three sources: business-to-business e-commerce; online advertising; and various consumer benefits, such as ROPO, the value of goods and services that are researched online but purchased offline.

ROPO. The Internet is a catalyst for about €7.5B in retail sales that start with online research and comparison shopping and are concluded in brick-and-mortar stores. This figure is ten times the value of straight e-commerce and represents 7.7 percent of total Greek retail sales. About 40 percent of ROPO is made up of cars, clothing, food, and beverages.[11] Greece has a lower ROPO as a percentage of retail sales than other European countries (16.2 percent in Germany, 12.9 percent in France, 11.5 percent in the U.K., 8.5 percent in Turkey, and 8.4 percent in Italy), another sign of the immaturity of the Greek Internet economy.

Online advertising. This is a fast-growing sector, emerging from virtually nothing a few years ago. Although Greek business has not fully embraced e-commerce, many companies have turned to the Internet as a marketing tool. Online spending is estimated at €73M, or 6.2 percent of total ad spending in 2010, up from about €14M, or 0.9 percent of the total in 2006, an annual growth rate of 52 percent within an otherwise shrinking advertising market.[12]

Business-to-business. Online commerce between businesses is negligible in Greece. Many companies, particularly more modest small and medium-size enterprises (SMEs), lack experience with the Internet and tend to overestimate the capital, technical, and bureaucratic hurdles involved in going online.

As the Nobel Prize-winning economist Paul Krugman has observed, "A country's ability to improve its standard of living depends almost entirely on its ability to raise its output per worker." Ring two in Exhibit 1 covers the impact of the Internet on productivity. Companies using the Internet can realize large productivity gains by lowering their transaction costs, accel-

THREE WAYS TO SKIN AN ECONOMY

There are three methods of calculating GDP, and none of them was designed with the Internet in mind. The output or production method measures the value created through the production of goods and services. The income method measures total income earned by individuals and companies. The expenditure method measures total spending on finished goods and services.

The output method is theoretically the best way to measure the Internet's contribution. It is how the contributions of most traditional sectors of the economy are calculated. Yet, using this method would require looking at every transaction of every good or service produced in the Greek economy and deciding whether it was considered "online" or "offline"— a process that is not practical with current data.

The income method has its own Achilles' heel. It requires multiple assumptions about the share of the income of traditional companies to be allocated to the Internet and the share of the income of multinational companies to be allocated to Greece. Those assumptions would call into question the accuracy of the final calculation.

Although the expenditure method is also imperfect, we chose to use this approach because it reveals the contributions of consumers, business, and government to the Internet economy, and it approximates the sum of the online components of all the other sectors.

The expenditure method is built on four pillars.

- **Consumption:** goods and services bought by households in Greece over the Internet, consumer spending on accessing the Internet, payments to Internet service providers, and the cost of the relevant portions of devices.
- **Investment:** capital investment by telecom companies related to the Internet and Internet-related private investments in ICT.
- **Government spending:** public ICT spending on infrastructure and supporting services.
- **Net imports:** online goods and services and ICT equipment imported, minus comparable exports.

It is important to be clear about the assumptions related to the Internet's €2.7B contribution to the Greek economy. Most significantly, the full value of goods sold online is counted because it gives a sense of the importance of the Internet as a retail channel. Most online transactions of course terminate in the physical world, so they are not purely "online," but many of them might not have taken place without the Internet as a catalyst. Data on the "online" value generated at each link in the value chain are largely unavailable, and estimating them would imply a false level of accuracy. (See the Appendix for more detail about the underlying assumptions.)

erating and simplifying business processes, and improving the flow of information—both within a company and among the company and its vendors, partners, and customers. These gains sometimes take a while to show up in economic metrics, and their size varies depending on the type, sector, and focus of the company.

Information and knowledge-intensive companies can experience gains of as much as 20 percent.[13] On average, 90 percent of services firms improve productivity by about 10 percent when using e-commerce.[14] Recent research on productivity in 13 EU countries (not including Greece) suggests that a 10 percent increase in online sales for a retail company can generate a productivity gain of about 3 percent.[15]

Within a business, some departments will benefit more from e-commerce than others. For instance, the establishment of an online shop (or a partnership with a business like price-comparison-engine Skroutz) could multiply the productivity of a remote sales department sixfold.

Among Greek SMEs that actively use their websites to market and sell online, 73 percent report an increase in their productivity due to the Internet.[16]

Ring 3 in Exhibit 1 represents the broader social effects of the Internet that are difficult to quantify, such as sharing user-generated content, using social networking, and staying connected with distant friends and family. It includes the value of e-mail, instant messaging, Internet telephony, and social networking. In Greece, 3.6 million people, more than 33 percent of the population, have Facebook accounts.[17]

Not all of the change brought by the Internet is welcome or benign. A connected world is also a world with unwanted "spam," content piracy, identity theft, and online fraud. According to the most recent Microsoft Security Intelligence Report, more than 90 percent of e-mails worldwide are unwanted.[18] Despite this, consumers who embrace the Internet put a great deal of value on it and often cannot imagine life without it.

References:

1. EIU data, 2010, accessed 2011.
2. Observatory for Digital Greece, Internet usage by Greeks, May 2011.
3. European Commission, Digital Agenda for Europe, Greece country profile, 2010, accessed 2011.
4. Ovum Mobile broadband forecast, March 10-15, 2011.
5. Observatory for Digital Greece, Internet usage by Greeks, May 2011.
6. www.alexa.com, accessed February 2012.
7. Observatory for Digital Greece, Internet usage by Greeks, May 2011.
8. European Commission, Digital Agenda for Europe, Greece country profile, 2010, accessed 2011.
9. Ibid.
10. Survey by Civic Consulting, Consumer market study on the functioning of e-commerce and Internet marketing and selling techniques in the retail of goods; Final report, part 1: Synthesis report. Prepared by Civic Consulting; subcontractors: TNS Opinion, Euromonitor International, September 2011.
11. Google / TNS, 2010; Euromonitor, 2010.
12. Magna Global, 2011.
13. DG Information Society and Media, MICUS, The impact of broadband on growth and productivity: A study on behalf of the European Commission, 2008.
14. Ibid.
15. Eurostat, Information Society: ICT impact by linking data from different sources, 2008.
16. BCG SME survey.
17. Observatory for Digital Greece, Internet usage by Greeks, May 2011.
18. Microsoft Security Intelligence Report, Volume 11, An in-depth perspective on software vulnerabilities and exploits, malicious code threats, and potentially unwanted software in the first half of 2011.

INTERNET INTENSITY

PRECURSOR TO ECONOMIC IMPACT

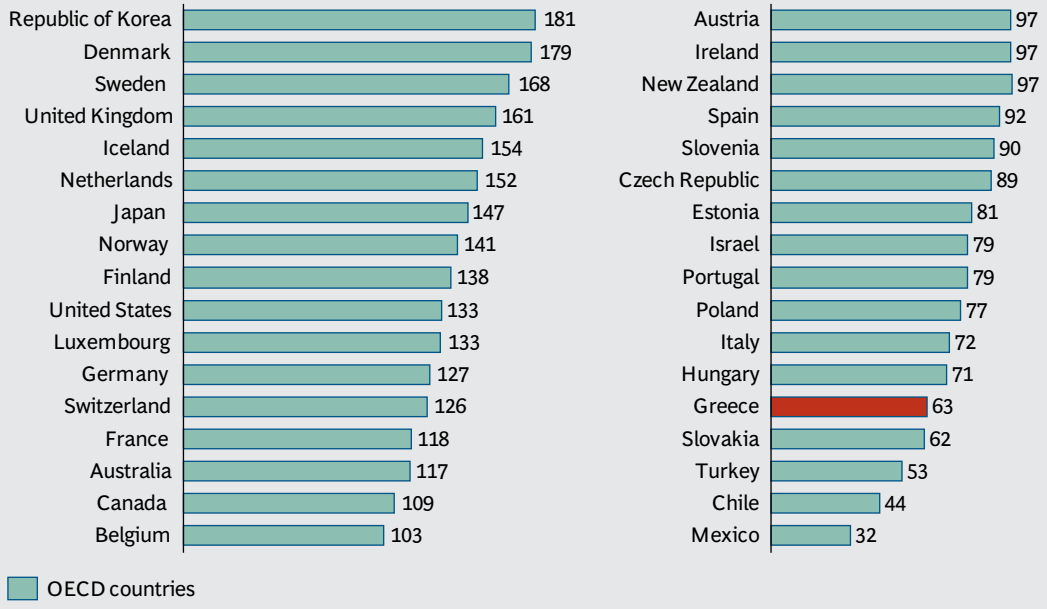
The BCG e-Intensity Index measures the depth and reach of the Internet in commerce and society among 50 countries globally. It comprises the following three gauges of Internet activity: enablement (50 percent weighting), expenditure (25 percent weighting), and engagement (25 percent weighting).

In a Global Context

With a score of 63, Greece ranks thirtieth of 34 OECD countries and trails all European countries other than Slovakia and Turkey. (See Exhibit 3.)

Greece also ranks low in all three subindices. (See Exhibit 4.)

Exhibit 3 | Greece lags behind most OECD countries in BCG's e-Intensity Index score



Sources: ComScore; EIU; Euromonitor; Gartner; International Telecommunication Union; Ovum; Pyramid Research; Speedtest.net; United Nations; World Bank; World Economic Forum; Akamai; Eurostat; Information Technology & Innovation Foundation; OECD; MagnaGlobal; BCG analysis.
Note: The index is scaled so that the geometric mean is 100 for 34 OECD members.

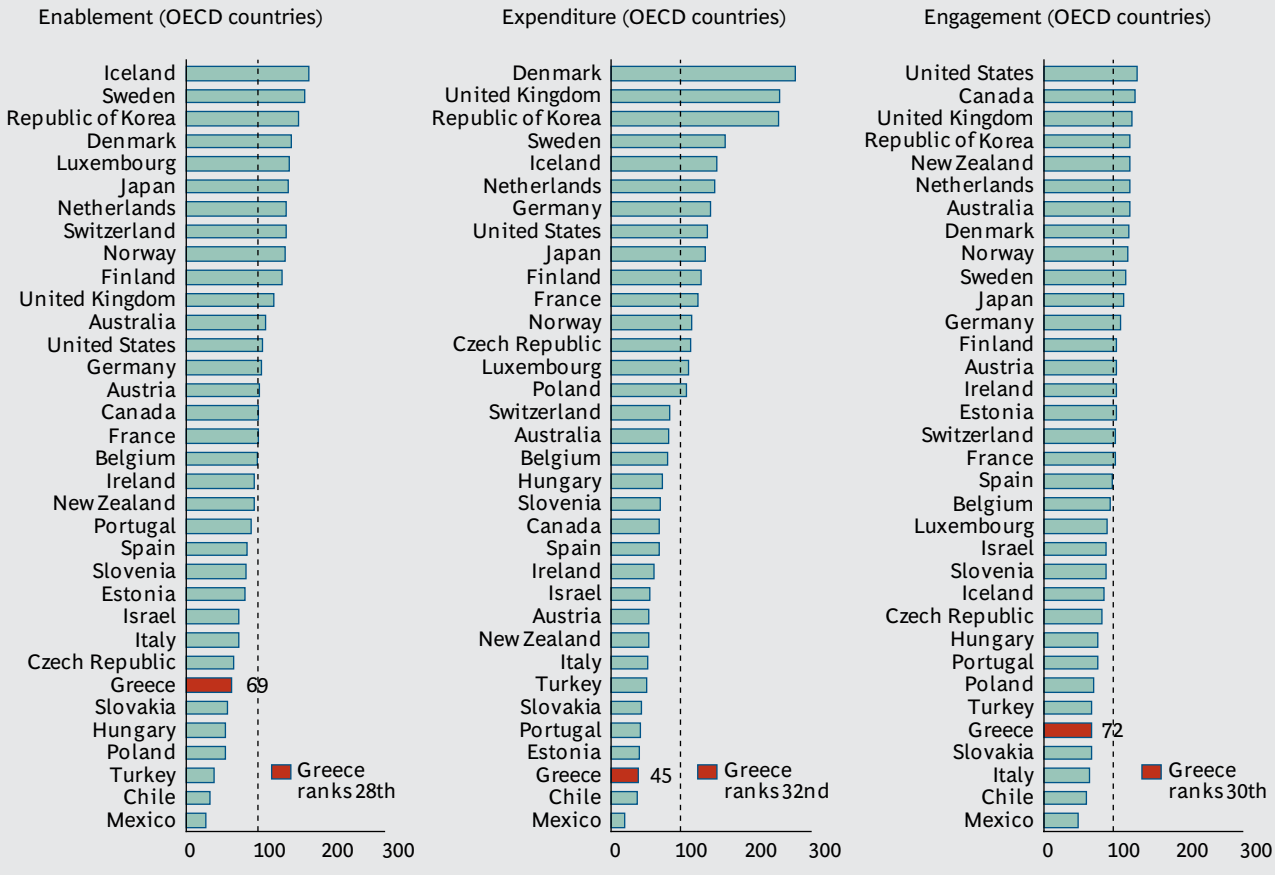
Enablement: how good is the Internet infrastructure, and how available is Internet access? Greece's low enablement score—about half the EU average and twenty-eighth of 34 OECD countries—is mainly the result of relative assessment pointing at less secure servers, lower bandwidth, lower upload or download speeds, and lower household broadband penetration. These have obvious consequences for e-commerce and Internet use in general. Lower bandwidth prevents the development of complex online services, while less security exposes users to high levels of malware and fraud.

One bright spot is the relatively high level of smartphone penetration, which at 30 percent is close to the EU15 average of 36 percent.[1] This may indicate an opportunity for Greek Internet users to move quickly to smartphones as their predominant means of accessing the Internet, as is occurring in many markets around the world.

Expenditure: how much money are consumers and businesses spending on e-commerce and online advertising? Greece ranks thirty-second, with about 1 percent of retail spending taking place online versus an EU average of 3.6 percent.[2] Low online consumer expenditure is attributable mainly to security concerns and a persistently strong preference for cash purchases and purchases made in person.

About 6 percent of Greece's ad spending is online.[3] Many Greek businesses are still not convinced of online advertising's ability to move products. Nearly 40 percent of SMEs that do not have an online presence are unsure of the effectiveness of Internet marketing.[4]

Exhibit 4 | Greece performs low across all three e-intensity subindices



Sources: ComScore; EIU; Euromonitor; Gartner; International Telecommunication Union; Ovum; Pyramid Research; Speedtest.net; United Nations; World Bank; World Economic Forum; Akamai; Eurostat; Information Technology & Innovation Foundation; OECD; MagnaGlobal; BCG analysis.
Note: The index is scaled so that the geometric mean is 100 for 34 OECD members.

These factors are linked: the reluctance of some SMEs to go online prevents them from realizing the benefits and developing further Internet capabilities. Low business penetration undermines consumer usage, which discourages infrastructure investment, and that raises a barrier to SMEs going online. Breaking this cycle is a key challenge for policymakers.

Engagement: how actively are governments, consumers, and businesses embracing the Internet? Greek users go online mainly for entertainment, e-mail, news, social networking, and gaming. Few make purchases. Similarly, few businesses use the Internet for transactions: only 10 percent of Greek businesses buy online, whereas the EU average is 28 percent.[5] Government engagement is also low. Just 16 percent of Greeks have used the Internet to interact with their government.[6]

Levers for Improvement

A sharp focus by policymakers on enablement and engagement can drive higher expenditures and bring Greece closer to average EU e-intensity levels within a few years. Low enablement scores can be improved by action in the four areas in which Greece ranks lowest: secure servers, bandwidth, network speed, and household penetration. Providing incentives to telecom companies to further improve infrastructure quality, security, safety, and speed, as other European countries have done, is essential to encouraging greater business and consumer use. It will also extend the Internet's reach into underserved rural areas. In 2010, for example, Finland required Internet service providers to make connections of at least 1 megabit per second available to any household in the country. At the same time the Finnish government launched a project to connect all Finns to the Internet with fast fiberoptic or cable networks by 2015.[7]

Low engagement scores can be boosted by increasing the scope and quality of online government information and transaction services and by providing more incentives for companies to do business online. Programs that educate citizens and businesses about e-government and increasing Internet penetration in schools will help engage the public. Government can also help draw citizens and businesses online by moving its own functions (for example, birth certificate registration and retrieval, car registration, tax forms) to the Internet. This will also create cost efficiencies for the government and increase transparency and transaction traceability, making tax evasion more difficult.

References:

1. Gartner, Mobile device forecast 2Q2011 (percent of premium devices / total devices sales).
2. Euromonitor; BCG analysis.
3. Magna Global, June 2011.
4. BCG SME survey.
5. UN Information Economy Report, 2011; European Commission, Digital Agenda for Europe, Greece country profile, 2010, accessed 2011.
6. European Commission, Digital Agenda for Europe, Greece country profile, 2010, accessed 2011.
7. "As world first, Finland makes broadband service basic right," AFP, July 1, 2010—as seen in Google.com.

THE PAYOFF

GREATER GROWTH THROUGH INDUSTRY TRANSFORMATION

The Internet has the potential to reshape Greek companies and industries via five fundamental transformational levers:

1. *Geographic expansion into new markets without the need for a brick-and-mortar presence.* Tyres Herco is a Greek tire-recycling business that does all of its buying and selling online. This has allowed the company to sell rubber granules and other materials in 39 countries and grow despite a weak domestic market.

2. *Cheaper and simpler products for consumers.* Insurance has long been a necessary evil, a product everyone needs but few understand. As part of its online strategy, auto insurer @nytime has developed simplified, lower-cost products that do not require a broker's explanation.

3. *Greater collaboration with customers and partners.* Online real estate service Spitogatos allows consumers to check listings and to upload ads for their own properties. It also brings real estate agencies together online and gives them the ability to manage their individual businesses more effectively through online procedures and software.

4. *Profitable sales of "long tail" products—specialty items marketed to small groups of consumers.* Online retailer Yiam successfully sells a large selection of traditional Greek foods like sauces, marmalades, pastries, and appetizers.

5. *Improved automation and information exchange across supply chains to increase efficiency and productivity.* The online job search service Kariera provides online resumé management and administration for companies that use it to post job listings.

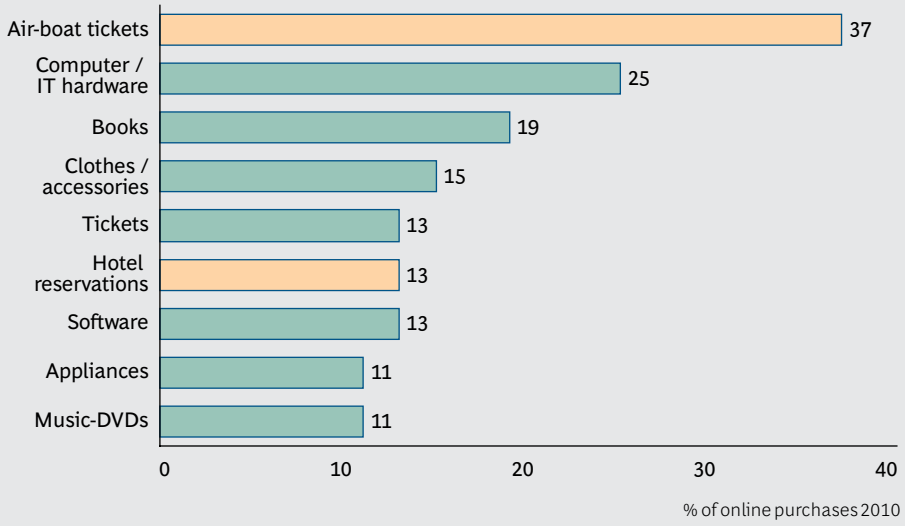
The impact of these lessons can be seen in three key industries that are in differing stages of Internet adoption and development.

Reshaping the Tourism Sector

With estimated revenues of €9.6B,[1] tourism is the largest component of Greek GDP (15 percent in 2010). It is also the biggest generator of e-commerce, contributing about €525M[2] to the Greek Internet economy, of which travel spending by Greeks accounts for €300M and the remaining €225M comes from foreign visitors. Greece attracts approximately 15 million tourists each year, an impressive 1.5 times the domestic population. (See Exhibit 5.)

Companies in the travel and tourism sector face a challenging dichotomy: they must tailor their offerings to both foreign consumers who are comfortable buying online and Greek consumers who are much less so. The

EXHIBIT 5 | Tourism is the largest e-commerce component in terms of percent of online purchases



Sources: *Naftemporiki* newspaper; Focus Bari, May 2011.
Note: Responses to the question "What have you purchased online in the last six months?" More than one reply possible.

Internet is now the most popular travel decision-making tool in Germany, the U.K., France, and Italy, the countries that send the most visitors to Greece. The value of online sales through Greek agents and tour operators has been growing at a remarkable 45 percent annually.[3] This is creating new business and growth opportunities.

Many Greek travelers still prefer to deal with brick-and-mortar travel agents. Although they buy their tickets with cash, they go online to post comments about their flights, hotels, and other experiences via social media and at review sites like Travelstories. These comments are having an impact. Hotels ranked "best in class" can get three to four times as many bookings as lower-rated competitors. Travel-service operators are being dragged online whether they want to go or not by the need to manage their reputations in such interactive forums.

Other changes are afoot as well, driven by the ability of connected consumers to choose whom they want to do business with and buy through: travel agents or, more frequently these days, directly with hotels, airlines, and others service providers with online sales channels. Even smaller hotels, such as Anastasis Apartments or Pliadongi (profiled later in this report), now have global reach, which simultaneously expands their business and reduces dependence on travel agents.

Customers increasingly put together their own mix of services, rather than choosing ready-made holiday packages. This has created opportunities for online agents who offer selections of services to choose from. They face less risk than agents who sell packages because they do not need to charter flights or prebook and prepay hotels.

Visitors have also started using the Internet to plan activities during their holiday. Leveraging this trend, museums such as Athens's Benaki Museum are investing heavily in their online presence.

Traditional brick-and-mortar agents like TUI Hellas, one of the largest travel agents and tour operators in Greece, have launched online operations sharing the market with upstart online agents like Youtravel.com. In 2010, 24 percent of TUI Hellas's bookings were made online.[4]

The tourism business in Greece is still only beginning to tap the potential of the Internet. There are multiple ways it can enable further growth:

- Small businesses can group together

online by theme (for example, agrotourism) to promote a common brand.

- Communities of service providers can launch joint online marketing and sales efforts (for example, hotels in the Cyclades islands).

- Individual businesses and communities can use social media to manage their reputations and attract new customers.

Policymakers can help. The government already uses the Internet to promote Greece globally. It can empower and train smaller players and communities to take on such initiatives, too. Policymakers can also work to remove market barriers to Greek tourism—for example, attracting more low-cost airlines, which favor the Internet as a marketing and retail channel.

Disruption, with More to Come, in Insurance

The insurance business has been a recurring target of Internet-driven disruption around the world as new, online companies have appealed directly to consumers, especially in the commodified car-insurance line, taking business from established companies on the basis of price, service, and marketing clout. Traditional companies have responded by moving online as well. In the U.K., where the online insurance market is among the biggest in Europe, 74 percent of the market for new auto policies had moved online by 2010.

Emerging just two years ago, the Greek e-insurance market grew to €45M in 2010, driven by direct online sales of car insurance products. It is still a small part of the total, representing about 2 percent of the car insurance market and about 1 percent of the total insurance market.[5] But it is growing.

Interamerican Group, for example, started its @nytime online insurance business in 2008 despite some doubts that the Greek market would support an Internet insurer. Interamerican put the entire @nytime value chain online, a big cultural gamble that meant taking some functions (for example, sales and claims management) away from agents. The company courted consumers with an aggressive ad campaign emphasizing speed and simplicity. It is now the largest online insurer in Greece. In 2011 @nytime created 60 new online positions, without cutting any jobs in its offline channel.

The Internet has increased product and price transparency in what has traditionally been a complex and opaque market, empowering consumers to do their own research rather than depend on agents—and pocket the savings. Online aggregators have responded by offering a full range of products with easy-to-understand price and features comparisons.

Direct online insurance retailing has led to new, simpler, and less expensive products. Online sales have driven prices down by as much as 20 percent via three key levers: no commission paid to third parties; lower operating costs; and better risk selection as customers choose products that are right for them.

Demand for less expensive products has already resulted in lower average commissions paid to agents. Car-liability-insurance commissions, for example, dropped from 22 percent in 2009 to 19 percent in 2010.[6] Agents and brokers are responding by moving up the value chain, focusing on an advisory role for higher-end products that are more complex and require customization, leaving more room for online to make inroads.

Big Opportunities in Banking

The Internet has not penetrated banking as deeply as it has tourism or insurance. There are no Greek online-only banks yet, but international Internet-banking players have recently opened online branches in Greece. One is Saxo Bank, an investment bank specializing in online transactions and investments. All the major Greek banks have established online platforms (like National Bank of Greece's i-bank, Eurobank's e-banking, and Piraeus Bank's winbank) and have incorporated their online channels into multichannel strategies.

Like insurance, online banking is growing rapidly. The number of online banking customers is rising at a rate of 15 percent annually, driven

THE ENGINES OF THE INTERNET ECONOMY

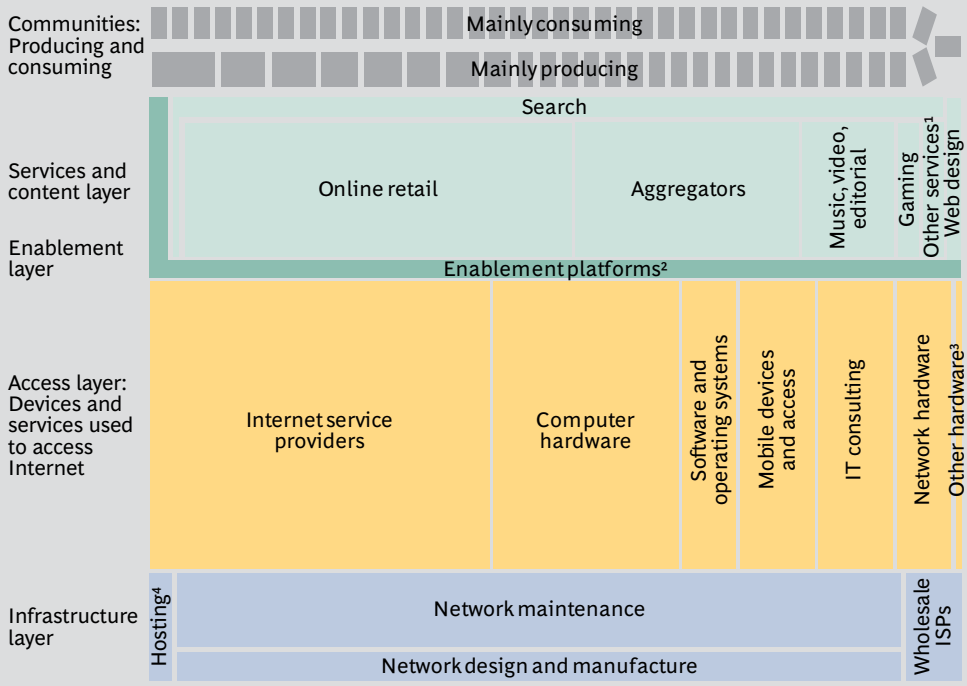
The Internet is made possible by a group of companies that provide its technical foundation. BCG estimates that in Greece these companies employed 17,300 people in 2010, about 0.4 percent of total employment, which is relatively low compared with that of other EU countries. (In the U.K. the figure is 0.9 percent of total employment; in Italy, 0.7 percent; in Denmark and Belgium, 0.6 percent; and in the Czech Republic, 0.5 percent.) This is further illustration of the immature nature of the Greek Internet economy.

Together these companies powering the Internet can be described as a "stack." In information technology, a stack is a set of layered hardware and software; each layer can be swapped out and can communicate with the layers above and below it. At the bottom is the physical infrastructure. Each higher layer contains a related horizontal set of activities. In Exhibit 6, the size of the blocks corresponds to the estimated total revenues of the companies within them. Only companies with a physical presence in Greece were considered in this analysis.

The Greek stack is composed of four basic layers.

- **Services and Content.** The services-and-content layer contributes about 20 percent to stack employment. The vast majority of that comes from online retailers and aggregators; other types of online services generate very low revenues and employment.
- **Enablement.** The enablement layer, which includes small but critical

EXHIBIT 6 | The Greek stack



Sources: Ovum; Gartner; OECD; Elstat; Eurostat; Euromonitor; EIU; Hellenic Association of Insurance Companies; IEMR; TelCo companies' annual reports; IDC; Observatory for Digital Greece; BCG analysis.
Note: Size of boxes is proportional to estimated revenues of companies in that part of the stack.
[1]Advertising agencies, dating, social networking.
[2]Billing and payments, advertising networks and servers, analytics and metrics, verification and encryption.
[3]Game consoles and other Internet-enabled devices.
[4]Including Web hosting, domain name registration and trading, and mirroring and content management.

THE ENGINES OF THE INTERNET ECONOMY (continued)

services like encoding, employs less than 1 percent.

- **Access.** The access layer, composed mainly of Internet service providers like OTE, Forthnet, and Hellas Online, accounts for 50 percent of Internet employment.
- **Infrastructure.** The infrastructure layer employs about 30 percent of the employees in the Greek stack.

largely by an increase in banking via mobile phones. There is plenty of room for growth—only 13 percent of Greek Internet users made e-banking transactions in 2011, versus 52 percent on average in the rest of the EU.[7]

The Internet is making its impact felt in other ways. It has become a consumer learning tool, increasing product and information transparency. Thirty to forty percent of Internet users now go online for financial product research, and financial institutions have responded by investing in tools to facilitate website navigation and offering easy-to-understand products with clear terms and conditions.

The pressure on banks to cut costs will accelerate growth in online transactions. Online customers are as much as ten times less expensive to service than branch customers. The average transaction cost of the most frequent transactions online is €0.1, versus up to €1.2 in branches. Moving a significant volume of transactions online will enable branches to focus on higher-value-adding advisory services.

Online banking has created newfound efficiencies for small businesses in areas such as payroll, payments to third parties, fees for transfer services, online government payments (for example, VAT), and more secure payments (online tokens have proved safer than signed paper documents).

Despite clear efficiencies and benefits, accelerating the growth of what is still an immature market will require addressing the key factors holding back e-banking in Greece. These include potential channel conflicts, consumer security concerns, and lack of online capabilities.

The government can help—and benefit at the same time. By encouraging online transactions, the government can increase traceability and reduce tax evasion. Policymakers should seek ways to do the following:

- Provide incentives for day-to-day Internet use and online business transactions, including e-billing, e-invoicing, and e-government.
- Extend online government procurement and transactions—for example, making online Social Security contributions possible and online VAT collection compulsory.
- Make electronic payments mandatory for businesses to reduce their dependence on cash transactions and increase visibility and traceability.

The shift of consumers to mobile devices can be a further opportunity to accelerate their migration to e-transactions. About 30 percent of e-banking users have switched to or added mobile banking applications within the last year.[8]

References:

1. Association of Greek Tourism Enterprises (SETE), 2010, accessed 2011.
2. Tourism sector interviews; Euromonitor International, "Travel Retail—Greece," May 2011; BCG analysis.
3. Euromonitor International, "Travel Retail—Greece," May 2011.
4. Ibid.
5. Industry interviews; BCG analysis.
6. Ibid.
7. European Commission, Digital Agenda for Europe, Greece country profile, 2010, accessed 2011.
8. Industry interviews; BCG analysis.

THE OPPORTUNITY FOR SMALL AND MEDIUM-SIZE ENTERPRISES

The Internet creates growth opportunities for businesses, and SMEs have the most to gain. By using the Web, they can engage customers and partners all over the world and do business with them quickly and cheaply, effectively leveling the playing field with much larger competitors. Although some Greek SMEs have leveraged the Internet to grow and transform their businesses, others have made only limited use thus far.

According to the results of a recent BCG survey, Greek SMEs fall into four categories in their approach to the Internet.

"High-Web" companies (8 percent of Greek SMEs) have their own websites and market and sell their goods or services extensively online.[1] The tourism industry has the highest percentage of these firms. Even the most active Greek companies, however, are using a more limited portfolio of Internet tools than their counterparts in other countries.

"Medium-Web" companies (43 percent) have an online presence and either market or sell their goods online.

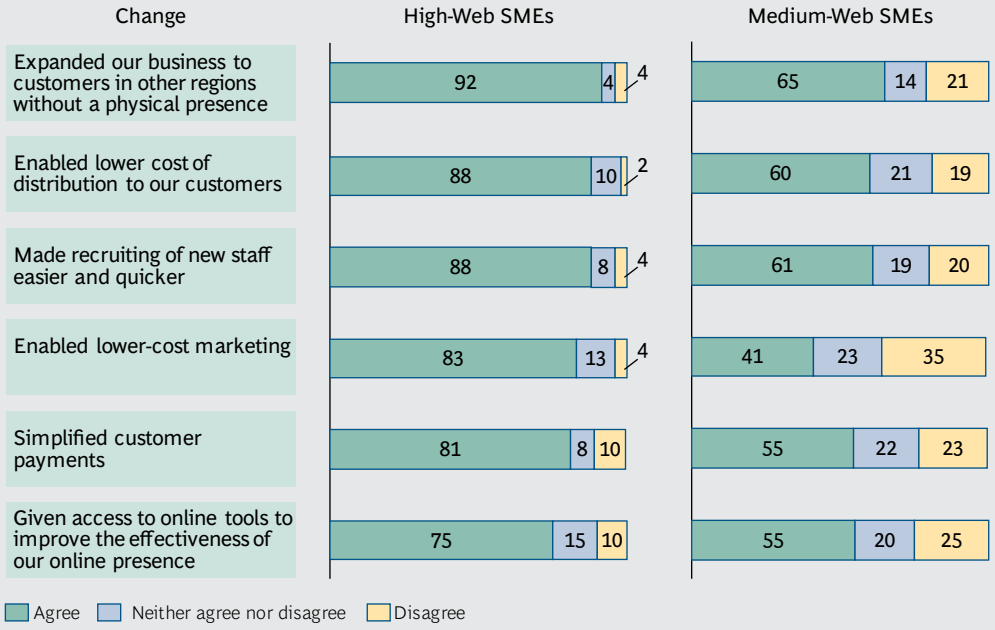
About 31 percent are **"low-Web"** companies, meaning they have a website, blog, or social media presence but are not doing any marketing or selling online. The remainder (18 percent) have **no Web** presence at all.

High-and medium-Web SMEs surveyed by BCG see three main benefits of the Internet: a much broader market reach, including to other countries, without need of a physical presence; lower cost of distribution to customers; and lower marketing costs. (See Exhibit 7.)

For high- and medium-Web Greek SMEs, search engine advertising and online directory listings are the preferred marketing activities over e-mail or banner advertising. (See Exhibit 8.) Almost half these companies have a page on a social networking service (for example, Facebook), and one in three engages interactively with customers through online reviews and comments. One in five posts a company blog or uses microblogging sites or links to social networks. A third offer online ordering. Even during the worst of the financial crisis, high- and medium-Web SMEs have been more likely to grow revenues and reach a wider market geographically, and high-Web SMEs have seen the greatest increase in employees and productivity. (See Exhibit 9.)

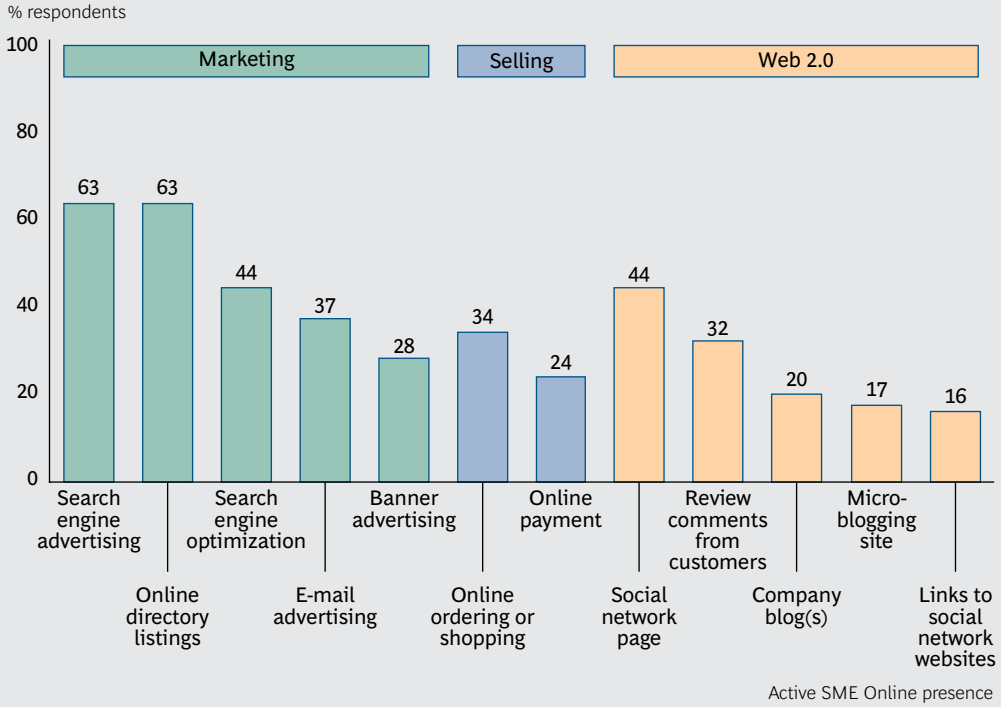
Even the no-Web SMEs surveyed agree that the Internet is the best way to communicate with customers about their products and services. The principal factors keeping these companies offline are uncertainty and misconceptions about the cost and the complexity of establishing a Web presence. In addition to publicizing the tax incentives already in place, policymakers could give hesitant SMEs a push by making

Exhibit 7 | Expanding business to regions without physical presence is the main benefit of the Internet for Greek SMEs



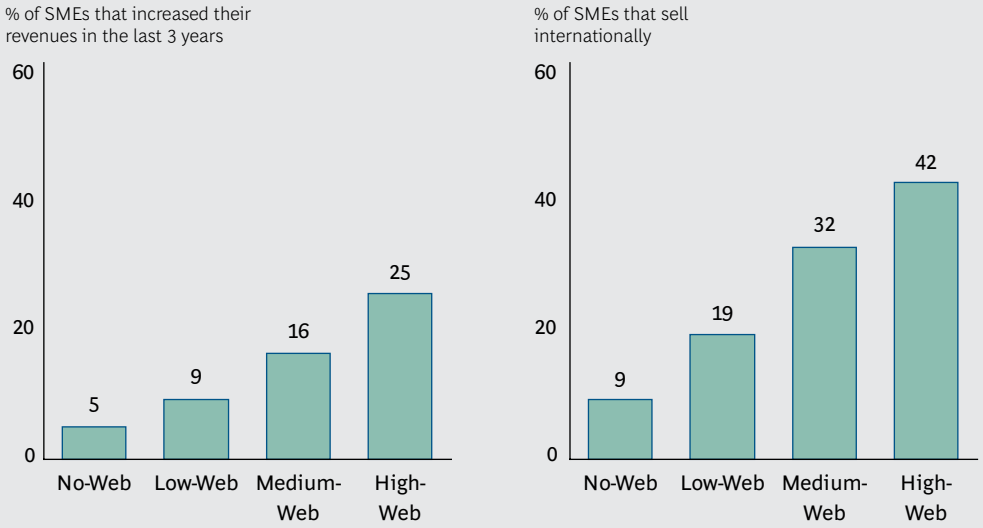
Sources: BCG survey of 500 SMEs (48 of which were high-Web businesses and 256 of which were medium-Web businesses); BCG analysis.
Note: Responses to the question "How much do you agree that the Internet has changed your business in the following ways?"

Exhibit 8 | Medium- and high-Web SMEs are taking advantage of marketing and sales via the Internet



Sources: BCG survey of 500 SMEs (304 of which were high- and mediun-Web businesses); BCG analysis.
Note: Responses to the question "Does your company use any of the following marketing, selling, or Web 2.0 tools?"

EXHIBIT 9 | High-Web SMEs have been less impacted by the crisis and reach a wider market



Source: BCG survey of 500 SMEs; BCG analysis.

some minimum online presence compulsory (Turkey has enacted legislation mandating this) and providing incentives for online migration through programs to assist with domain purchasing and website development.

REFERENCE:
1. The weighted survey results reflect the distribution of SMEs of two to 250 employees in Greece.

A GREEN BUSINESS WITH INTERNATIONAL CLIENTELE

Tyres Herco SA is clean-tech factory that started operating in 2008 in Patras, Greece. It helps solve one of the most demanding ecological problems in the world by recycling end-of-life car and truck tires into useful products. Recycled tires are turned into a multitude of goods like playground floors, shoe soles, automobile parts, road surfaces, and FIFA-approved football fields. With intelligent use of state-of-the-art technologies, Herco guarantees zero pollution.

At first, Herco sold through brokers, who received part of the sale price as commission. Within months, however, founder and venture capitalist Onic Palandjian and his team recognized they could come closer to their customers via the Internet. "As soon as we realized we could avoid brokers and offer better service and better value to customers worldwide by using the Internet, we built our whole business model around it," Palandjian says. Now Herco operates strictly online. This model allows the company to offer lower prices and reach far more potential customers than its offline competitors. Herco now sells to 39 countries in five continents and has tripled its revenues since 2008. Although Herco is an early-stage company, it has not only survived the crisis, it has been adding customers. In 2011 it recycled approximately 1.3 million tires, making it the most efficient tire-recycling factory in southeastern Europe.

EXPANDING CUSTOMER REACH AT LOWER COST

When the employment services company Kariera began life in 1997 there were only two proven ways to connect job seekers and employers: print ads and face-to-face events like job fairs. Kariera's founders, who were still university students at the time, used both, publishing magazines targeted at students and organizing campus career-development days. In 2001, they ventured onto the Internet, which gave them far greater reach at less cost. U.S.-based CareerBuilder has since acquired the company.

Managing director Alex Fourlis says, "Without the Internet we probably would have shut down. Offline businesses cannot survive in our sector." Eighty-five percent of the company's €2.2M 2011 revenues came from its online operations. In 2011, 12,000 people found jobs through the site, and 200,000 have found work via Kariera since 2000.

A RETAIL CHANNEL CREATED BY THE INTERNET

While the Internet has transformed many kinds of business, some have been entirely created by it. Airtickets was launched in 2000 by general manager Dimitris Kontogeorgos, who decided to forgo the job security he expected to find as a teacher to become an Internet entrepreneur. Visitors to Airtickets can quickly find and book their own plane tickets, hotel rooms, and rental car reservations. Kontogeorgos says, "The Internet allowed us to open our business, otherwise we never would have entered the sector." In 2000 Airtickets handled one booking a week. In 2012, the company expects 1,500 per day. In 2009 the company had 20 employees; today it has 70. Kontogeorgos says the crisis has actually been a help to his business, as price pressure has driven travelers away from traditional travel agents who offered packages and charged commissions and toward the Internet, where customers can cheaply mix and match their own arrangements. Airtickets' turnover has been growing at 60 percent annually over the past three years, and in 2011 reached €110m.

A BUSINESS MODEL MATURING AS THE INTERNET DOES

Skroutz is Greece's leading retail price-comparison engine. Consumers look for an item they want on Skroutz or its affiliated sites (Insomnia, Gameover, and Soby) and see the prices offered by Skroutz's 690 online retail partners throughout Greece. Skroutz also offers tools for online retailers. Founded in 2005, Skroutz's business model has changed as the Internet has matured. At first, it charged companies a fixed annual rate to list their products. Now it charges companies per click and according to product category. In 2011 it averaged 1.7 million unique visitors per month. The company has 33 employees, more than three times what it did in 2009. Chief technology officer and vice president of the board Vasilis Dimos is convinced the Internet is a critical tool for Greece's recovery: "We believe that during the crisis you should not close yourself down; you should invest further."

TRIPLE THE ONLINE REACH OF ITS COMPETITORS

Pliadongi is a resort hotel and spa at Trikala Korinthias in the mountains about an hour and a half's drive from Athens. Owner and CEO Vlasis Polichronopoulos says, "It is not possible today to operate in the tourism industry without a website. We have invested a lot in our website and social media." The site attracts about 12,000 visitors per month, on average. The resort generated almost 15 percent of its 2011 revenue via online sales—about three times that of other Greek resorts. It could be even higher, Polichronopoulos believes. "Greeks do not fully trust the Internet for online transactions," he says. "In Greece we have not yet made full use of the Internet in entrepreneurship, but it is now time for us to catch up."

AN UNTRADITIONAL CHANNEL FOR TRADITIONAL FOODS

The Women's Agricultural Cooperative of Traditional Products St. Anthony (Aianton) was founded in 1999 by the women of Agios Antonios, a small mountain village of 1,000 people about 35 kilometers from Thessaloniki. As the village's traditional farming base eroded, its women decided to do what they could to make up for lost income. With state and EU help, they began selling traditional home-cooked foods to retail shops. In 2007 they created a website and in 2008 opened their own café and shop. The cooperative has 14 employees. Although the cooperative does not sell any of its goods online (consonant with the strong Greek preference for researching online but purchasing offline), the cooperative's Soula Karamali believes Aianton's Web and social media presence has helped it reach more customers and weather the crisis. "Without the Internet," she says, "we would be down 40 percent."

BRINGING REALTORS TOGETHER ONLINE

Spitogatos.gr is an online real-estate-listing service launched in 2006 by four young professionals, who at first treated it almost as a hobby. By 2009, however, they had attracted investments from venture capitalists. The business expects to break even in 2012. It has 20 employees, up from six in 2009. At first, Spitogatos emphasized generating content and brand building over revenues and charged real estate agencies for website templates and featured listings. Now it generates revenues from banner ads, membership fees from agencies (it expects to have over 1,000 paid registered members in 2012), fees from featured listings and lead generation, and has also expanded in the holiday rentals and home improvement sectors. Managing director Dimitris Melachroinos says, "The Internet enables us to do business cheaper, better, and faster."

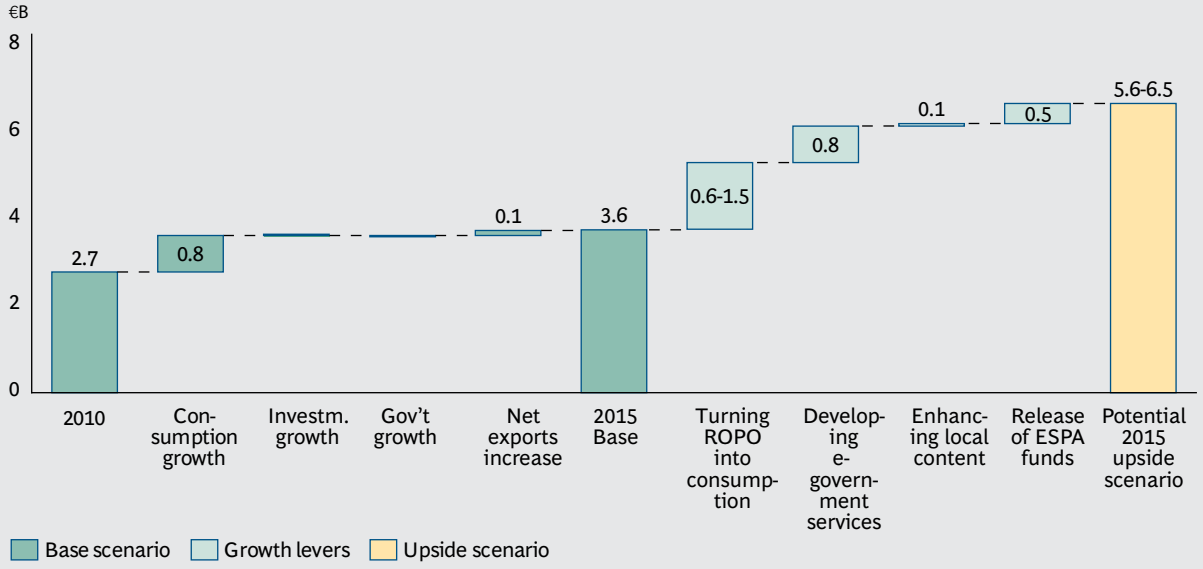
LOOKING FORWARD

THE FINANCIAL CRISIS HAS hit the entire Greek economy hard, and the Internet is no exception. Near-term growth is likely to be slow. BCG expects the Greek Internet economy to grow by 6 percent annually, reaching €3.6B, or 1.6 percent of GDP, by 2015. This is still far behind the rest of Europe. We believe, however, the opportunity exists to boost Greek Internet-economy growth by 13 percentage points over the base case—to 19 percent annually—with a handful of relatively straightforward steps. We estimate this could add as much as €2.9B to the Greek Internet economy, bringing it to 2.9 percent of total Greek GDP by 2015. (See Exhibit 10.)

Business Incentives

Greek retailers across the economy need to be encouraged to go online. Content and

EXHIBIT 10 | Undertaking the right initiatives can drive significant additional growth in the Greek Internet economy



Sources: ElStat; Federation of Hellenic Information Technology and Communications Enterprises (SEPE); Digital Convergence; Greek Ministry of Finance; IMF report December 2011; EIU; PA e-procurement PoliMi report 2008; Gartner; Ovum; Global Betting and Gaming Consultancy (GBGC); Euromonitor; Eurostat; broker reports; interviews with industry experts; BCG analysis.

commercial opportunity both drive usage. More local content will have a viral effect, increasing both the measurable value of the Greek Internet economy and ROPO, thus benefitting both online and offline businesses. A number of Greek media and telecom companies are already moving to more Web-centric business models and putting more content online. We estimate that encouraging more local content could boost e-commerce by roughly an additional 8 percent, bringing it to approximately €1.2B in 2015.

Policymakers can also encourage multinationals like Amazon and eBay to establish a presence in Greece by cutting the red tape that inhibits foreign companies and start-ups alike from entering the market. They should also consider offering temporary tax exemptions for new online businesses. Policymakers can accelerate the disbursement of €1.5B of Internet-related subsidies (Digital Convergence) under the National Strategic Reference Framework (ESPA), assuring that the funds are used solely to grow companies' online business.

Infrastructure

Encouraging private investment in security, safety, and speed will be key in enabling greater business and consumer use of the Internet. Telecom companies should be given incentives (through lower broadband license fees, public-private infrastructure partnerships, and tax exemptions, for example) to spend on infrastructure upgrades. Other countries are already at it. In Australia, government has provided significant funding for the rollout of a national fiberoptic network. In Italy, Telecom Italia and the government of the Trentino have formed a joint venture to roll out fiberoptic cable in the province.

Broadband is an important area for improvement. Greater penetration—especially household penetration in remote areas—will not only enable more consumer Internet use, it will also give small businesses outside major cities national and international reach. Private companies have already undertaken a project to extend fiberoptic cable in both large municipalities and rural areas. Improved security and faster upload and download speeds will encourage Greek consumers to do more spending online and facilitate business-to-business e-commerce.

Consumption

Turning some ROPO into online consumption by improving consumer confidence in online purchases could add as much as €1.5B to the Greek Internet economy by 2015. Consumers are skeptical about Internet security. Improved infrastructure will help to allay some of these concerns. So would serious and well-publicized efforts by law enforcement to crack down on online fraud. Additionally, many Greek consumers are not well informed about how to protect their online privacy and safety. Public education and promotion on the subject would help users avoid online dangers and become more confident consumers.

Government

Moving as many state functions as possible online will benefit citizens, business, and the government itself, which will realize cost savings, increased efficiency, and more transparency. Citizens will experience savings in time and convenience. Small and medium-size businesses will also benefit and gain the comfort and confidence with the Internet that many of them currently lack. The move will help them bring their own operations online. This approach is being used in other countries. Turkey has passed legislation requiring all businesses to establish websites.

Steps toward greater e-government (which can be funded with the approximately €1.5B in ESPA funds for Digital Convergence) include the following:

- *Introducing compulsory online completion of government forms.* Examples are birth certificates, car registration, passport applications, military enrollment tax forms, and tax returns.

- *Requiring companies with government contracts to conduct all procurement (bidding, invoicing, and so forth) online.* In addition to being more efficient than paper, this creates a digital trail that can be used to reduce tax evasion.

ASSUMPTIONS OF FUTURE GROWTH

We estimate the Greek Internet economy will grow on its own to €3.6B, or 1.6 percent of Greek GDP, by 2015. This estimate is based on the following assumptions:

- **Consumption:** Consumption is expected to grow at a compound annual growth rate of 6 percent, driven mainly by an increase in Internet penetration. E-commerce is expected to grow by 9 percent annually, largely driven by the upcoming legalization of online gambling. Access spending is expected to increase by 3 percent annually and hardware spending by 7 percent annually.
- **Investment:** Private investment in the Internet is expected to grow by 0.6 percent annually.
- **Government spending:** State spending directly on the Internet is expected to grow at 0.5 percent annually.
- **Net imports:** Imports are expected to be offset somewhat by export growth of 1.5 percent annually. Net imports are expected to decrease by 1.6 percent annually. This will be driven largely by the legalization of online gambling (which is expected to shift approximately €150M of imports to domestic consumption from 2012 onward) as well as by an expected increase in exported goods and services.

- *Leveraging Greece's high mobile and smartphone penetration to accelerate citizen-state interaction.* This is being tried in India, where plans have been announced for all government department and agencies to develop and use mobile applications for public services.

Education

Increasing IT literacy for adults and connecting more schools to the Internet will help develop savvy online consumers and businesses. Adults can be reached through advertising and informational campaigns. For students, the key steps are connecting all schools to the Internet, moving educational materials online, and using software tools to create interactive classes. South Korea, for example, is currently investing heavily in the digitization of textbooks.

The Internet will not solve all of Greece's difficulties. It is, however, a powerful tool for business development, economic growth, and job creation (particularly youth employment). Numerous Greek companies, including those profiled in this report, have used the Internet not only to survive but also to grow during a time of great financial difficulty. Broadening the Internet's reach and deepening its use can create opportunities for a wide range of Greek companies to do the same.

APPENDIX

METHODOLOGY

The assumptions and analyses that form the basis for this report are outlined below.

GDP. The expenditure method of calculating GDP measures total spending on finished goods and services. Assumptions outlined in the main report are not reprised here.

Consumption. Online consumer spending includes spending on most goods and services. Spending on access includes consumer fixed and mobile Internet-service-provider charges, while hardware expenditure includes a proportion of spending on interface devices, such as computers or mobile phones, and infrastructure devices, such as wireless routers.

Estimates are calculated using research reports and data from Euromonitor, Gartner, the Hellenic Statistical Authority (ElStat), the Hellenic Association of Insurance Companies, the Organization for Economic Co-operation and Development (OECD), the Economist Intelligence Unit (EIU), IE Market Research (EIMR), International Data Corporation (IDC), and Ovum / Datamonitor.

Investment. We included the total value of fixed and mobile telecom investments, on the theory that they are all needed to maintain and facilitate broadband services. We included a portion of private investments in hardware and software spending by looking at the proportion of corporate-owned computers with a broadband connection and employees using broadband. Finally, we included all private investments in telecom equipment. Estimates are based on research by Gartner, the Observatory for Digital Greece, and Business Monitor International.

Government Spending. We estimated public spending on information and communications technology (ICT), including hardware, software, telecommunications, and support services, on the basis of research by Gartner, Ovum, interviews with industry experts, and internal estimates.

Net Exports. We estimated net exports of e-commerce and ICT equipment on the basis of data from the European Commission, You-Gov, and the OECD.

GDP Growth. We estimated growth in consumption by projecting online consumer spending and spending on access and hardware. The aforementioned estimates are based on projections of Internet penetration (percentage of Internet users over total population) and Greek GDP.

Estimates of growth in investment, government spending, and net imports are based on projections of Internet penetration, the growth of Greek GDP, and forecasts by the sources used to build the baseline estimate.

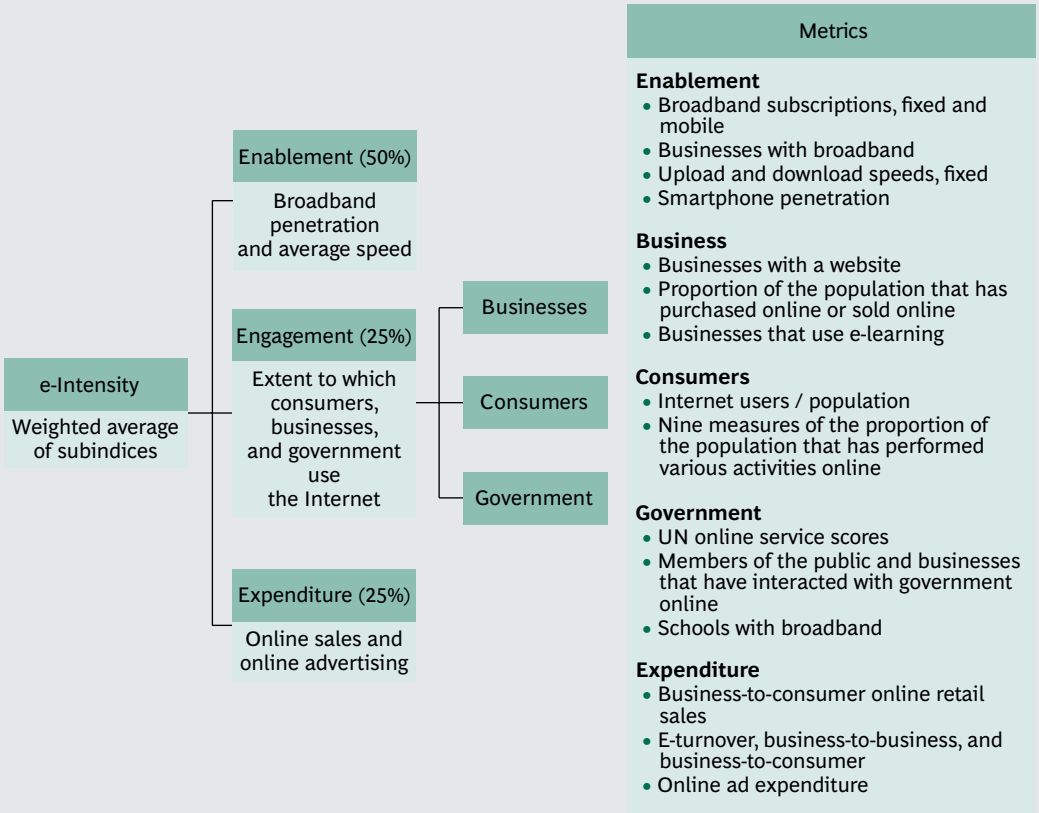
e-Intensity. The overall international and regional indices are formed as a weighted mean of three subindices: enablement, engagement, and expenditure. The engagement subindex is formed as an equally weighted mean of three further subindices: businesses, consumers, and government. All of the subindices are then formed as weighted means of several underlying metrics. (See the exhibit below.)

10 percent higher than the average value.

We also tested how sensitive the country rankings were to changes in the weights and choice of metrics by carrying out a Monte Carlo simulation using random weights and variables. The interquartile ranges were very small when a metric was randomly omitted.

The index is somewhat sensitive to different

Exhibit | The structure of the e-Intensity Index



Source: BCG analysis.
Note: Percentages in parentheses indicate the weight given to each subindex.

Data are not available for every metric and country for the international index. We input the missing data through regression, using strongly correlated metrics. We transformed the data so the indices and subindices would measure proportional differences in it.

To ensure intuitive interpretation, we transformed the indices and subindices and scaled them so that a reference value—the geometric mean of each index for all countries—was set to 100. As a result, if country A is awarded 110, then the metrics for country A are, on average,

weightings. In each iteration of the Monte Carlo simulation, the weight of each of the metrics and subindices was randomly modified. The interquartile range for each country was small, but there were groups of countries with similar mean scores and overlapping interquartile ranges. For example, the analysis shows that the rankings for the Netherlands, the U.K., Norway, and Finland cannot be easily distinguished.

NOTE TO THE READER

Acknowledgements

This work would not have been possible without the support of many people who contributed their time, knowledge, and access to data to the BCG team. We have relied extensively on many industry experts and business executives in Greece. They have been open in sharing their reflections on the impact of the Internet and providing valuable feedback on the analysis and conclusions in this report. It has been exciting to see the topic has stimulated high levels of interest and engagement across such a wide spectrum of professions and backgrounds.

The authors are especially grateful to their colleagues David Dean, Paul Zwillenberg, Dimitris Androulakis, Christos Dimas, and Aliki Merika for their invaluable contributions to this report. BCG is also grateful for the support of Katherine Andrews, Gary Callahan, Peter Carbonara, David Duffy, Kim Friedman, and Sara Strassenreiter in the preparation of this report.

For Further Contact

This report is also available in Greek.

If you would like to discuss our analysis or findings, please contact:

Vassilis Antoniades
BCG Athens
antoniades.vassilis@bcg.com

For information or permission to reprint, please contact BCG at:
E-mail: bcg-info@bcg.com
Fax: +1 617 850 3901, attention BCG/Permissions
Mail: BCG/Permissions
The Boston Consulting Group, Inc.
One Beacon Street
Boston, MA 02108
USA

To find the latest BCG content and register to receive e-alerts on this topic or others, please visit bcgperspectives.com.

Follow bcg.perspectives on Facebook and Twitter.

3/12

BCG

THE BOSTON CONSULTING GROUP

Abu Dhabi
Amsterdam
Athens
Atlanta
Auckland
Bangkok
Barcelona
Beijing
Berlin
Boston
Brussels
Budapest
Buenos Aires
Canberra
Casablanca
Chennai
Chicago
Cologne
Copenhagen
Dallas
Detroit
Dubai
Düsseldorf
Frankfurt
Geneva
Hamburg
Helsinki
Hong Kong
Houston
Istanbul
Jakarta
Johannesburg
Kiev
Kuala Lumpur
Lisbon
London
Los Angeles
Madrid
Melbourne
Mexico City
Miami
Milan
Minneapolis
Monterrey
Moscow
Mumbai
Munich
Nagoya
New Delhi
New Jersey
New York
Oslo
Paris
Perth
Philadelphia
Prague
Rio de Janeiro
Rome
San Francisco
Santiago
São Paulo
Seoul
Shanghai
Singapore
Stockholm
Stuttgart
Sydney
Taipei
Tel Aviv
Tokyo
Toronto
Vienna
Warsaw
Washington
Zurich

bcg.com