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263 Report by Alexander S. Kritikos, Lars Handrich, and Anselm Mattes

The Greek private sector remains full of untapped potential

- Value added of Greek economy 38 percent lower than in 2008; little growth expected
- High-growth firms and research system are full of potential
- Investment conditions have improved very little

LEGAL AND EDITORIAL DETAILS



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AT A GLANCE

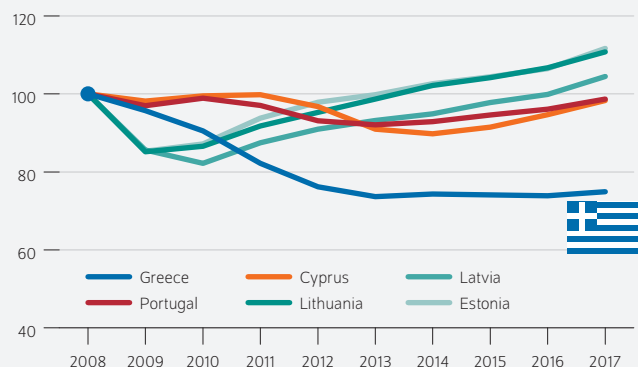
The Greek private sector remains full of untapped potential

By Alexander S. Kritikos, Lars Handrich, and Anselm Mattes

- 38 percent decline in the gross value added of the Greek business economy since 2008; strong growth not expected in the near future
- Micro firms, which employ over half of Greek workers, hit especially hard by the crisis
- Greece has high-growth firms in logistics and knowledge-intensive services; also the research system has potential
- Investment and innovation conditions have only improved selectively
- Pressure to reform dwindling as economic adjustment program ends: crisis not used as an opportunity

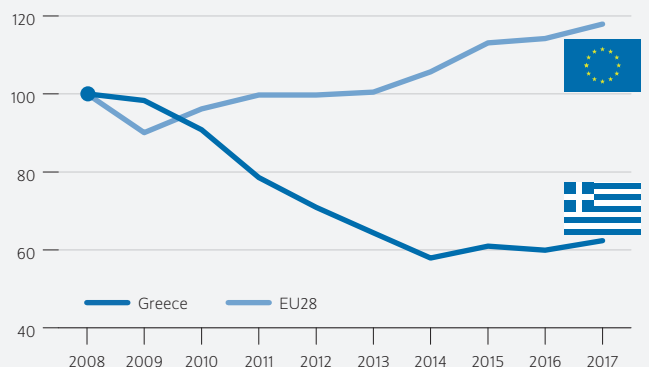
The value added of Greek private businesses is at 62 percent of the pre-crisis level in 2008—the potential of the Greek private sector remains untapped

Real gross domestic product in selected countries affected by the crisis 2008 to 2017, indexed 2008=100



Sources: Eurostat (2018); DIW Econ; based on Eurostat und ELSTAT data (2018).

Added value of private bussines in Greece and the EU average Factor costs, indexed 2008=100



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FROM THE AUTHORS

“The crisis was often described as an opportunity for a fresh start. When the third economic adjustment program for Greece ends, so will the pressure to reform. The Greek governments will then have missed the chance to make a transition towards an innovation-driven economy and to enter a sustainable economic growth path.”

— Alexander S. Kritikos, survey author —

MEDIATHEK



Audio Interview with Alexander S. Kritikos
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The Greek private sector remains full of untapped potential

By Alexander S. Kritikos, Lars Handrich, and Anselm Mattes

ABSTRACT

Private businesses' nominal value added in Greece has fallen by 38 percent over the last ten years. Micro firms were hit particularly hard. Despite efforts to stabilize the macroeconomic environment, there are only weak signs of recovery. Future prospects are not much better, as—with the exception of labor market regulations—the conditions for investments and business activities have not been sufficiently changed through eight years of reform process. Fundamental issues—excessive red tape, bulky administrative procedures, slow courts, complicated taxes, and an inefficient knowledge transfer—remain unaddressed. Greece cannot achieve its urgently needed strong and sustainable economic growth without these reforms. When the third economic adjustment program for Greece ends in August, so will external reform pressure. It remains an open question whether the government—current or future—will feel compelled to complete and implement the pending reforms.

Since 2008, when the financial crisis hit Greece, the country has suffered from an unprecedented negative economic development. Following a six-year economic decline in GDP of almost 30 percent, stagnation over the next four years followed with no significant economic recovery. No other European country experienced such a decline over this time period (Figure 1). The Greek economy remains far from its pre-crisis level. In 2018, the unemployment rate still exceeds 20 percent, even though labor market conditions have somewhat improved compared to 2013, when more than every fourth working person was registered as unemployed. At the same time, public debt remains alarmingly high at 325 billion euros, around 180 percent of the current GDP.

Despite these negative economic indicators, the Greek government recently declared the end of the sovereign debt crisis. After having gone through three economic adjustment programs, it aims to restore “national sovereignty” and to once again issue government bonds instead of applying for a precautionary credit line from the European Stability Mechanism (ESM). This request was supported by the Eurogroup of Euro-zone finance ministers who, by creating a liquidity buffer and extending the repayment period for a large part of the Greek public debt by ten more years, have given the country considerable scope in which the Greek state will not depend on raising capital via the markets.¹

Ten years of crisis management: an assessment

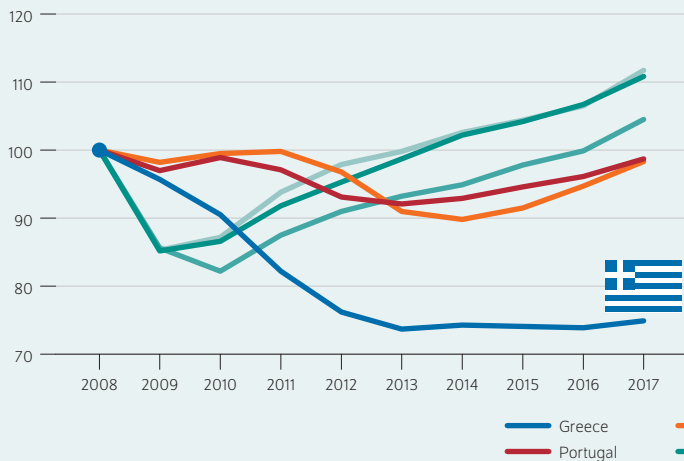
Under the three economic adjustment programs, the various Greek governments have reached agreements with Greek creditors on new crisis management measures. Countless reforms have mainly served to successfully consolidate the primary surplus. At the same time, these reforms led to a massive decline in domestic demand due to lower wages, salaries, pensions, and social benefits and other government expenditure; substantial tax increases; and a reduction in the number of civil servants. However, in the wake of the crisis, there was also a lot of discussion whether it was also an opportunity for a new era of economic policy and structural

¹ It is not yet possible to know to what extent Greece's public debt has become sustainable; however, this is not the focus of this study.

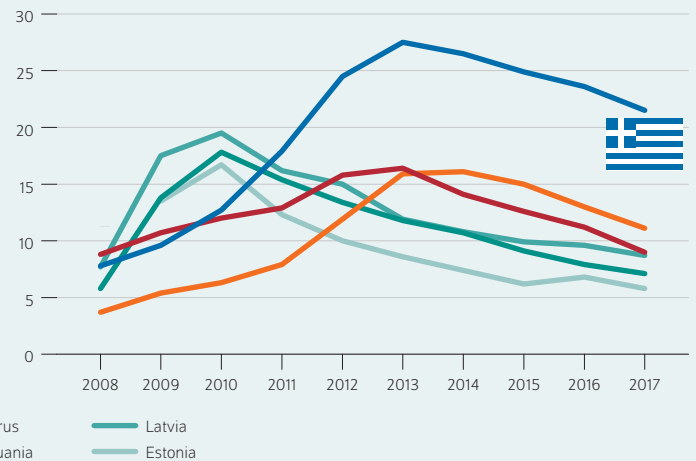
Figure 1

Greece compared to selected countries affected by the crisis

Real gross domestic product, 2008 to 2017
Indexed (2008=100)



Unemployment rate
In percent of workforce



Source: Eurostat (2018).

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Greece has seen a substantial economic decline in the last ten years.

change. With the end of the economic adjustment programs, it is now time to assess how Greece's private economy has developed in light of the economic crisis and reforms. This report provides an overview of the composition of the supply side of the Greek economy, its changes over the past ten years, and the potential for future economic development.

As a member of the euro area, Greece must better capitalize on its membership and move towards an innovation-driven economy in order to achieve sustainable growth, in line with the concept of "smart, inclusive, and sustainable growth" set out in the European growth agenda.² Such a transformation process would enable the country to make better use of its existing potential in research and development, well-educated specialists and managers, and innovative entrepreneurs. Therefore, this report also examines to what extent the countless reforms have affected the quality of the public institutions in Greece and to what extent they have contributed to the further development towards an innovation-driven economy.

The economic crisis in Greece was first and foremost a structural crisis

Before the crisis, the majority of players in the Greek economy were small firms, meaning that there were not many larger, productive companies serving international markets. Even in

the manufacturing sector, the majority of employees worked in micro firms with less than 10 employees, unable to take advantage of increasing returns to scale.³ Economic activity was concentrated on tourism, trade, and the food industry—sectors with a low innovation intensity and low value added. Both factors, fragmentation and low innovation intensity, led to a particularly low export rate of around 25 percent of GDP.⁴ This was partly due to the fact that only 18 percent of all exports consisted of high value added products.⁵

The poor economic situation was also owed to red tape, opaque and complex regulations, and badly functioning public institutions.⁶ Day-to-day operations were characterized by onerous reporting obligations and bureaucratic hurdles.⁷ Different internationally recognized indicators for recording this regulatory environment rank Greece at the bottom when compared to other countries in the euro area,⁸ discouraging innovators, entrepreneurs, and investors to stay in Greece.

³ See Alexander S. Kritikos, "Greece Needs a Strategy for Its Transition to an Innovation Economy," *DIW Economic Bulletin*, no. 10 (2014): 3–10 (available online).

⁴ See Karl Brenke, "The Greek Economy Needs a Growth Strategy," *DIW Economic Bulletin*, no. 3 (2012): 3–15 (available online).

⁵ See European Commission, *European Innovation Scoreboard 2015* (2016).

⁶ Benedikt Herrmann and Alexander S. Kritikos, "Growing out of the Crisis: Hidden Assets to Greece's Transition to an Innovation Economy," *IZA Journal of European Labor Studies*, 2:14 (2013).

⁷ For example, the World Bank's Ease of Doing Business Index showed that the labor markets in Greece were completely over-regulated, the process of founding a company was incredibly arduous, investor protection was weak, and investors had to wait far too long to enforce contractual claims in court; see World Bank, *Ease of Doing Business Full Report* (Washington: 2008).

⁸ See also OECD, "From European Economy," *Occasional Papers*, no. 68 (August 2010).

² This is part of the Agenda EUROPE 2020—A strategy for smart, sustainable, and inclusive growth. European Commission, *Europe 2020 strategy* (available online), accessed on July 5, 2018. This applies to all other online sources in this report unless stated otherwise.

Box 1

Data basis

Data used to analyze the Greek economic structure

The data used to analyze the Greek economic structure consists of a dataset compiled by DIW Econ on behalf of the European Commission (DG Grow) as part of the annual SME Performance Review based on Eurostat Structural Business Statistics data. In addition, data from the Hellenic Statistical Authority (ELSTAT) as well as estimates based on current data from Eurostat's national accounts were used.¹ These datasets have improved significantly over the past few years as ELSTAT previously did not provide much data on the economic structure.

The non-financial business economy investigated in this report includes sections B-J as well as L-N of the NACE Rev. 2 classification of economic activities and thus represents the main parts of the private sector, with the exception of the financial and agriculture sectors. Not included are predominately state or state-regulated areas such as health and social services, education, culture, and defense.²

The data used to calculate gross value added—the Structural Business Statistics—is different from the national accounts data usually used to calculate GDP. This results in various discrepancies: first, the values used here refer exclusively to the non-financial business economy and, unlike the GDP, not the overall economy. The difference between gross value added and GDP lies in the balance of taxes on products and product subsidies. Furthermore, the Structural Business Statistics and national accounts data are based on partly different sources. Both data sets have different objectives: while the Structural Business Statistics has the goal of depicting individual sectors and firm size classes in detail, the national accounts primarily aim to depict the economy as a whole while also maintaining consistency between the various industries

(for example, the sum of gross value added of all economic sectors must equal the total gross value added). National accounts also take into account economic activities carried out not by enterprises but by private individuals or in the informal economy. In addition, various price concepts are used: Structural Business Statistics show the nominal value added at factor costs, while GDP is shown at market prices.

Data used to analyze business conditions

The data used to analyze the conditions for founding and growing a business are partly taken from the indicators used in the World Bank's Ease of Doing Business index,³ which assess the business conditions (such as legal certainty, tax system, bureaucracy, etc.) in most countries in the world. Information from the European Commission's European Innovation Scoreboard was also used.⁴ The scoreboard uses a large number of individual indicators to assess the innovation conditions in the countries of the European Union. Both indicators are—like other similar indicators—regularly subjected to methodological criticism because the selection and exact definition of specific individual indicators as well as their weighting often cannot be made clearly and objectively. To reduce uncertainty associated with the use of such indicators, we have not drawn conclusions from changes in individual detailed indicators in the context of this study, but rather analyzed the overall picture that results from viewing many different individual indicators. Furthermore, alternative indicators such as the Global Innovation Index⁵ or the World Economic Forum's World Competitiveness Index⁶ point to similar results.

Despite the criticism of certain aspects, the indicators are widespread and important in evaluating policy measures.

¹ A detailed explanation of the data and methods used can be found on the SME Performance Review page on the website of the European Commission (available online).

² Eurostat, *NACE Rev. 2: Statistical classification of economic activities in the European Community* (2008) (available online).

³ World Bank, *Ease of Doing Business Index* (2018) (available online).

⁴ European Commission, *European Innovation Scoreboard* (2017) (available online).

⁵ Cornell INSEAD WIPO, *Global Innovation Index* (2017) (available online).

⁶ World Economic Forum, *Global Competitiveness Report* (2018) (available online).

Greece also lagged behind in terms of supporting the development of innovative products and services with high value added. While other euro area countries were already investing around 2.5 percent of their GDP or more in research and development in 2008, it was only 0.7 percent in Greece.⁹

To this day, the Greek crisis is often seen primarily as a sovereign debt crisis that resulted from macroeconomic imbalances in the euro area and failed national fiscal policies starting in 2008. However, the unfavorable structural conditions in Greece were having a negative impact even before the crisis began. Migration flows out of Greece are an indicator of the early onset of the structural crisis. While highly-qualified

Greek workers began emigrating in 2010, inventors had already begun leaving Greece in 2003.¹⁰ At a time when all signs were still pointing to economic growth in Greece, the country was exporting its talents instead of the technological products it could have produced with the help of these talented people.

As a result, a structural crisis latently existed much earlier in Greece, concealed by an expansive fiscal policy. It only became visible over the course of the financial and economic crisis. Thus, in 2008, the country had both a public debt and competitiveness problem.

⁹ See OECD, *Main Science and Technology Indicators* (2018).

¹⁰ See Kyriakos Drivas et al, "Mobility of Highly-Skilled Individuals and Local Innovation and Entrepreneurship Activity," Paper presented at the FIRES Conference, Athens, Greece, October 7, 2017.

After ten years and many reforms, the crisis disproportionately affects Greece's industrial economy

While the nominal gross value added of the non-financial business economy (Box 1) in the EU had almost reached the nominal pre-crisis level by 2011 after a brief crash in 2008/2009 and has continued to rise since 2014, a continuous decline in value added began in Greece in 2009/2010 and lasted until 2014. A short recovery phase was followed by another slump in 2015/2016 and slight growth was first again recorded in 2017. In comparison to 2008, the nominal value added of the business economy in Greece has fallen by almost 38 percent in 2017; at the lowest point of the development in 2014, it was at about 42 percent (Figure 2).

The economy is still highly fragmented

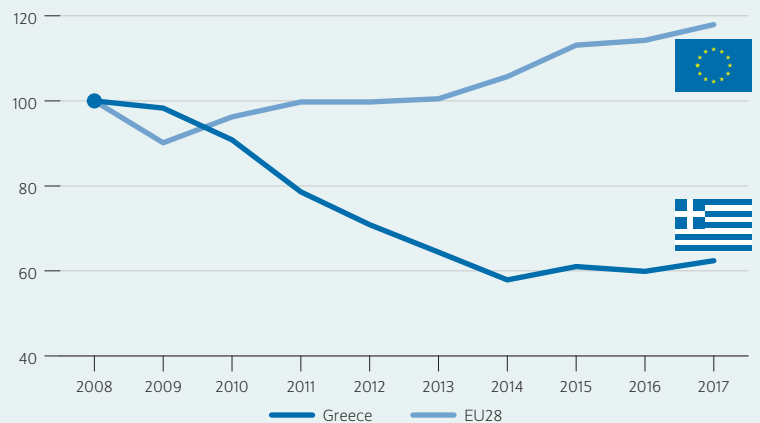
Small and medium-sized enterprises (SME) play a particularly important role in Greece's economic development. They form the potential core source of economic growth as there are relatively few large companies. A breakdown by company size illustrates that the sharp decline in the business economy's gross value added affected micro firms (fewer than ten employees) the most but also impacted small businesses (ten to 49 employees). By 2017, the nominal gross value added had fallen to around 40 percent of the pre-crisis level in the case of micro firms and around 55 percent for small businesses. Value added of medium-sized and large firms also experienced a sharp decline, but by 2017 was back at around 80 percent of the nominal value in 2008. Therefore, the distribution of value added according to company size has shifted in favor of large firms: their share of gross value added rose from 29 percent to 36 percent between 2008 and 2017 (Figure 3). Compared to the EU, the share of value added by large firms with more than 250 employees in Greece is still below average, but levels tend to converge when compared to other Southern European countries.

The transportation and logistics sector recorded relatively small losses compared to the overall economy, with a decline in value added of nine percent between 2008 and 2017 and now has positive growth forecasts. The hospitality industry (accommodation and food services) recorded relatively a small decline in value added of 16 percent, and has, thanks to tourism, positive growth forecasts, as well as. Similarly, water transportation and harbors have positively developed within the logistics sector. Relatively successful sectors were and are primarily programming and information services (+1 and +44 percent) as well as the food (+/- 0) and pharmaceutical industries (+9 percent). The retail and wholesale sectors, on the other hand, were strongly affected by the crisis (-60 percent), as was the construction industry, which lost 30 percent of its (nominal) value added as well as 50 percent of its workers.¹¹

¹¹ The values for the construction industry reflect the development from 2009 to 2017. There are no reliable values for 2008. Therefore, the decline in value added in the construction industry may actually be much higher (see Dimitris Christelis, "Vermögenssteuer auf Immobilien: Gefahr der Vernachlässigung

Figure 2

Value added in the private sector In factor costs, indexed (2008 = 100)



Sources: DIW Econ; Author's own calculations based on data provided by Eurostat und ELSTAT (2018).

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At its lowest, value added in Greece's private sector fell to 42 percent below 2008's pre crisis-level.

Box 2

Definition of high-tech industries

The definition of high-tech industries is based on the European Commission's SME Performance Review definition. Based on NACE Rev. 2, a statistical classification of economic activities, the pharmaceutical and computer, electronic, and optical products industries are research-intensive. Knowledge-intensive business services include aviation and shipping; information and communications; professional scientific and technical services; labor recruitment and provision of personnel, and security and detective services.

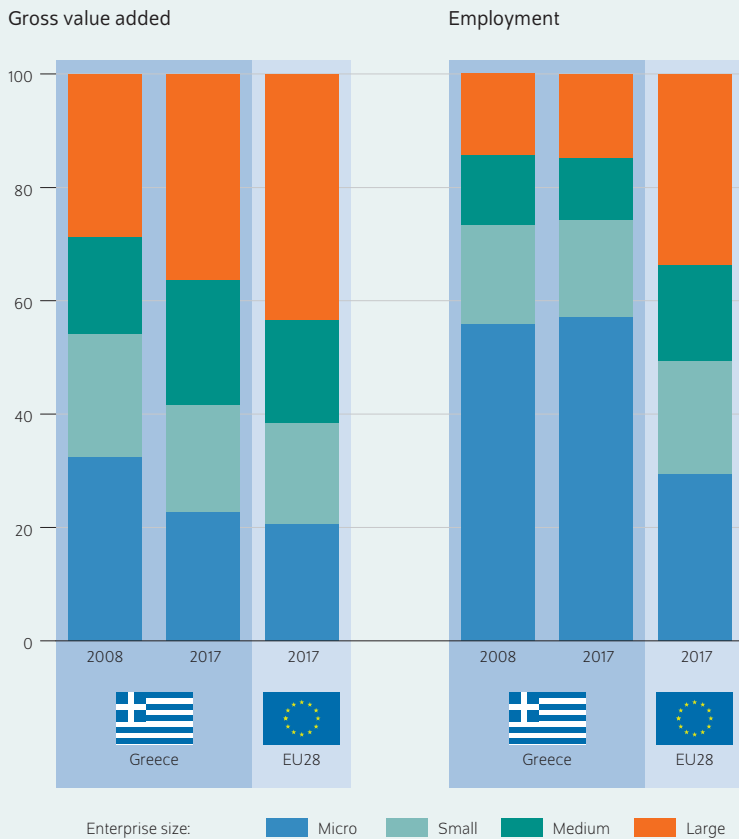
The Greek economy has barely become more innovative

The business economy in Greece is below average in terms of knowledge intensity and technology (Box 2). The share of value added of research-intensive industries and knowledge-intensive business services (KIBS) was at 33 percent for the EU in 2017. This share is smaller in Greece, even though it recently rose from 23 percent before the crisis to 27 percent. However, this relative increase can primarily be attributed to the stronger decline of less knowledge- and technology-intensive sectors. The high-tech sectors in the manufacturing industries, which play a minor role in the Greek

von Marktsignalen," in *Die griechische Wirtschaftskrise: Drei Reformpakete und kein Ende in Sicht, Vierteljahresshefte zur Wirtschaftsforschung* 4, eds. Alexander S. Kritikos and Christian Dreger (2015), 81–104 (in German; available online).

Figure 3

Greece's economic structure by size of firms In percent



Sources: DIW Econ; Author's own calculations based on data provided by Eurostat und ELSTAT (2018).

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While the share of large firms in Greece regarding value added approaches the European average, their share of employment remains low.

economy, and KIBS have survived the crisis better than the low-tech sectors, with the exception of the tourism industry (Figure 4 and Table 1).

Drastic decline in employment

The massive collapse of value added in the business economy had negative effects on employment, which fell steadily in the private sector starting in 2009 and stagnated at a low level until a turnaround began in 2016. It should be emphasized that until 2014 primarily employees in medium-sized firms were affected by layoffs, as employment fell by up to 30 percent, and employees in micro firms less so. This is also evident when looking at different economic sectors: while the number of employees, above all in the SME-oriented KIBS, has remained relatively constant, significant job losses were recorded in all other sectors. In 2015, as the private sector once again crashed during the "Grexit crisis" when the new government under Prime Minister Alexis Tsipras took over government affairs and employment in the business

economy declined by a further ten percent, a large proportion of employment losses were at the expense of employees in micro firms, especially in KIBS.¹²

High-growth firms in Greece

The fact that despite the crisis some Greek firms can be classified as high-growth firms is one of the few positive developments.¹³ While only six percent of businesses in Greece can be classified as fast growing—below the average of almost ten percent in the EU—the share of employees in these fast-growing companies is almost as high as the EU average (14 percent) at 13 percent of all employees. Many high-growth firms are in the transportation and logistics sector as well as in the professional, scientific, and technical activities sector (Figure 5).

Slight improvements to the economic structure

Only little progress can be seen in Greece's economic structure. Large firms generate a slightly higher share of value added than ten years ago, the share of technology- and knowledge-intensive sectors in the total economic output has risen slightly, and the share of fast-growing firms is only slightly under the European average. However, the higher shares of technology-intensive and knowledge-intensive firms have been triggered primarily by a massive contraction of small and micro firms as well as less innovative firms overall. Very few sectors actually experienced real growth. In 2017, the manufacturing industry, which plays only a minor role in the overall economy, as well as the professional, scientific, and technical services were able to provide positive triggers for growth.

Comparing the current size structure of the Greek business economy with the EU average or other Southern European countries, the business economy in Greece remains highly fragmented. Still, only 15 percent of the workforce is employed in large firms with 250+ employees. Large firms in the manufacturing industry, which usually has larger corporate structures, employ only 18 percent of all workers; in the EU, the share is at 42 percent. The share of employees in micro firms, however, which tends to be less productive, remains at a high level of 57 percent (Figure 3).

Greece has not yet reached the turning point

With the end of the economic adjustment programs and the creation of primary surpluses in the state budget over the past two years, the Greek government is planning to send a signal

¹² Author's own calculations based on data by Eurostat and ELSTAT (2018). This seems to contradict the development of the unemployment rate, which has been declining since 2013. As both (employment in the business economy and the unemployment rate) have fallen, a certain share of the unemployed labor force must have either been moved out of unemployment statistics, or moved to other sectors of the labor market (public sector employees), or left Greece. However, the available data do not allow for a reconstruction of this development.

¹³ According to Eurostat's definition, high-growth firms are those that have experienced average employment growth of at least ten percent per year for the past three years and had at least ten employees in the first year. These companies play an especially large role in shaping economic structural change and create a disproportionately high number of new jobs.

to the markets and investors that the macroeconomic turbulence of the past ten years no longer represents an obstacle to growth. The EU and its member states support this signal as creditors of Greece by creating a liquidity buffer; however, they expect very high primary surpluses of 3.5 percent of GDP every year until 2023 and 2.2 percent until 2060 in return from Athens.¹⁴

Temporarily stabilizing the macroeconomic environment is—as Greece’s past up until 2008 shows—a necessary but not a sufficient condition for the growth of existing companies or the creation of innovative start-ups, thus for the development of a competitive economy. For investments to be profitable, innovative start-ups to remain in Greece, and companies to grow and to access international markets, a more positive business environment must be created. Such an environment includes basic aspects such as political stability; smoothly and efficiently functioning legal and public administrative systems; efficient regulation of product, labor, and capital markets; and a moderate tax level as well as a reliable and predictable tax system. These factors will be analyzed below using various indicators to assess how Greece’s regulatory environment has developed after a large number of reforms from the three economic adjustment programs (Box 1). The small, Southern European countries of Portugal and Cyprus were chosen as benchmark countries as they were both strongly affected by the economic and financial crisis of 2008. Furthermore, the Baltic republics were also chosen as comparative countries as they, as former Soviet Union states, had to undergo extensive structural change and were affected by the financial crisis before implementing an innovation-driven growth model.

Still a weak regulatory environment for innovative businesses

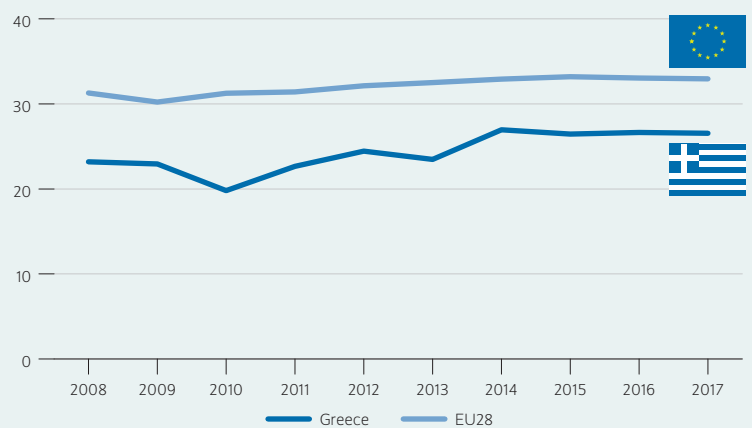
Political stability is a fundamental prerequisite for economic growth. However, the political conditions in Greece are in many ways unstable. For instance, cross-party consensus on fundamental issues hardly exists. Taking the development of an innovation system as an example, a consensus would mean that such a development is consistently continued following the concept of an “institutional memory”, even when ministers or governments change. In Greece, on the contrary, investments and projects started by previous governments are often stopped, reforms are overturned or even turned into opposite direction to their original goal. This assessment of the situation is supported by relevant World Bank indices which rate Greece as significantly worse in terms of “Political Stability and Absence of Violence/Terrorism” than the benchmark countries.¹⁵

Greece’s performance in the World Bank’s Ease of Doing Business Index is also rather weak. While Greece achieved select, positive changes between 2009 and 2014—for example, with regard to investor protection or starting a business—not

Figure 4

Share of research-intensive industries and knowledge-intensive services in the business economy

Share in percent of gross value added



Source: DIW econ; Author's own calculations based on data provided by Eurostat und ELSTAT (2018).

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The share of knowledge-intensive industries in Greece has risen although this is mostly due to a decline in other industries.

Table 1

Value added by technology-intensive industry and knowledge-intensive services in Greece

Gross value added in factor costs, in million euros

Manufacturing industries	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
High-technology	302	291	249	247	268	276	350	293	310	339
Medium-high-tech	1,604	1,621	1,584	1,298	1,179	1,100	995	957	993	1,101
Medium-low-tech	3,325	3,449	3,144	2,783	2,355	1,971	1,375	1,495	1,543	1,716
Low-tech	4,426	5,047	4,837	3,969	3,628	3,002	3,059	3,033	3,141	3,484
Total manufacturing	9,658	10,408	9,815	8,297	7,430	6,349	5,780	5,777	5,988	6,640

Services	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Knowledge-intensive services, of which	9,691	9,649	6,973	7,349	6,932	5,971	5,564	5,647	5,321	5,566
High-tech	1,686	1,744	1,310	933	1,212	1,255	1,226	1,202	1,134	1,114
Less knowledge-intensive	30,658	30,346	27,684	23,640	19,919	18,994	14,284	14,645	13,565	14,203
Total services	40,349	39,995	34,657	30,989	26,851	24,965	19,847	20,292	18,886	19,769

Sources: DIW Econ; Author's own calculations based on data provided by Eurostat und ELSTAT (2018).

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¹⁴ Therefore, in political discourse it is addressed as an implicit fourth economic adjustment program.

¹⁵ See World Bank, *Worldwide Governance Indicators Project* (2018) (available online).

Table 2

Regulatory environment for innovative businesses

Rankings in the World Bank's Ease of Doing Business Index

	Greece	Portugal	Cyprus	Lithuania	Latvia	Estonia
Overall ranking 2018 ¹	67	29	53	16	19	12
Overall ranking 2008 ²	100	37	–	26	22	17
Registering property 2018 ¹	145	28	92	3	22	6
Getting credit 2018 ¹	90	105	68	42	12	42
Paying taxes 2018 ¹	65	38	44	18	13	14
Enforcing contracts 2018 ¹	131	19	138	4	20	11
Days until first instance court decision in business cases 2008	819	577	–	210	279	425
Days until first instance court decision in business cases 2018	1,580	547	1,100	370	469	455

¹ Of 190 countries.² Of 178 countries.

Sources: World Bank: Doing Business (2008); Doing Business (2018).

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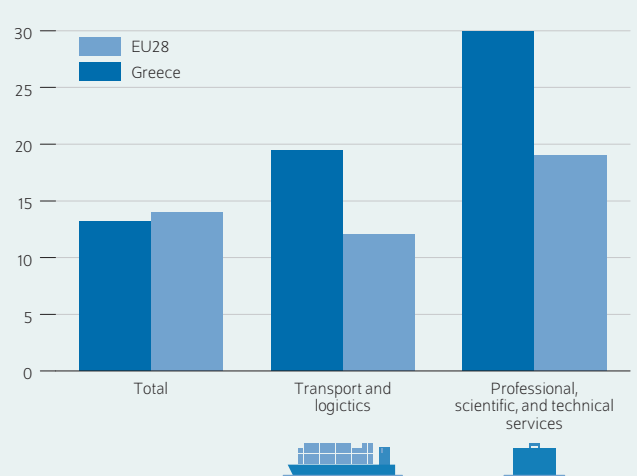
only the overall indicator but also many individual indicators in the Ease of Doing Business Index remain at the bottom of the ranking in the euro area or have even worsened their position since 2014. Today, Greece is ranked 67th while the other now-former crisis countries are continuing to perform better: Portugal is ranked 29th and the Baltic republics are in the global top 20.

Looking at the individual indicators reveals that Greece continues to show striking weaknesses, particularly with regard to the issues that are central for innovators and investors. For example, the country now has even greater problems in enforcing contracts and it takes far too long for claims to be enforceable in court. The Ease of Doing Business Index points to an increase in the time needed to reach first instance decisions in court disputes from a period of a little over two years in 2008 to almost 4.5 years in 2017. Anecdotal reports indicate that there can even be waiting periods of up to ten years until a final verdict is reached. The process in all benchmark economies is significantly faster. Many other issues, in particular red tape, still hampers day-to-day operations in the face of countless and often contradictory administrative regulations.

In addition, banks face an emergency situation: they have a disproportionately high share of non-performing loans in their books. In March 2016, it was 47 percent of all loans granted. After various measures, this share has been reduced to 43 percent at the beginning of 2018. Still, this has a very negative effect on the economy, as new loans are rarely granted to businesses. The tax system has also remained unreliable. The tax regime, tax rate, and tax bases are continually changing, thus making it difficult for companies to plan (Table 2). Moreover, following recent increases in value-added tax, corporate, income, and wealth taxes as well as social security contributions, the tax burden in Greece is so discouraging that small businesses have begun moving to neighboring countries.¹⁶

¹⁶ See also "An actual Grexit," *The Economist*, February 18, 2016 (available online).

Figure 5

Share of employees in high-growth firms
In percent, 2015

Source: DIW Econ; Author's own calculations based on data provided by Eurostat and ELSTAT (2018).

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The share of employees in high-growth firms is high in some sectors and offers potential for future growth.

A significant exception is the regulation of the Greek labor market. While this was considered one of the most closely regulated markets before the crisis, considerable steps have been taken to increase the flexibility of the labor factor and a massive reform process has been enforced. Compared to other countries, the Greek labor market is now considered one of the least regulated in Europe.¹⁷ However, it is feared that the disadvantages of the labor market reforms will outweigh the advantages for the employees as long as the lack of other reforms inhibits the venturing of new firms with growth potential. These labor market reforms will only yield a positive effect in terms of new job creation if the regulatory environment for start-ups and firms is finally improved.

In this context, it must also be noted that Greece lacks a modern social security system that meets European standards and includes welfare and unemployment assistance for those who have been unemployed for a longer time.

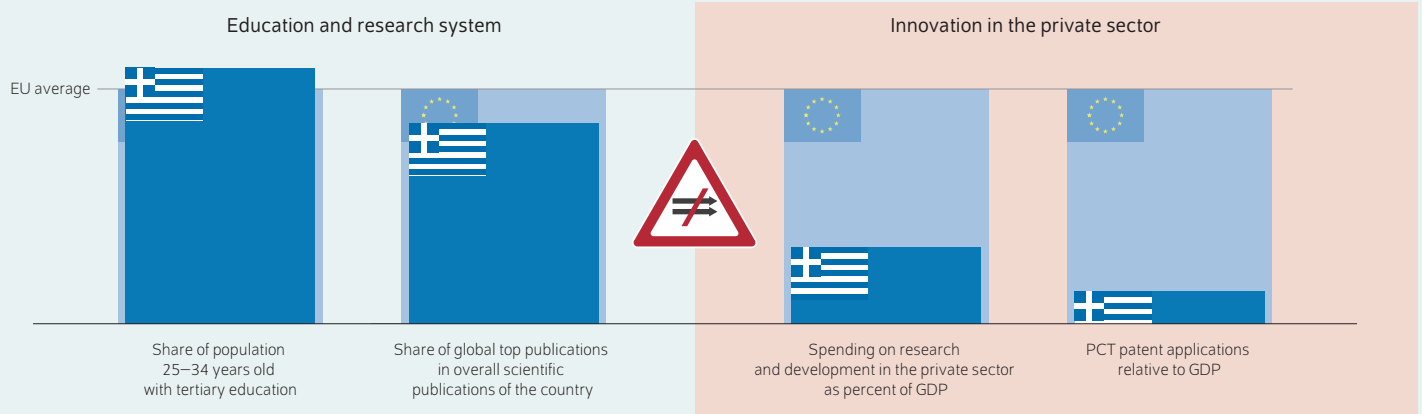
Lack of cooperation between the scientific and business communities is hampering innovation

An important question for the future of the Greek economy is to what extent innovative businesses are supported. Support is especially effective when the country has a functioning

¹⁷ This is reflected, for example, in an extreme change in the Global Competitive Index published by the World Economic Forum, which sank from 12.6 in 2008 to 1.2 in 2017. See Vasiliki Bozani and Nick Drydakos, "Die griechische Wirtschaftskrise, Arbeitsmärkte und Politikmaßnahmen," in *Die griechische Wirtschaftskrise: Drei Reformpakete und kein Ende in Sicht, Vierteljahresshefte zur Wirtschaftsforschung* 4, eds. Alexander S. Kritikos and Christian Dreger (2015), 129–144 (in German; available online).

Figure 6

Exemplary indicators for the strengths in the education and research system as well as the weaknesses in transferring the knowledge to the business sector



Source: European Commission: European Innovation Scoreboard (2018), most current available data

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The Greek education and research system does not have to hide itself in Europe—but without reform the knowledge will not find its way into the private sector.

innovation system.¹⁸ This requires a strong education system, research-oriented universities, and a regulatory and legal environment that supports the transfer of knowledge between research institutions and companies.

In this context, it should be emphasized that a wide-reaching political consensus that R&D investments should be supported by all stakeholders, regardless of which government is currently in power, is of the utmost importance as the positive effects of such investments only unfold in the longer term and must not be discarded by every new administration. Only under such a consensus is an economy able to become more competitive due to new technologies and not only due to low labor costs. Greece has a score of 69 percent of the EU average on the European Innovation Scoreboard 2018, a composite index that assesses the quality of a national innovation system using a large number of different individual indicators. Greece was ranked above Bulgaria and Romania but with regard to its innovative capability, the country is worse off than most Middle and Northern European countries. There was no change in the score compared to 2010. Many benchmark economies are performing above the EU average, such as Portugal, Estonia, and Cyprus (Table 3).

If the Global Innovation Index is used instead, all benchmark economies have better rankings as well. This index has identified that the education system and the output of the science system (measured by the number of published articles in relation to GDP) are Greece's strengths. Weaknesses in the Greek innovation system were noticed in the exchange of knowledge between the research and business worlds (Figure 6).

Table 3

Indicators for the cooperation of science and business

	Greece	Portugal	Cyprus	Lithuania	Latvia	Estonia	EU28
European Innovation Scoreboard Overall ranking relative to EU28 (2018)	65	80	77	71	57	79	100
Global Innovation Index overall ranking (2017)	44	31	30	40	33	25	
Share of global top publications in overall scientific publications of the country (2015)	9.0	9.0	9.0	4.3	6.2	8.2	10.6
Public-private co-publications per million population (2017)	10.5	13.2	21.1	3.9	1.0	10.6	40.9
Spending on research and development in the private sector as percent of GDP (2016)	0.4	0.6	0.2	0.3	0.1	0.7	1.3
PCT patent applications per billion GDP (2015)	0.5	1.0	0.8	0.8	0.8	1.0	3.5

Source: European Innovation Scoreboard (2018); Global Innovation Index (2017).

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¹⁸ See Richard R. Nelson, *National Innovation Systems: A Comparative Analysis* (Oxford: Oxford University Press, 1993).

Four exemplary indicators can be used to illustrate the strengths in the education and science systems and the weaknesses in transferring this knowledge to the economy and translating it into innovation:

1. In terms of its share of high-quality publications, Greece is just under the EU average and almost on the same level as Portugal, ahead of all other benchmark countries.
2. Greece is significantly behind the EU average and Cyprus in the share of public-private co-publications but on a similar level as Portugal and Estonia and very much ahead of Lithuania and Latvia.
3. In Greece, the expenditure for research and development (R&D) in the business sector in relation to GDP is significantly below the EU average at only 0.43 percent of GDP. In the group of benchmark countries, however, Greece ranks in the middle.
4. A comparison of patent registrations per euro of economic output shows that Greece is lagging behind extremely in converting R&D into marketable patents.

Overall, it should be noted that Greece's innovation system remains fragmented. In particular, the knowledge transfer between the research systems and innovative start-ups or established firms is strongly inhibited.

Conclusion

Greece has experienced three economic adjustment programs over the past decade. While each sought to improve the state of its public finances, the nominal gross value added of the business economy has fallen by 38 percent. The multi-year reform process was linked to the expectation that the reforms would positively impact not just the national budget but also Greece's future economic development. However, as the Greek finance minister concedes,¹⁹ many of the conditions that discourage investment survived the reform process unscathed, including excessive red tape, burdensome product regulation, inefficient public administration, unpredictable taxation, and slow court proceedings. Greece's

innovation system remains ineffective. Consequently, the recovery is, at best, weak. Any hope of achieving pre-crisis levels remains a long way off.

Unfortunately, the government does not embrace the reforms needed reforms. Instead of selecting reforms that concentrate mainly on deregulating the labor markets, the government must instead focus on the whole package of reforms, strategically designed for the future, with the explicit goal of creating an attractive investment environment in Greece. Models are easy to find: the Baltic republics have shown that it is possible to carry out radical administrative reforms quickly that positively impact long-term economic processes.

Strengthening the private economy requires cutting red tape, implementing efficient administrative procedures, speeding up court proceedings, and developing a reliable, effective, tax system with moderate tax rates. At the same time, banks must address their non-performing loans. However, the social component must not be forgotten. As the labor market has been deregulated, a social safety net that meets European standards must be implemented.

Economic potential is not lacking: not only could Greece strengthen its tourism industry, but it could strengthen its transportation and logistics industry, its knowledge-intensive services, and, to a lesser extent, its manufacturing industry as well. To support innovative companies, it must strengthen cooperation between science and business, as both worlds still remain distinctly separate in modern Greece. The Greek government must offer private businesses more incentives for R&D investments and, at the same time, increase government spending on R&D in a targeted manner. To take advantage of increasing returns to scale, Greece must also seek to grow its number of large firms.

For Greece as a whole, implementing supply-side oriented reforms with the goal of increasing private investments is the most important plan for the future in order to achieve a path towards sustainable growth. Initially, Greece can and should aim for growth rates of five percent, as this poses a realistic scenario considering the very low GDP and the Greek economy's potential.

¹⁹ Tobias Piller, "Tsakalotos: 'Es wird keine neue Kreditlinie geben,'" *Frankfurter Allgemeine Zeitung*, May 15, 2018 (in German; available online).

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