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Georg Quaas

Problem Child Greece

In summer 2018, Greece left the EU rescue umbrella. Enormous efforts were made by the Greek state and its population to cut back its over-consumption and recurring new debt. The austerity measures were associated with numerous reforms aimed at advancing the Greek economy. Doubts that sustainable success was achieved are more than justified. The positive development of net exports, for example, was mainly at the expense of investment. This led to an enormous and uneven reduction of capital stock. With one exception, the structure of investments in capital stock is not optimal and should be readjusted according to the current available data.

In the summer of 2018, the European Union, together with Greece, celebrated the end of the 2015-2018 European Stability Mechanism (ESM) reform programme, based on a normalisation of government consumption and a reduction in social benefits. Figure 1 shows the course of the enormous efforts made by the Greek state and its population to cut back its recurring new debt.

The austerity measures were and are associated with numerous reforms aimed at advancing the Greek economy. In its 31 July 2018 report, the International Monetary Fund (IMF) acknowledged that the economy had stabilised and was growing again. However, it also concluded that the legacy of the crisis and the unfinished reforms continue to weigh on the outlook. In the report, a list of unresolved problems follows, including high tax rates levied on a narrow economic basis and high unemployment. As elections approach, the IMF warns of the danger of reversing new reforms and calls for statisticians to be shielded from external influence.¹

The recently reduced alimony of private household incomes due to a generous, partly credit-financed pension system has stirred fears that the resulting reduction in consumption has impacted the economy to a greater extent than the cause due to the Keynes-Hicks multiplier. Transitioning to a debt-free state may have exacerbated the problem of structural overconsumption by private households rather than solving it.

¹ International Monetary Fund, European Dept.: Greece: 2018 Article IV Consultation and Proposal for Post-Program Monitoring Press Release; Staff Report; and Statement by the Executive Director for Greece, IMF Staff Country Report, July 2018.

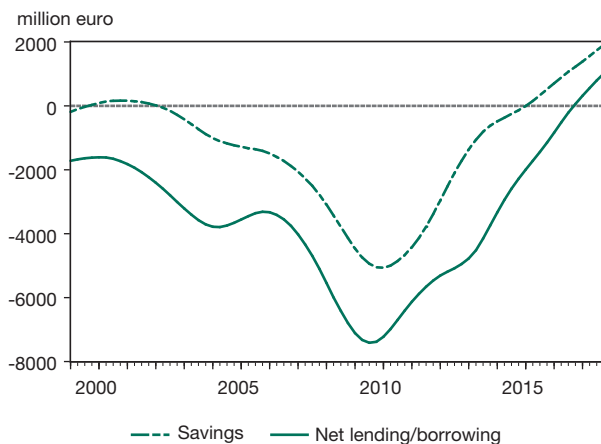
Georg Quaas, University of Leipzig, Germany.

Unfortunately, there is no data on the disposable income of households. Therefore the official data may only be applied indirectly to examine changes in consumption behaviour of the broad masses. However, what the data does demonstrate is that final demand (final consumption expenditure of households, non-profit institutions and general government + gross fixed capital formation) has aligned with gross domestic product (GDP) as can be seen in Figure 2 (data smoothed with HP filter).

The Greek economy reached its highest level in the third quarter of 2007 with a quarterly real GDP of almost 65 billion euros. The global economic crisis and the post-2010 austerity policy have taken an enormous toll on the Greek economy, as seen in Figure 2. The low point was reached in the first quarter of 2013 with a quarterly GDP of 42.7 billion euros – which is not quite accurately depicted in the smoothed curve. This is a 26% reduction in real GDP. While the biggest crisis the German economy had to go through in the post-war period led to a contraction of real GDP by almost nine percent in three quarters within a year (2008Q3-2009Q2), the decline in Greek production stretches over several years and was at a peak of -10% and an average annual value of -3.8%. In percentage terms, the Greek downturn resembles the US economy during the Great Depression – the difference being that the upturn of the ‘New Deal’ is not reflected even in the optimistic official figures. Also shown in Figure 2, final demand has always been higher than domestic production throughout this period. It is not until 2016 that both aggregates seem to come into alignment. At first glance, excessive consumption appears to cease.

Doubts about the sustainability of the achievements thus far are entirely justified. The share of consumption (private and public households combined) in GDP peaked at 91.7% in the second quarter of 2011 and had fallen to

Figure 1
Quarterly government savings and lending/borrowing



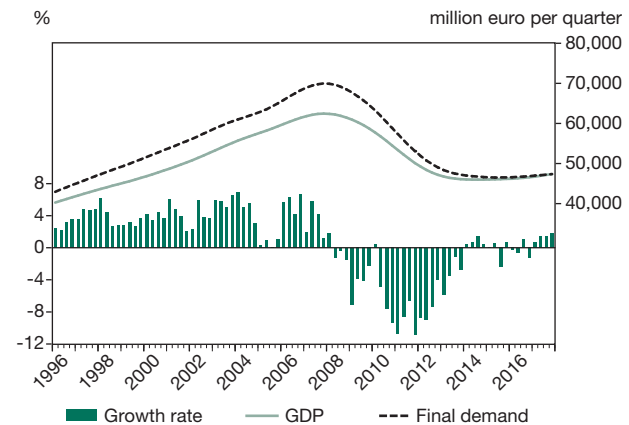
Source: Hellenic Statistical Authority: Quarterly Non-Financial Sector Accounts of General Government (ESA 2010), 1999:1-2018:1, 2018.

89.3% at the end of 2017 by only 2.4 percentage points. Prior to the favourable times of low interest rates due to the introduction of the euro, this figure was around 85%, which is considerably lower. During the austerity period, net exports only occasionally exceeded the zero line by a few billion euros. Since 1995, an accumulated trade deficit of 313 billion euros has been incurred (first quarter 2018), which according to an IMF forecast, will narrow only slightly. Despite the enormous efforts, Greece lived partly at the expense of other countries until the end of 2016 – as was also the case with the US. However, the US has a free-floating currency that adapts to its national circumstances, and US politicians are mostly prepared to ‘pay’ with the country’s property i.e. shares in companies and the state.

The crisis management measures were not only to bring final demand into line with the country’s own production level, but also to initiate structural changes that would ensure sustainable economic recovery. International trade should be balanced and, if possible, yield a surplus to partially repay accumulated debt. Steady investment and moderate growth of the economy as a whole was the desired outcome. Once achieved, ideally unemployment would fall and the population’s prosperity would grow again in the medium term. The structural changes can be seen from the main aggregates of GDP on the expenditure side (Figures 3).

Despite wage and pension cuts that led to mass protests, the share of (real) private consumption in GDP fell by a meagre two percentage points, from 69.6% in the first

Figure 2
Greece’s ‘recovery’ of GDP and final demand



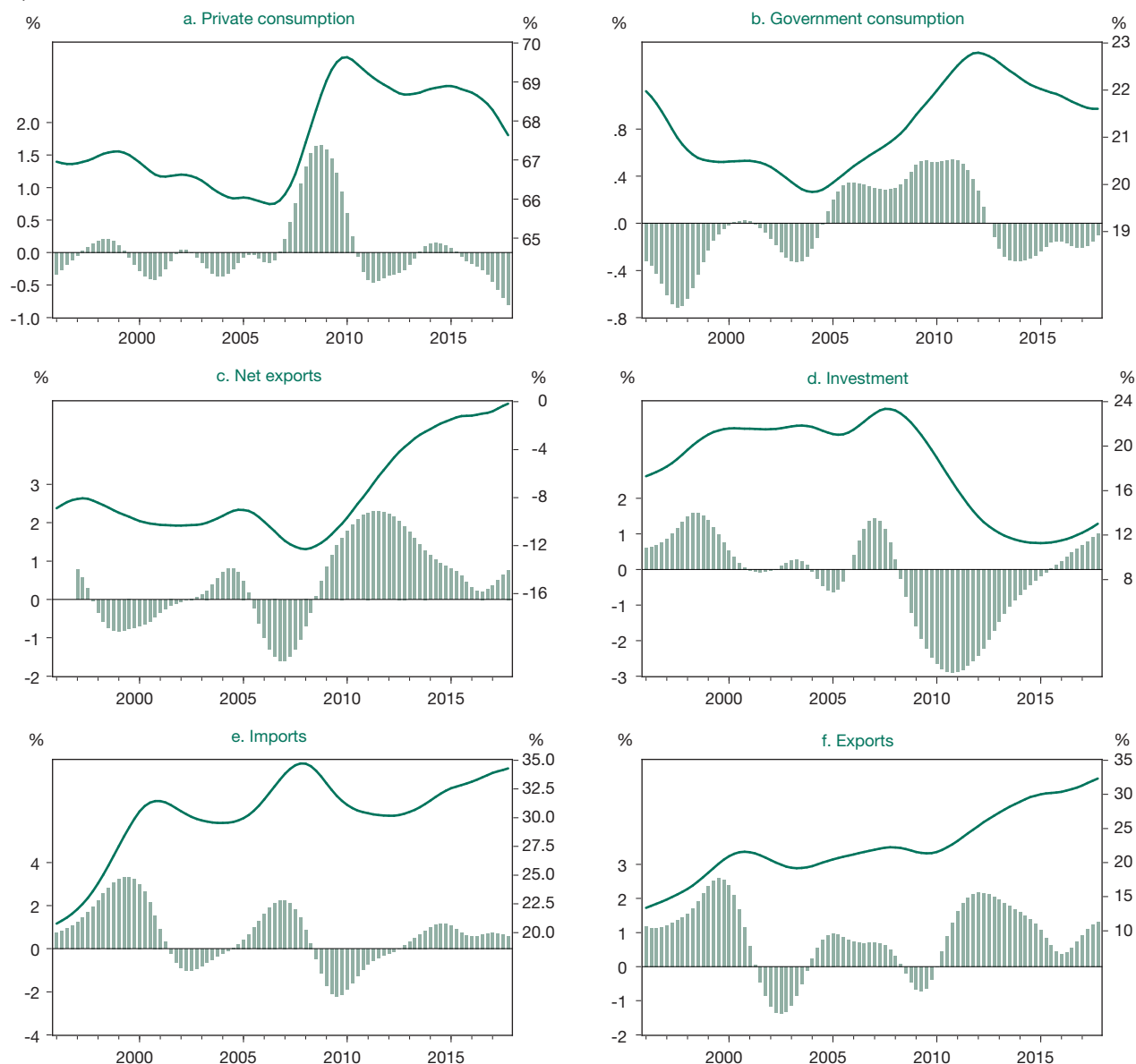
Note: Left scale: quarterly year-to-year change in percent.

Source: Hellenic Statistical Authority: Gross Domestic Product, Quarterly GDP, Non seasonally adjusted, Chain-linked volumes, 1995:1-2018:2, 2018; Hellenic Statistical Authority: Gross Domestic Product, Quarterly GDP, Non-seasonally adjusted, at current prices, 1995:1-2018:2, 2018; own computations.

quarter of 2010 to 67.6% at the end of 2017. This reduction is exaggeratedly shown in Figure 3a because of the stretching of the right scale. The change in government consumption was even smaller: it fell by 1.2 percentage points, from 22.8% in the first quarter of 2012 to 21.6% at the end of 2017 (Figure 3b). On a positive note, net exports (Figure 3c), or the difference between exports and imports, which had been negative for years, increased. At the end of 2017, this aggregate appears to be about to cross the black zero permanently. Considering that the low point was -12% (share of GDP), this is an astonishing development. However, a look at gross fixed capital formation in Figure 3d shows this success was achieved at the cost of investments, which fell by half and were equal to almost exactly the percentage points that net exports increased. If the latter aggregate is broken down into its two components, we see that imports (Figure 3e) have barely been reduced, but exports (Figure 3f) have risen steeply. Imports peaked in the fourth quarter of 2007 with a 34.7% share of GDP. The low point was 30.2% in the first quarter of 2012. In the meantime, imports’ share of GDP has risen again to 34.3% (end of 2017). The positive development of net exports is therefore almost entirely attributable to the increase in gross exports. It is obvious that Greece’s export successes were mainly at the expense of investment and, to a lesser extent, at the expense of consumption. It brings into question what has actually been exported, and what would otherwise have been invested. Without analysing trade structures, it can be assumed that both exports and imports have played a major role in creating this effect.

Figure 3
Development of the main components of GDP

in percent



Note: Right scale: GDP shares in percent; left scale: quarterly year-to-year changes in percent.

Source: Hellenic Statistical Authority: Gross Domestic Product (Non-seasonally adjusted figures) quarterly, chain-linked volumes, op. cit.; Hellenic Statistical Authority: Gross Domestic Product, Quarterly GDP, Non-seasonally adjusted, at current prices, op. cit.; own computations.

The export structure

Data on the structure of Greek exports and imports are available for the years 2010 to 2014.² In the period under review, exports rose nominally by 10%, an average of 2.5% per year. With an inflation rate close to zero, this corresponds roughly to real development. In the assessment, it is important to remember that the GDP fell in the

same period. Despite falling economic output, Greece succeeded in maintaining and even slightly increasing its export level.

If exports are broken down, not only by years but also by goods and services, there is a high degree of continuity in export performance – with slight fluctuations, of course. Significant changes (more than one percentage point) in the structure of 2014 compared to 2010 (measured by changes in the share of total exports) occurred in only two

² Hellenic Statistical Authority: Supply and Use Tables, 2010–2014, 2018.

categories. One group of goods is coke and refined petroleum products (+9.7 percentage points), and the other is transport services by water (-9.5 percentage points). In absolute terms, exports of coke and refined petroleum products increased by 4.8 billion euros to total 10.2 billion euros in 2014, while shipping services to other countries decreased by 2.8 billion euros to total 11.8 billion euros in the same year. It is therefore clear that the most important pillar of Greek foreign trade is still shipping services (even if they are declining). Energy sources such as petrol and coke, some of which are produced in Greece, are gaining importance. By comparison, growth in exports of computers, electronic and optical products (+0.6 percentage points), and construction services (+0.5 percentage points) is rather modest.

The import structure

From the year 2010 to 2014, imports fell by just under 11% in nominal terms, an average of 2.7% per year. This is the delayed effect of austerity measures which led to a reduction in GDP and thus also in demand for imported products. Similar to exports, the structure of imports is predominantly characterised by continuity. There were significant changes (more than one percentage point) in the import structure in 2014 compared to 2010 (measured by the shares of total imports) of four groups of goods. The share of imports of transport equipment (-3.8 percentage points) and support services for transport (-3.7 percentage points) in the total volume of imports has fallen, while the share of imported mining products (+6.5 percentage points) and coke and refinery products (+3.4 percentage points) has risen. In absolute figures, imports of mining products increased by 2.9 billion euros to total 12.3 billion euros and imports of coke and refinery products increased by 1.6 billion euros to total 5.3 billion euros. Conversely, imports of transport equipment fell by 2.9 billion euros to 3.2 billion euros total and imports of support services for storage and transport fell by 2.9 billion euros to 3.1 billion euros total.

The figures suggest that exports of shipping services and corresponding aid have been reduced because these services are used in Greece, i.e. in the transport of mine products, crude oil, coke and refinery products that are either refined domestically or simply resold. Coke and refined petroleum products represent a clear case of intra-industry trade or cross-hauling.³ In 2014, these goods were purchased for 5.3 billion euros and sold abroad for 10.2 billion euros.

3 T. Kronenberg: Derivative Construction of Regional Input-Output Tables under Limited Data Availability, Preprint of the Research Centre Jülich, 2007.

Table 1

Sectors with expanding economic activities

Branches	in million euros	in %
Mining and quarrying	5 840	1.9
Coke and refined petroleum products	13 203	4.2
Computer, electronic and optical products	10 194	3.2
Machinery and equipment n.e.c.	11 463	3.7
Motor vehicles, trailers and semi-trailers	3 862	1.2
Other transport equipment	15 871	5.1
Constructions and construction works	61 477	19.6
Computer programming, consultancy and related services; information services	3 975	1.3
Scientific research and development services	5 660	1.8

Source: Hellenic Statistical Authority: Supply and Use Tables, 2010-2014, 2018; own computations.

Capital structure

The changes in the technological base of the Greek economy in the first years of crisis management are illustrated by the cumulative net investments from 2010 to 2014. Negative net investments mean a reduction of capital stock, while positive investments result in an increase. The structural changes should be considered with the knowledge that economic capital has been massively reduced, by 42 billion euros, from 2010 onwards. Out of the 65 branches of the economy covered, 51 have seen a reduction in their capitalisation, while 14 have experienced a slight build-up. As with the trade structure, however, some branches occupy a prominent position. Table 1 shows the expanding economic activities in terms of accumulated net capital formation which is identical to a change of the capital stock. It is measured in million euro and in percentage shares of the total change in capital stock.

The construction industry is the frontrunner. While it has little impact on international trade data, it still accounts for almost 20% of total changes in the capital stock. The capital base for production of transport equipment comes in second. This capital stock was dismantled in the first three years and then rebuilt, which could be a sign of re-orientation from a technological basis of transport services for other countries to one that serves its own economy. However, this is only a hypothesis based on the figures. In third place is the capital of coking plants and refineries. It forms the technological basis for the increasing exports of coke and refinery products. Only then does the more

Table 2
Shrinking sectors

Branches	in million euros	in %
Products of agriculture, hunting and related services	-9355	-3.0
Food products, beverages and tobacco products	-6872	-2.2
Textiles, wearing apparel and leather products	-4658	-1.5
Wholesale trade services, except motor vehicles and motorcycles	-4987	-1.6
Retail trade services, except motor vehicles and motorcycles	-3845	-1.2
Land transport services and transport services via pipelines	-5901	-1.9
Water transport services	-13324	-4.2
Accommodation and food services	-4395	-1.4
Telecommunications services	-5485	-1.7
Real estate services without imputed rents	-23465	-7.5
Imputed rents	-31388	-10.0
Rental and leasing services	-4421	-1.4
Public administration and defence services; compulsory social security services	-25454	-8.1
Education services	-6237	-2.0

Source: Hellenic Statistical Authority: Supply and Use Tables, 2010-2014, 2018; own computations.

traditional mechanical engineering sector, which has also been slightly strengthened, come into play. What is perhaps surprising is the fact that Greece is expanding its capital stock for the computer industry in both hardware and software as well as for scientific research.

Table 2 illustrates industries with decreasing economic activities in terms of accumulated net capital reduction, which is identical to a (negative) change in the capital stock.

The housing industry is most affected by the savings in investments, accounting for 17.5% of total decline of the capital stock. This is followed by the state, especially with its investments in the military, social services and education. The reduction of the capital base of the transport system by waterways is also noteworthy as it supports the above hypothesis of a reorientation of the transportation system.

Assessment of structural changes

It would be pointless to assess strategies and analyse structural changes of an economy that are the result of

one spontaneous process alone. With Greece, we are looking at an economy heavily affected by economic policy measures. One can assume that the development outlined above is the result of a combination of targeted economic policy and a somewhat spontaneous evolution of the market economy. How should the underlying strategy be evaluated? Moreover, by what criteria should it be measured? It is clear that the evaluation refers to the direction taken, not the measures implemented.

A standard instrument for evaluating economic policy interventions is based on the empirical determination of the multipliers of various sectors of an economy.⁴ The Hellenic Statistical Authority compiles supply and use tables comprising 64 national sectors (called industries). Every industry or branch corresponds to a special group of similar products. A multiplier shows how strongly a branch is interlinked with all other branches. An increase in demand for the products in a sector entails a higher demand for their suppliers, and increases the performance of the whole economy. A multiplier of one indicates a zero-degree interconnectedness, i.e. increased demand for the products of this sector has no effect on the other sectors. The highest multiplier, as average from 2010 to 2014, is 3.57 and concerns the production of paper and paper products. From the viewpoint of the input-output analysis and its multiplier theory (not to be confused with the theory of the Keynes-Hicks multiplier with its astronomical expected values), the result is that an increase in paper production by one billion euros would encourage a number of suppliers to produce more and the total output would increase by 3.57 billion euros.

It would be ridiculous to recommend that the Greeks promote paper production, however. With a share of 1.5% of total output in 2014, the weight of this group of goods in the range of different products is far too small to represent a promising strategy even in the short term. If the multiplier is weighted subject to the size of the branch, which is measured by its share of output in 2014, a measure is obtained which can be interpreted as an impact indicator. Sorted according to its size, it allows an evaluation of the industry's impact on the national economy. Table 3 shows the ranking of the five most important expanding and shrinking branches based on their interconnectedness (Rank_m), their weight in the range of goods produced (Rank_s) and the proposed combined index (Rank_t).

4 R.E. Miller, P.D. Blair: Input-Output Analysis. Foundations and Extensions, Second Edition, Chapter 6, New York, 2009, Cambridge University Press.

Table 3
Ranking of rapidly changing branches

	Rank_m	Rank_s	Rank_t
The five most expanding branches			
Constructions and construction works	14	11	7
Other transport equipment	38	63	62
Coke and refined petroleum products	5	4	1
Machinery and equipment n.e.c.	21	47	43
Computer, electronic and optical products	25	59	57
The five most shrinking branches			
Imputed rents	61	5	9
Public administration and defence services; compulsory social security services	56	1	5
Real estate services without imputed rents	63	7	12
Water transport services	19	8	6
Education services	62	12	19

Note: Table 3 shows the ranking of the five most important expanding and shrinking branches based on their interconnectedness (Rank_m), their weight in the range of goods produced (Rank_s) and the proposed combined index (Rank_t).

Source: Hellenic Statistical Authority: Supply and Use Tables, 2010-2014, 2018; own computations.

Table 3 shows that promoting the production of coke and refined products was a direct strategic hit. This branch has both a high interconnection and a high weight. Apart from this exception, the other expanding branches have neither particularly high multipliers nor a particularly high weight. In the case of shrinking branches, it is strategically advantageous for the whole economy that they have small multipliers and low weight, i.e. that they occupy the rear ranks. As you can see, this is not the case with the branches particularly affected by the austerity measures. Notably, the reduction of the capital stock of water transport services seems to have been a strategic mistake.

With the major exception of the production of coke and refinery products, the structure of investments in capital stock is not optimal. Both the weight of the individual branches and the intensity of their interdependence with other branches were considered. It turns out that it is not the construction industry but the production of coke and refinery products that is most worthy of support. The following is a ranking of other sectors of the economy (excluding for government-funded ones) that would have been worthwhile to promote and probably still are: Accommodation and food services (Rank_t: 2); food prod-

ucts, beverages and tobacco products (3); wholesale trade services, except of motor vehicles and motorcycles (4) and water transport services (6).⁵

Consequences and outlook

In light of the development observed, only one recommendation remains: the general conditions for investment, especially foreign direct investment, should be improved. This is a crucial condition for strengthening labour productivity and thus competitiveness in international markets, thereby making increased export activity pay for imports with tangible assets. Positive net exports would not only be evidence of sufficient economic savings, they would also cause a normalisation of consumer behaviour. This is not the result of a further reduction in consumption but due to an increase in household disposable income.⁶

The reality, however, is completely different at the moment. Rather than a strengthening, the austerity policy has led to a weakening of investments. Politicians prefer the direct path of increasing consumption to the indirect path of improving investment activity. "Greek Prime Minister Alexis Tsipras has promised higher wages and pensions as well as lower taxes for the coming months and years," the FAZ reported on 8 September 2018, only a few weeks after Greece left the EU rescue umbrella.⁷ The IMF warns against extending collective agreements negotiated for individual prospering companies to entire sectors.⁸ However, politicians are determined to do just that.⁹ One can conclude that Greece will continue to be a problem child of the European Union, even though it appears that a balanced national budget has also roughly eliminated the current account deficit. The IMF report forecasts growth of two percent this year and 2.4% in 2019.¹⁰ However, this was prior to the realisation that the latest official forecasts dating from April 2018 were overly optimistic in their assessment of global economic development and they have been accordingly revised downwards.¹¹

⁵ The full results of the impact analysis can be found here: Impact Analysis of the Greek Economy 2010-2014, updated 2018, available at www.forschungsseminar.de/greece.htm.

⁶ G. Quaas: Tendenzen und Determinanten einer Überkonsumtion, *Ökonomenstimme*, 14 October 2015.

⁷ Frankfurter Allgemeine Zeitung: Tsipras verspricht Griechen wieder steigenden Lebensstandard, *faz online*, 8 September 2018.

⁸ International Monetary Fund, European Dept., op. cit.

⁹ Ibid.

¹⁰ Ibid.

¹¹ International Monetary Fund: World Economic Outlook, October 2018: Challenges to Steady Growth, Washington, DC 2018, IMF.