

# Economic Review

September 2018





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# Table of contents

AMERICA'S NEW TRADE POLICY AND ITS IMPACT ON THE BELGIAN ECONOMY	7
WHAT WILL HAPPEN WHEN INTEREST RATES GO UP?	35
THE RISE OF THE SHARING ECONOMY	57
DOES JOB POLARISATION IMPLY WAGE POLARISATION?	79
RECENT INTERNATIONAL TRENDS IN CORPORATE TAXATION: MORE COMPETITION OR MORE CONVERGENCE?	91
CONVENTIONAL SIGNS	125
LIST OF ABBREVIATIONS	127



# America's new trade policy and its impact on the Belgian economy

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## Introduction

On 20 January 2017, Donald Trump became the 45<sup>th</sup> President of the United States. Twenty months later, he had put up customs duties on washing machines and solar panels, on steel and aluminium, and on thousands of Chinese products. And he plans to impose higher taxes on imported motor vehicles too. These unilateral actions by the world's leading economy have aroused international consternation and led many trading partners to take retaliatory measures.

How can we explain the protectionist turn of the United States? What are the economic implications? Is the Belgian economy vulnerable? These are the main questions that this article tries to answer. The first part attempts to explain why the United States, fervent advocates of free trade since the Second World War, have done an about-turn today. The second part looks into the Trump Administration's vision of trade, its Trade Policy Agenda and its atypical approach to this subject. The third part sets out the actions that have been taken and the retaliatory measures they have triggered. It takes a look at their economic effects and discusses the costs of a potential trade war. Lastly, the fourth part analyses the Belgian economy's exposure to the trade restrictions adopted and to a possible protectionist spiral. It is based on the value added approach, which is the most relevant here.

## 1. America's protectionist turn

### *Wave of scepticism about free trade*

American leaders in general – and the Republican Party in particular – have long since been in favour of opening up trade. The United States set themselves up as a spearhead for the post-war trading system and the resultant liberalisation of international trade. With the help of their allies, they established the GATT in 1947 and replaced it by the WTO in 1995<sup>(1)</sup>.

(1) The General Agreement on Tariffs and Trade (GATT), which was signed in 1947 by 23 countries and entered into force in 1948, served as a multilateral framework for the liberalisation of world trade for almost 50 years. It was replaced in 1995 by the WTO, which today has 164 member states. One major difference between the GATT and the WTO lies in the dispute settlement system. When the WTO was established, a dispute settlement body with powers to hand down binding rulings was set up along with it. The latest round of multilateral trade negotiations under the auspices of the WTO was launched in Doha back in 2001. It is aiming for better integration of developing economies into the global trade system and a reform of the WTO. But it is far from complete. The most controversial subjects concern farm subsidies, intellectual property rights, and the reform of the dispute settlement mechanism. The difficulty of moving ahead at the multilateral level encountered in recent years has led to a multiplication of preferential trade liberalisation agreements.



By contrast, the last few years have been marked by an exacerbation of populism and nationalist sentiment, whereby a good many of the economic problems facing the working and middle classes are blamed on international trade and immigration (Handley and Limao, 2017). The traditional attachment to liberalisation of trade has fizzled out somewhat, triggering a wave of scepticism that Donald Trump not only drew on for his campaign, but actually fuelled himself in his run to the White House<sup>(1)</sup>.

This distrust of free trade is partly due to the disillusion caused by an unequal distribution of the costs and benefits of economic globalisation. In the view of most economists, the economy as a whole benefits from an opening to trade: an economy is more efficient when it is exposed to international competition, which in turn boosts productivity. Moreover, consumers and producers alike can enjoy a wider variety of products and services. Lastly, specialisation and economies of scale encourage lower production costs and prices. They nevertheless acknowledge that some workers and regions generally bear a disproportionate share of the adjustment costs related to international trade. If it is to be equitable, globalisation should thus be coupled with an efficient redistribution and with employment and education policies that promote the professional reintegration of badly affected workers.

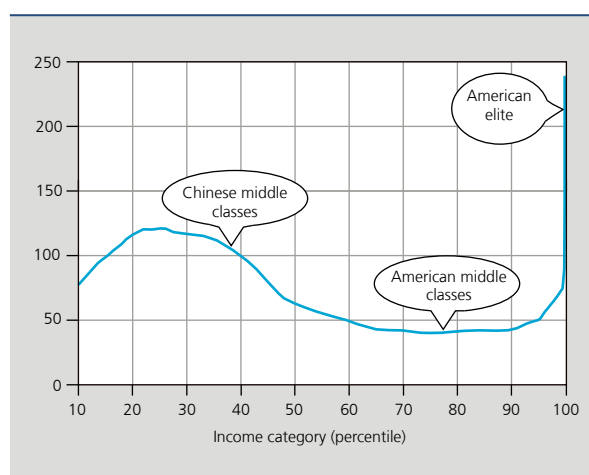
A well-known study by the World Bank (Lakner and Milanovic, 2013) has shown that, since the 1980s, the lower and middle classes in advanced economies scarcely saw any increase in their incomes. By contrast, the Chinese middle class and the economic elites became substantially wealthier (see chart 1).

Owing to its economic clout, its rapid growth and its economic activity geared towards exports, China's integration into the world economy in the 1990s and 2000s has had particularly important consequences for American workers (Senses, 2017). In another study that has received wide coverage, Acemoglu *et al.* (2016) reveal that, between 1999 and 2011, the rise in US imports from China brought about a net loss of 985 000 jobs in manufacturing and almost two million jobs throughout the economy. Out of a total 5.8 million jobs lost in manufacturing between 1999 and 2011, 17 % were estimated to have been caused by the rise in imports from China, the rest being down to technological progress, automation<sup>(2)</sup> and the 2008-2009 economic and financial crisis.

Although international trade's direct responsibility for the loss of manufacturing jobs in the United States is relatively limited, its image has deteriorated, not least because of the sectoral and geographic concentration of its costs (Schneider-Petsinger, 2017).

**CHART 1** DECLINE IN RELATIVE INCOME OF AMERICA'S MIDDLE CLASSES

(in %, growth of income per adult, 1980-2016 period)



Source : World Inequality Database.

(1) During the 2016 presidential election campaign, the Democrat candidates Hillary Clinton and Bernie Sanders also used language calling into question trade agreements that had already been concluded, such as NAFTA and the TPP.

(2) It is nevertheless not easy to make a distinction between the effects of trade and those of technological progress, as the two developments came together and could have fuelled each other.

Citizens with the lowest levels of education have been particularly affected, while job losses and slow wage growth in the manufacturing sector have rubbed off on the general economic situation in several regions (Senses, 2017). The concentration of undesirable effects of globalisation within certain communities has struck a particular chord with them<sup>(1)</sup>.

The publicity surrounding the “unfair” trade practices of certain countries – dumping, subsidies, state-owned enterprises, or even currency manipulation – has also tarnished the image of the global trading system and entertained the idea that the ground rules were either not fair or not being respected, to the detriment of the United States. Chinese policies have been singled out for criticism in this respect.

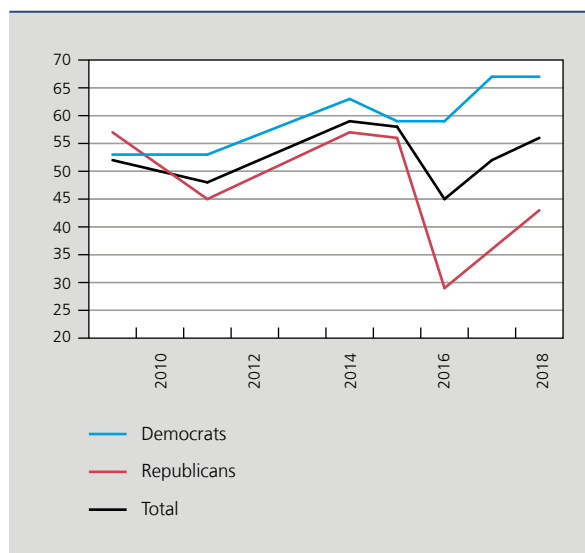
Lastly, with customs tariffs having stabilised at low levels since the 2000s, recent rounds of trade talks have focused more on non-tariff measures (regulations, standards, norms, etc.). And so, fears have emerged that trade agreements impinge more directly on the domestic prerogatives of governments and jeopardise the sovereignty of States. In this context, the general public’s scrutiny of international trade matters has grown (Schneider-Petsinger, 2017). The lack of transparency in recent negotiations on trade pacts by the US government has also reinforced suspicion of them.

All these different elements help to explain why support for free trade had fallen off before the 2016 presidential elections, a trend that has to be seen in the wider context of the American people calling into question the long-presumed convergence of its own interests with global prosperity (Kandel, 2018).

### ***Strong partisan polarisation***

It is interesting to note that the perception of free trade has evolved in conflicting ways among Republican and Democrat voters over the last decade. For a long time, the Republicans had ardently defended free trade<sup>(2)</sup>, while the Democrats had remained more reticent. Since 2010, however, Democrat voters have become more positive than their Republican counterparts, and the percentage of Democrats regarding trade pacts as beneficial for the country has even been on the rise (see chart 2).

**CHART 2** SENTIMENT TOWARDS FREE TRADE IN THE UNITED STATES<sup>(1)</sup>



Source : Pew Research Center.

(1) Percentage of positive replies to the question: “In general, do you think that free trade agreements between the US and other countries have been a good thing or a bad thing for the United States?”.

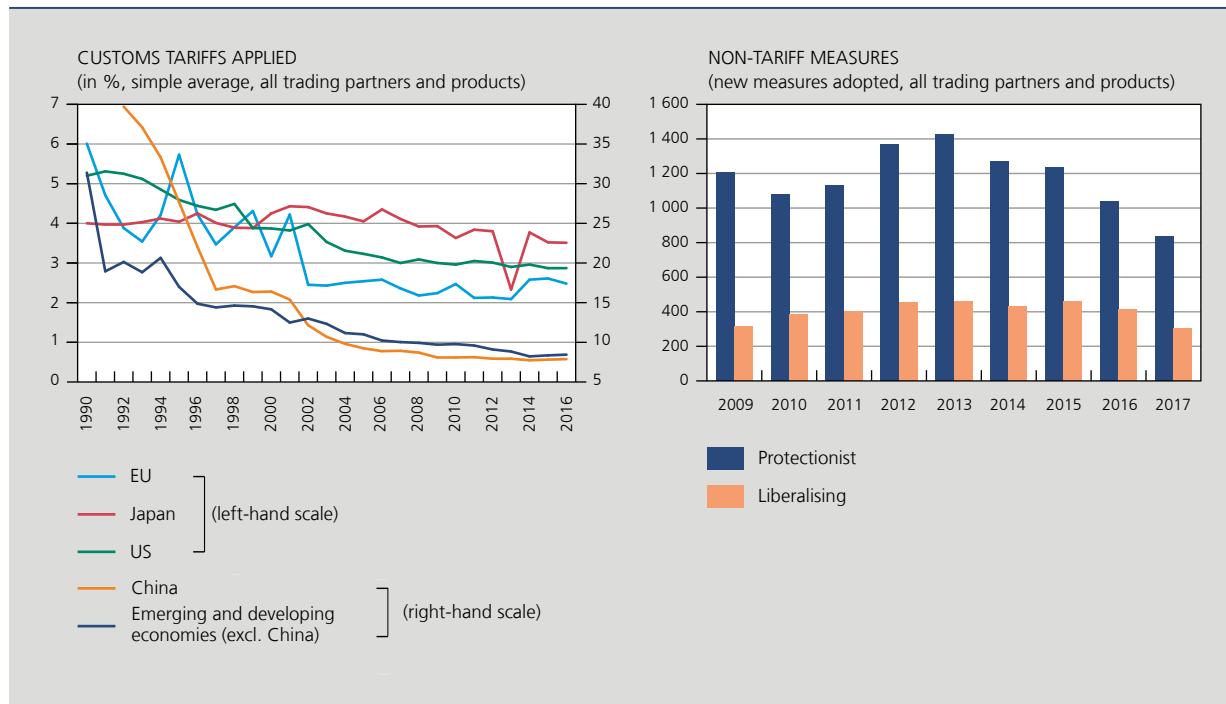
(1) According to Senses (2017), the communities affected the most by globalisation turned, more so than before, to more extreme candidates in the 2016 elections.

(2) When NAFTA was adopted by Congress in 1993, the vast majority of Republican members voted in favour of it, while the Democrats on the whole rejected the agreement.

The sharp drop in the share of opinions in favour of free trade agreements in the Republican camp in 2016 alone is edifying and testifies to the reach of Donald Trump’s discourse. The other Republican leaders have, on the whole, remained strongly attached to free trade, something which also points up the gulf between the party elite and its voter base. Donald Trump stood out as the working class voters’ candidate and, more specifically, as their protectionist candidate (Stahl, 2016)<sup>(1)</sup>.

### Rise in protectionism

**CHART 3** CHANGES IN AVERAGE TARIFFS AND NON-TARIFF MEASURES



Sources: World Bank, Global Trade Alert Database.

Despite the multiplication of trade agreements and contrary to popular belief, protectionism has gained ground across the world over the last two decades. The removal of tariff barriers has actually been more than offset by an increase in non-tariff barriers, which nowadays are the main source of trade protection (Gunessee *et al.*, 2018 – see chart 3). The rise of protectionism is to be seen against a background of wide balance of payments imbalances at the international level. In parallel with the slowdowns in investment, in trade liberalisation and in fragmentation of global production chains, it has contributed to a deceleration of growth in international trade over the last few years (IMF, 2016).

(1) Since the November 2016 presidential elections, sentiment about both international trade and free trade has improved, a trend most probably related to the economic upturn and, more particularly, to favourable developments on the jobs front. The partisan polarisation has nevertheless remained significant (Jones, 2018).

## 2. International trade as seen by the Trump Administration

The Trump Administration's Trade Policy Agenda seeks "to expand trade in a way that is freer and fairer for all Americans"<sup>(1)</sup>. But hidden behind this wording is a distinctly more restrictive and more aggressive trade policy orientation, that promises to put American interests first.

### *A mercantilist vision*

For many observers, President Trump and his advisers see international trade as a zero-sum game: what one country wins, the other one loses. Under this mercantilist view of trade, the US trade balance serves as a proxy for evaluating the success or failure of the global trading system and of US trade policy, as well as bilateral trade relations (Jackson, 2018).

The heavy US trade deficit is perceived in this context as a cost for the American economy. It would appear to portray a trading system that is detrimental to the United States, while bilateral deficits would simply reflect "unfair trade practices" on the part of trade partners who "abuse the system" and "distort competition".

(1) USTR (2017).

### Box 1 – The US trade deficit: an effective economic yardstick ?

The US has posted a trade deficit since the second half of the 1970s. It grew considerably wider at the end of the 1990s and in the early 2000s. After contracting sharply during the recession, it took off again and, in 2017, had reached \$ 552.3 billion, or just under 3 % of America's GDP.

But hidden behind this consolidated figure is a largely positive services trade balance, of some \$ 255.2 billion, and an extremely negative trade balance for goods, to the tune of \$ 807.5 billion. American imports of goods are dominated by IT and telecommunications equipment, clothing, electronic appliances, motor vehicles and crude oil (see chart 6). US exports of services mainly concern tourism, intellectual property and financial services.

In the eyes of many economists, the United States' trade deficit stems largely from its macroeconomic policy, which causes a structural imbalance between financing requirements and domestic savings, making it necessary to borrow from abroad. The dollar's status as the global reserve currency also encourages the United States' external indebtedness – as a natural counterpart to the trade deficit – by enabling the country to borrow cheaply from the rest of the world (Pettis, 2011).

Among the main factors regularly cited to explain the explosion of the US trade deficit since the 1990s are: (1) a relatively stronger economic growth rate in the United States than in Europe or Japan, (2) the integration of China into the global economy, (3) a decline in savings by American households and firms, (4) a rise in the US budget deficit, and (5) bigger inflows of foreign capital into the United States after the 1997 Asian crisis.

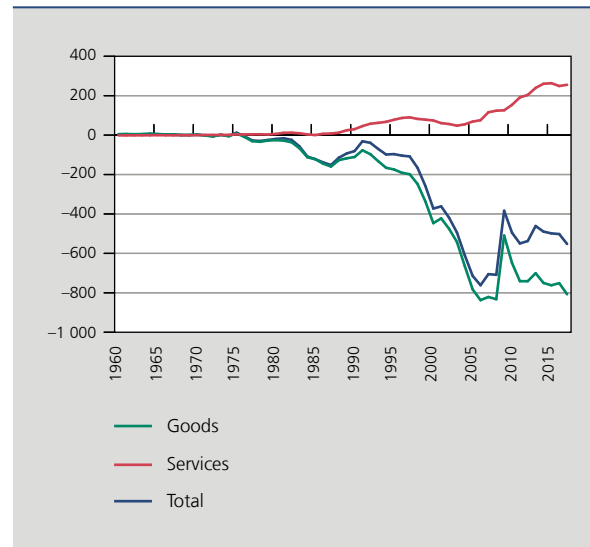
The Trump Administration puts the emphasis on bilateral goods trade balances. It has also launched a study into deficits run up with key countries like China, Germany, Mexico and Japan. Moreover, it places reduction in bilateral trade deficits at the heart of the renegotiation of the United States' trade agreements.

In 2017, the deficit in the balance on goods came to \$ 375 billion with China, \$ 151 billion with the EU – some \$ 64.3 billion of which was with Germany alone –, \$ 71 billion with Mexico and \$ 68 billion with Japan (see chart 5).



### THE UNITED STATES' TRADE BALANCE

(in \$ billion)



Sources: OECD, US Census Bureau.

An economic diagnosis made on the basis of trade balances between two countries is not always reliable, for two basic reasons. On the one hand, these statistics are sometimes rather fragile. As proof, figures for Europe's trade surplus with the United States published respectively by Eurostat and the Bureau of Economic Analysis (BEA), its American counterpart in the field of trade statistics, differ considerably. On the other hand, this kind of analysis disregards global value chains, which are nonetheless an undeniable economic reality nowadays.

#### *Fragile statistics*

In principle, the United States' trade deficit with Europe as measured by the Europeans should be identical to that estimated by the Americans. But in reality, the official figures do not obey this theoretical self-evidence. These 'mirror' statistics, so-called because they reflect the same thing estimated by each of the counterparties involved in the transaction, are not always consistent. For the year 2017, for example, Eurostat reports a US deficit with the EU28 for trade in goods and services of € 187 billion, or \$ 211 billion. At the same time, the BEA notes a deficit of \$ 102 billion. This gives a difference of \$ 109 billion between the American and European figures, \$ 32 billion of which comes from trade in goods and \$ 77 billion from services.

Several elements<sup>(1)</sup> can help explain the divergences in 'mirror' statistics. Unlike exports, imports include the cost of transporting goods from the border of the exporting country to that of the importing country<sup>(2)</sup>. The value of the transaction can therefore be calculated differently by the importing country and by its exporting counterpart. Moreover, it is not always easy to identify the trade partner, especially when the product transits several countries

(1) Other elements than those cited here may contribute to divergences, such as the fact that some trade flows are confidential, or the exchange rates applied when the transaction is denominated in foreign currency are not necessarily harmonised (Javorsek, 2016).

(2) Exports are estimated at "free on board" prices, which includes the transaction value of the product and the cost of dispatching the product to the exporting country's border. On the import side, the price is calculated as "cost, insurance and freight", i.e., it also incorporates costs of transporting the goods from the border of the exporting country to that of the importing country.



before reaching its final destination. The widespread practice of re-exporting, which sometimes entails very large trade margins, compounds the difficulty of attributing the exact amounts to the country of origin and of final destination<sup>(1)</sup>. Also, trade in services generally tends to involve billing for deliveries between subsidiaries and their parent companies, for which strategic or tax options may be involved (Felbermayr and Braml, 2018). The scale of the statistical difference is nevertheless striking. Either way, the difficulty of compiling balance of payments statistics points up the hazards of economic reasoning based on them.

### ***Statistics that are difficult to interpret***

Assuming that a country receives a positive income relative to a partner country when the bilateral trade balance is in its favour, may be misleading. It is also incorrect to think that more business activity – and consequently employment – is located in the country with the surplus. Such an interpretation does not take into account the fact that exports from a country very often contain foreign inputs, whether raw materials, semi-finished products, or services. As a result, income from exports, or in other words the domestic value added in a country's exports, is lower than the total value of exports. Crucially, that value added content differs greatly from one country to the other. In particular, it depends on the size of the country and its degree of openness to international trade (Baldwin and Lopez-Gonzales, 2013). However, it is that value added content only that reflects the business and job opportunities generated by the export activities. Re-exports are a case in point. For example, when Singapore, the Netherlands or Belgium re-export products, the total export value is credited to them, whilst their actual income is limited to any commercial or transport margins.

There is an economic concept by which exports and the income generated through exports can be reconciled with each other. This is the concept of trade in value added (Johnson 2014; Koopman *et al.*, 2014). Contrary to gross trade (imports and exports) which includes the foreign value content, these data isolate the domestic value added component of exports. Compared with the bilateral import/export balance, the value added balance is a more relevant indicator of the profits (or losses) from trade in terms of income and employment (Foster-McGregor and Stehrer, 2013; Timmer *et al.*, 2013). Albeit useful, the data on trade in value added have a couple of weaknesses. They only become available with a considerable time lag<sup>(2)</sup>. For example, 2011 is the latest year for which the TiVA data cited in this article are available. They are also derived from an international input-output matrix, the composition of which needs to be weighed up against the official figures published by national statistics offices (Ahmad, 2013; Timmer *et al.*, 2016).

### ***A reverse diagnosis for Belgium***

As can be seen from table 1 on page 24, for the period 2015-2017, Belgium had an annual trade surplus with the United States of € 3.5 billion. That is substantial, considering that Belgium's total balance of trade (including all trading partners) was approximately € 5 billion. From these figures, it could be hastily concluded that the United States is more of a customer of Belgium than a supplier, which would imply that the latter would stand to lose the most in case of a trade war.

However, the diagnosis is reversed if one analyses the amounts traded in value added over the period 2009-2011 (see chart). The surplus with the United States turns into a small deficit. Belgian value added in American imports is not higher than American value added in Belgian imports. The United States' weight as a supplier is at least equal to its weight as a customer. This point cannot be ignored, as it means that both economies' mutual exposure is very similar.

(1) Ideally, it is the country of origin of the product that should be reported on the import side, and not the country from which it was finally imported and through which the goods may have simply transited. Likewise, on the export side, the country of known final destination should be declared if the goods are first sent to a transit country.

(2) After all, they are based on input-output matrices that are published only once every five years, with a delay of three years.

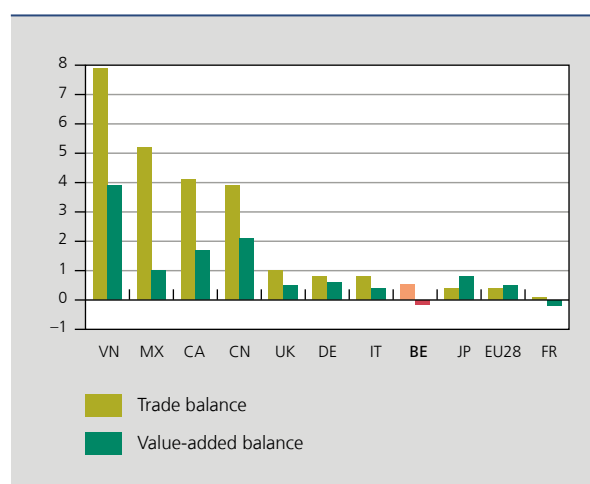


An obvious question is therefore why the balance in trade and the balance in value added produce two such different results. The answer to this enigma lies in the divergent value added content. Contrary to the United States, the productive capacity of a small open economy such as Belgium relies a great deal on imported resources. The share of the value added in exports is smaller in Belgium than in the United States. In simple terms, the United States primarily exports products that are 100 % American. Belgium, on the other hand, exports products of which only certain stages of the production chain take place on its territory whilst the earlier stages of production take place abroad. Going from the gross concept to that of value added entails a far greater correction in Belgium than in the United States, which automatically reduces Belgium's balance of trade against that of the United States.

By means of comparison, the balances of trade in value added of Vietnam, Mexico and China with the United States are lower than the corresponding balances of gross trade. This can be explained by the fact that those countries are specialised in certain stages of production into which many foreign components are integrated. That is not the case however for Japan and the EU28 as a whole.

#### BALANCE WITH THE UNITED STATES

(in % GDP<sup>(1)</sup> of the country concerned, average 2009-2011)



Source : Own calculations based on TIVA data.

(1) After deducting taxes minus subsidies on products.

Clarification : These balances were calculated on the basis of trade in goods and services. The balance for trade in value added is calculated on the basis of the flows that feed into domestic demand and exports. It differs from the TIVA data which only takes into account the flows that feed into domestic demand.

Most economists agree that a bilateral trade deficit has only minor relevance from an economic perspective : a surplus/deficit simply means that a country is very/not at all specialised in the production of goods or services that the other country wishes to buy. The bilateral balances reflect a country's economic characteristics more than its trading practices. Those trade balances are also inflated by the development of global production chains and by the way in which international trade is measured (see box 1).

An economy's total trade deficit is more relevant and in the long term potentially problematic<sup>(1)</sup>. After all, it is an indication of growing foreign debt and increasing vulnerability to potential economic shocks from outside. Conventional

(1) The long-term impact of external indebtedness is greatly determined by the use of its proceeds. It is certainly problematic if the external debt in question is used to finance consumption rather than productive investments that contribute to raising the future standard of living.

wisdom has it, however, that this deficit is rather the consequence of a country's macroeconomic policy and the effects of that policy on savings, consumption and investment, than its trade policy or that of its partners.

The static vision of the world according to which the higher the production realised in the United States, the stronger its export position, is in direct opposition to David Ricardo's theory of comparative advantage<sup>(1)</sup>, as well as to the current organisation of global production. More specifically, the considerable development of global value chains over the past few decades has made it possible to benefit from greater specialisation and the associated economies of scale.

### ***Protectionist agenda***

The current US Administration's trade agenda rests on three cornerstones that should help curb the country's trade deficit:

Firstly, it wants to impose stricter compliance with the existing trade agreements and to punish "unfair" practices such as for example dumping, state aid, currency manipulation, or the imposition of duties considered excessive compared to the equivalent US tariffs. The actions that are adopted or envisaged in this respect aim to protect US industry and repatriate production to the United States.

It should be noted that, on average, customs duties do not differ that much between the advanced economies<sup>(2)</sup>, even though significant differences can sometimes be seen for specific products. Emerging and developing economies usually apply higher duties. However, those countries have agreed to the greatest relative reductions over the last two decades.

Secondly, the Trump Administration plans to put an end to – or start new negotiations for – some trade agreements if "the goals are not reached". The purpose of this is to restore trade balances by favouring production in the United States and encouraging exports from the United States.

Thirdly and finally, he is planning to reform the operations of the WTO and more specifically its mechanism for dispute settlement, which is criticised for "judicial activism", deemed disadvantageous to US interests<sup>(3)</sup>, and blamed for not enforcing the rules. To express its hostility towards the institution, the US government is currently refusing to appoint new judges, which directly compromises the operations of the institution.

The concept of national sovereignty plays a key role in the current US President's argument against the operations of the WTO and of the multilateral trading system. The reference in Donald Trump's trade policy agenda to President George Washington's farewell address, which warned against any form of interference by foreign powers and spoke about the United States' isolation, is revelatory in that respect.

Other elements of American economic policy could go against the objective of reducing the trade deficit. On the one hand, the expansionary fiscal reform adopted early 2018 tends to foster imports. On the other hand, the introduction of tariffs, which can fuel inflation, could lead to a tighter monetary policy. An increase in interest rates by the Federal Reserve would contribute to the appreciation of the dollar, thereby penalising exports. In such a case, the US trade deficit could rise even more.

### ***An assertive and demanding approach***

The US Administration is determined to use its vast discretionary power<sup>(4)</sup>, and its approach means an unprecedented turnaround in US trade policy. Its measures are based on a broad interpretation of American laws, which authorise unilateral actions to restrict imports and to circumvent international rules. Three laws in particular are invoked, which allow the

(1) According to the theory of comparative advantage, a country benefits from specialising in the production of goods for which its opportunity costs are the lowest (irrespective of the absolute production costs), exporting those products, and importing the goods for which its opportunity costs are higher. According to this theory, specialisation and free trade are mutually beneficial to trade partners.

(2) In 2016, the simple average of the effective tariffs for all sorts of trading partners together was 2.9% for the United States, 2.5% for the EU, 3.5% for Japan and 7.9% for China (see chart 3). Excluding private trade agreements, the simple average of tariffs applied by the United States under the non-discrimination principle to the other members of the WTO (most-favoured nation tariff) was 3.5%, compared to 5.2% in the EU, 4% in Japan and 9.9% in China (WTO and UNCTAD). The United States on average applies exceptionally low non-discriminatory tariffs, which are only infrequently adjusted. They do however regularly take trade defence measures (anti-dumping measures, compensatory arrangements, safeguard measures, etc.) (Bown, 2017).

(3) The perception of a bias against the United States could chiefly be explained by the methodology used to calibrate the retaliatory measures in the framework of trade remedies, i.e. "zeroing" (for more information see Keynes and Bown, 2018). However, in practice, the WTO has ruled in favour of the United States in the large majority of its complaints (Lester and Manak, 2018).

(4) The US President has extended powers in the area of trade. He can fully autonomously, without approval from Congress, impose customs duties or quotas to restore payment imbalances, to punish a country that does not meet its international commercial obligations, or when imports threaten national security. The President has also broad powers to withdraw from, or renegotiate, an international agreement. For more details on the commercial powers of the US President, see Hufbauer and Jung (2016).



President to take measures if a country applies “unfair” commercial practices (Section 301 of the US Trade Act of 1974), to take safeguard measures if the import of a product threatens to injure domestic industries (Section 201 of the US Trade Act of 1974), and to restrict imports if they threaten national security (Section 232 of the Trade Expansion Act of 1962). It should be noted that, in the past, those laws have seldom, if at all, been invoked to justify tariff barriers<sup>(1)</sup> (Bown, 2017).

In general, a bilateral approach is favoured to make maximum use of the economic weight of the world’s largest economy in negotiations and to serve US interests as much as possible.

According to some (see, *inter alia*, Fisher, 2018) President Trump’s threats could form part of his negotiation tactics, directly inspired from his book on how to negotiate (“The Art of the Deal”) published in 1987. In that book, the winning strategy seems to consist of aiming very high, sowing confusion, showing indifference as to reaching an agreement and using all possible means at your disposal for your benefit. Behind the scenes and after escalating matters, he recommends moderating your position to obtain concessions and make decisions. This is how President Trump would seek to better serve American interests, but also to close deals.

### 3. America’s protectionist actions and retaliatory measures

Twenty months into his term of office, President Trump has not carried out the most extreme of his campaign threats. He has neither put customs duties on China up to 45 %, nor those on Mexico up to 35 % as threatened. Nor has he withdrawn the United States from NAFTA or the WTO, nor ‘officially’ labelled China as a currency-manipulating country. America’s 45<sup>th</sup> President has nevertheless clearly consolidated his protectionist stance with concrete actions and intimidation. These have fuelled trade tensions, which have occasionally turned into open conflict as trading partners affected have taken retaliatory measures. Below, we take a look at some of the main decisions.

#### 3.1 Withdrawal from and renegotiation of existing trade pacts

In keeping with his election campaign discourse, President Trump made clear soon after arriving at the White House on 20 January 2017 that the United States would be pulling out of the Trans-Pacific Partnership (TPP) that had been negotiated by his predecessor, Barack Obama, along with eleven Asia-Pacific countries. Furthermore, in August 2017, the new US Administration started a review of NAFTA with Canada and Mexico<sup>(2)</sup> and, in late March 2018, it wrapped up its renegotiation of the terms of the Free Trade Agreement between South Korea and the United States (KORUS).

#### 3.2 Washing machines and solar panels

In January 2018, import tariffs were slapped on \$ 8.5 billion worth of solar panels and \$ 1.8 billion worth of washing machines. These are safeguard measures adopted as a follow-up to an inquiry carried out in 2017 at the request of the US manufacturing sector. Of a temporary nature, they should give the domestic industry some breathing space, whilst it adjusts to international competition. The new customs tariffs have been set initially at 20 %<sup>(3)</sup> and are degressive over time.

These restrictions do not cover very large volumes, but the decision is symbolic in that it was the first time since 2001 that Section 201 of the 1974 Trade Act had been invoked for protectionist reasons<sup>(4)</sup>.

#### 3.3 Steel and aluminium

The US steel and aluminium sectors only account for a very small share of the United States’ trade deficit and its economic activity (see chart 6). They are nevertheless politically sensitive industries, whose employment and production are concentrated in a handful of “swing States” where election results are typically uncertain, and which consequently are given a lot of

(1) For example, Section 201 was last invoked in 2002, when the Bush Administration temporarily imposed customs duties on steel. The latest investigation based on Section 301 dates from 1995 and did not lead to any concrete measures at all. Finally, Section 232 has so far never been used within a trade dispute.

(2) The desire to renegotiate NAFTA is nothing new; the idea had already been put forward by Barack Obama and by Hillary Clinton during the 2008 presidential election campaign. According to Lester and Manak (2018), a new NAFTA should herald future relations between the United States and its other trading partners. At the end of August 2018, Donald Trump announced that a new trade agreement had been worked out with Mexico. Negotiations with Canada were still ongoing at the time of writing.

(3) The import tariff on washing machines was set at 20 % on the first 1.2 million units and 50 % on volumes above that. The import tariff on solar panels was initially set at 20 %.

(4) Subsequently, South Korea and China both started proceedings against the United States in the WTO, accusing these tariffs of violating international trade rules.

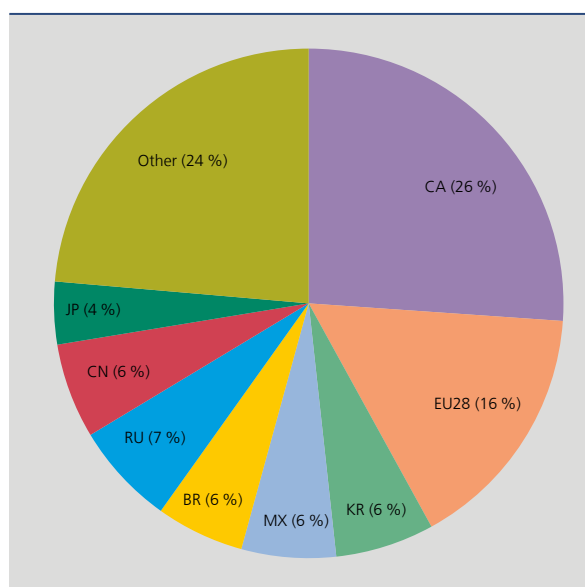
attention by presidential election candidates. Big steel-producing States like Ohio, Michigan and Pennsylvania, that had voted for Barack Obama back in 2012, helped Donald Trump on his road to victory in 2016. Historically, the US steel sector has frequently been protected and, at the end of 2017, 60 % of steel imports were subject to specific tariffs (Bown, 2018c).

Between 2000 and 2017, the US steel and aluminium industries registered a decline in employment and production, while imports were on the rise. Although the fall in the number of workers reflects to some extent the automation of production tools, these clear trends did not fail to fuel political debates and motivate these industries to seek protection.

Against this backdrop, in April 2017, President Trump launched two investigations to assess the threat to national security posed by imports of steel and aluminium. The conclusions, which were presented in February 2018, pointed out that the US steel and aluminium industries had fallen victim to “unfair” trade practices by other countries as well as to global over-production. It was recommended adopting protectionist measures in order to preserve “viable” sources of supply and guarantee “national security”.

So, on 1 March 2018, the United States announced that additional customs tariffs of respectively 25 and 10 % would apply, for an unspecified period of time, to US imports of steel and aluminium, which had totalled \$ 48 billion in value terms in 2017. Although all the United States’ trading partners had originally been targeted, various countries were given temporary exemptions, made conditional on their willingness to respond to the American trade concerns. This is the case for Canada, Mexico, Australia, the EU, Argentina, Brazil and South Korea. For all the other countries, the measures came into force on 23 March.

**CHART 4** ORIGIN OF US IMPORTS OF STEEL AND ALUMINIUM  
(in % of the total, 2017)



Source: Bown (2018a).

Taken into consideration that the trade talks with the EU were not going well, the US Administration stopped its exemptions with effect from 1 June 2018. Canada and Mexico also lost their privileges, which had been expressly made conditional on a favourable outcome to the NAFTA renegotiations. In the end, Brazil, Argentina and South Korea kept some exemptions, subject to certain restrictions. Australia is the only one to have been spared unconditionally. Although justified on national security grounds, the tariffs basically affect the United States’ traditional allies, the country’s main suppliers of steel and aluminium.

Most of the trading partners concerned have hit back with retaliatory measures targeting American products, good for a total of more than \$ 24 billion<sup>(1)</sup>. As early as April 2018, China<sup>(2)</sup>, whose exports of steel and aluminium were estimated at \$ 2.8 billion in 2017, imposed import tariffs ranging from 15 to 25 % on American products, with an export value of \$ 2.4 billion. In reaction to the € 6.4 billion (\$ 7.5 billion) of European exports affected, the EU has opted for “rebalancing measures”<sup>(3)</sup> on € 2.8 billion (\$ 3.2 billion) worth of US products that have been subject to customs duties of between 10 and 25 % since the end of June 2018. The list includes steel and aluminium products, agricultural products and various iconic US items (like Harley-Davidson motorbikes, jeans, bourbon, peanut butter, etc.)<sup>(4)</sup>. Canada, Mexico and Turkey have also taken retaliatory measures, affecting respectively \$ 12.8, 3.6 and 1.8 billion worth of US exports based on 2017 figures. Overall, the reactions have been proportionate and have targeted politically sensitive export products that are produced in States inclined to the Republican President’s camp<sup>(5)</sup>.

### 3.4 China

Economic ties between the United States and China have gradually strengthened since the end of the 1970s, but the real upswing came when China joined the WTO in 2001. Nowadays, the ‘Middle Kingdom’ is the United States’ main trading partner. It singlehandedly represents almost half of the country’s goods trade deficit (see chart 5).

Although the economic integration between the two countries is generally perceived as mutually beneficial, there is rising dissent in the United States as regards some of China’s policies, which are qualified as protectionist and damaging to US interests (Morrison, 2018). Among the oft-criticised “unfair” practices over the last few years are the artificial devaluation of the currency, forced technology transfer, theft of intellectual property, industrial subsidies, and State involvement in business. These objections are also shared by other countries: between 2006 and 2018 approximately 20 % of complaints submitted to the WTO related to China (Bown, 2018d).

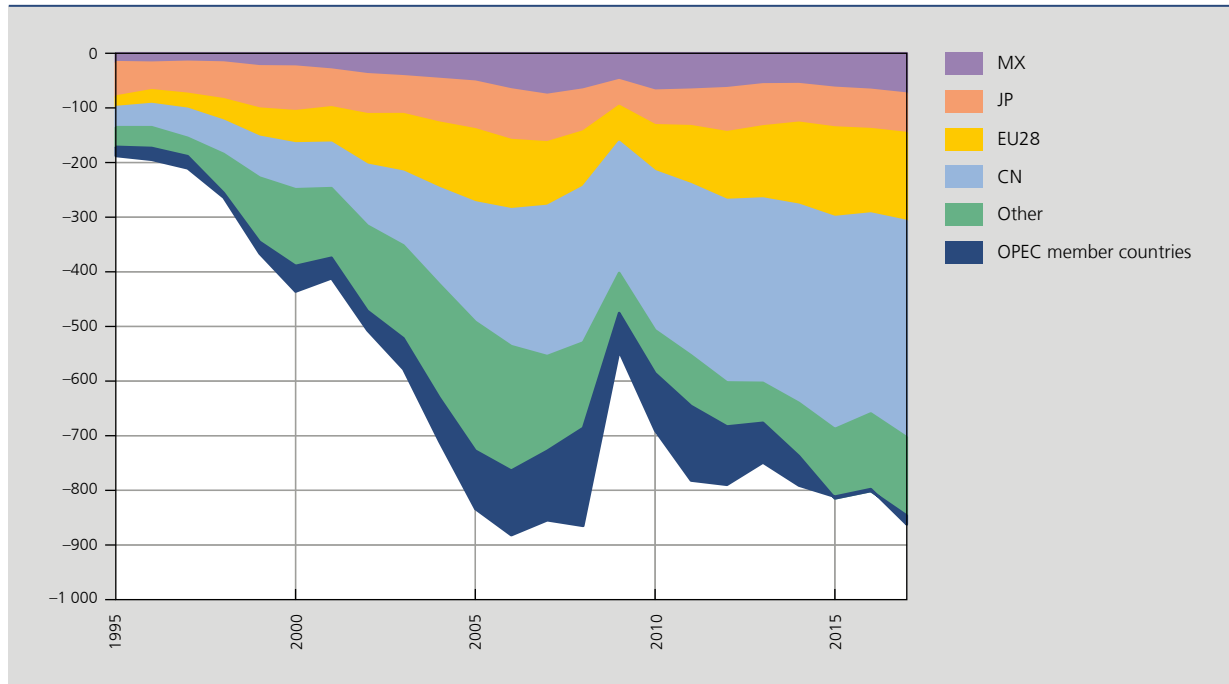
Despite regular bilateral dialogue in the mid-2000s between Washington and Beijing, recently it has proved impossible – despite many attempts at reconciliation – to reach a satisfactory agreement to resolve the economic and commercial conflicts between both countries. In this context, pleas for changes in China’s behaviour have received increasingly large support from the political and economic world on the other side of the Atlantic.

China has inevitably drawn the attention of the new US Administration, which is keen to reduce the trade deficit and safeguard fair trading conditions. As a result, in August 2017, President Trump ordered an investigation into China’s “unfair” practices in the areas of intellectual property and technology transfer. The report, published in March 2018, concluded that “China’s acts, policies and practices related to technology transfer, intellectual property, and innovation are unreasonable and discriminatory, and burden U.S. commerce” (USTR, 2017)<sup>(6) (7)</sup>.

Based on this, President Trump decided to impose a 25 % tariff on Chinese goods, for an amount representing \$ 50 billion worth of imports. The first tranche (\$ 34 billion) was introduced on 6 July 2018, whilst the tariffs for the second tranche (\$ 16 billion) were increased on 23 August. Close to 95 % of the imports in question are semi-finished products and industrial equipment. The hardest hit sectors include machinery, mechanical equipment and electrical equipment.

- (1) Under WTO rules, a member country is authorised to take retaliatory measures against another country’s trade practices when those practices have no legal basis. Compensation may then relate to no more than an amount corresponding to the value of lost exports. However, the WTO dispute settlement process can sometimes take several years, which forces member countries to get around it, by contesting the justification for the protective measures. In this context, a trading partner may request immediate compensation provided that its sales of the newly protected product have not increased in absolute terms. For more details, see Bown (2018a).
- (2) Although China produces half of the world’s steel and aluminium, it only accounted for 6 % of US imports in these sectors in 2017. More than 90 % of its products were in fact already subject to antidumping and countervailing duties, most of which were imposed before Donald Trump took office (Bown, 2018d).
- (3) The European Commission argues that the American decisions are tantamount to “disguised” safeguard measures and are not justified on national security grounds. It has therefore adopted a customs tariff on an amount equal to the export value of its products whose exported volumes had not increased between 2016 and 2017 (Bown, 2018b).
- (4) On 1 June 2018, the EU also initiated proceedings against the United States in the WTO, to contest US justification for customs tariffs. It also said it was reserving the right to impose additional rebalancing duties on €3.6 billion (\$4.3 billion) worth of US imports “in three years’ time or after a positive finding in WTO dispute settlement if that should come sooner” (EC, 2018).
- (5) In mid-July, the United States announced that they would launch WTO proceedings to contest the customs tariffs adopted in retaliation to their own measures on steel and aluminium.
- (6) Four types of practices were particularly scrutinised in the report: firstly, Chinese policies implicitly or explicitly oblige American companies that wish to enter the Chinese market to establish joint ventures with Chinese companies and transfer their technology to them. Secondly, Chinese laws and regulations oblige American companies that wish to sell their technology in China to cede their licences at prices lower than their economic value. Thirdly, the Chinese government’s industrial policy includes an investment plan that encourages the purchase of sensitive American technology. Fourthly, the Chinese government supports cyber intrusions into American companies to fish for commercial secrets and other confidential information.
- (7) In addition to their differences regarding intellectual property, Washington is apparently also concerned about the rise of Beijing. The Made in China 2025 plan to promote the manufacturing industry and the Belt and Road Initiative to boost connections between China and the rest of the world are also perceived as threats to the United States’ economic, technological and financial hegemony.

**CHART 5** GEOGRAPHIC DISTRIBUTION OF US TRADE DEFICIT  
(in \$ billion, goods, 1995-2017)



Source: UNCTAD.

In line with its tit-for-tat strategy, China approved an identical 25% tariff on the same day for equivalent amounts on American goods. Contrary to the US measures, the Chinese tariffs were chiefly directed at consumer goods, and especially agricultural and transport-related products.

Against a backdrop of retaliatory action by Beijing, the US President asked the Trade Representative to identify Chinese products for a value of \$ 200 billion on which additional tariffs could be applied. Tariffs of 10% and then 25% were cited. China reacted by threatening a new tariff hike of 5% to 25% on \$ 60 billion of American imports. President Trump revealed that in the event of further retaliatory actions, he could increase the value of the affected products to \$ 400 billion, and even impose new tariffs on all Chinese products<sup>(1)</sup>.

In mid-September 2018, the American government formally approved the introduction of additional duties on a new list of 5 745 Chinese products, with an import value of approximately \$ 200 billion. The tariff was initially established at 10%, to be applied from 24 September 2018 onwards. If no agreement is reached, these tariffs are set to increase to 25% starting from 1 January 2019. In response, China announced that it would go ahead with its retaliatory actions.

### 3.5 Threats to the automotive sector

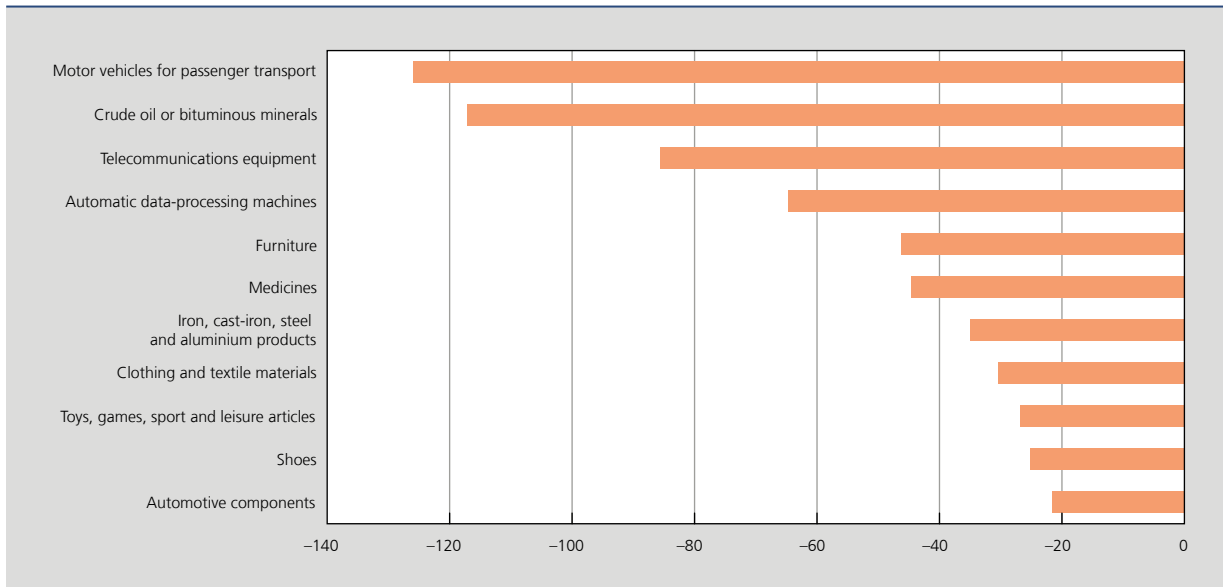
The automotive industry is from a sector-specific point of view what China is from a geographical point of view: the primary source of the US trade deficit. Since the 1970s, this sector has seen a trade deficit in the United States, which has greatly compounded over the past decade. In 2017, the deficit for the sector as a whole reached \$ 165 billion, \$ 125 billion of which was for motor vehicles destined for passenger transport (see chart 6). The Trump Administration additionally considers that US vehicle exports to China and the EU are disadvantaged by higher tariffs than those imposed by the US<sup>(2)</sup>.

(1) Apart from the tariff measures, in March 2018, the United States also commenced proceedings against China before the WTO for discriminatory practices with respect to licence transfers. They equally took specific measures to restrict Chinese investment in some industries and technologies deemed essential by the United States. After trade talks between the United States and China were suspended in June 2018, they were resumed at the end of August.

(2) Customs duties on private vehicles are 10% in the EU and 2.5% in the United States. However, since 1964, the tariff on light-duty trucks and commercial vehicles in the United States is 25% compared to 22% in the EU. In May 2018, China agreed to lower its tariffs from 25% to 15%, taking effect from July 2018.

As a reaction to the retaliatory measures for the steel and aluminium tariffs, President Trump threatened to put up tariffs on imports of vehicles to the United States, with this specifically targeting the EU.

**CHART 6** MAIN PRODUCTS THAT CONTRIBUTE TO THE US TRADE DEFICIT  
(in \$ billion, 2017)



Source: UNCTAD.

Against this backdrop, on 23 May 2018, the US Department of Commerce launched an investigation into the national security implications of imports of vehicles, SUVs, vans, light-duty trucks and spare parts. This probe could culminate in customs duties of approximately 20% to 25% on a total import value of about \$ 300 billion in 2017.

That decision was immediately condemned, not only by the main exporting countries (Mexico, Canada, Germany, South Korea and Japan), but also by manufacturers based in the United States. The latter considerably benefit from the integration of their production into global value chains and are concerned both about a rise in prices for semi-finished products and potential retaliatory measures from trading partners of the US. The EU and Canada already announced that they would react proportionately to the new customs duties.

Fears of an increase in customs duties to the detriment of the automotive sector somewhat ebbed in the summer of 2018, following the favourable progress of various trade talks. On 25 July, the United States and the EU announced that they had reached an agreement to intensify trade cooperation<sup>(1)</sup>. They agreed not to introduce any new customs duties whilst talks were underway and stated that a solution would be sought to their differences as regards steel and aluminium tariffs.

At the end of August, President Trump announced that a deal had been reached with Mexico to revise NAFTA. Although talks with Canada were still ongoing at the moment of writing, that agreement augurs well for a conciliation of trade relations in North America.

(1) The EU and the United States plan to work together towards ending tariff and non-tariff barriers as well as subsidies of non-automotive industrial goods. They additionally plan to work towards intensifying trade in services, chemicals, pharmaceuticals, medical products and soya. They have also agreed on strategic bilateral cooperation with respect to energy. Finally, at an international level, they decided it was necessary to address unfair trade practices and reform the WTO. Contrary to the TTIP (for which negotiations – which have in the meantime reached a deadlock – started back in 2013), this agreement is limited to industry, leaving out the far more sensitive sectors such as agriculture and services. Equally, it does not encompass investment matters. Somewhat paradoxically, the automotive sector is also excluded as it is the subject of separate negotiations. At the end of August 2018, the European Commissioner for Trade, Cecilia Malmström, said that the EU was prepared to agree to zero car tariffs on the condition that the United States would do the same, but her request was rejected by the US President.

## Box 2 – What are the economic effects of trade disputes ?

In the 1930s, in the midst of the economic depression, the Smoot-Hawley Tariff enacted by US Congress led to a rise in customs duties of an average of approximately 8 percentage points on almost 900 products imported into the United States<sup>(1)</sup>. US trading partners did not take kindly to these decisions, and reprisals abounded. The trade war that followed led to an almost 40 % fall in global trade volumes between 1930 and 1932 (Grossman and Meissner, 2010).

Today's scenario is a completely different one. The global economy is doing well overall, average customs duties are considerably lower today, and international economic, financial and commercial relations have nothing in common with those that existed in the 1930s. The channels through which a wave of protectionism can influence trade and the global economy are more numerous and diffuse than ever, which only makes the question of its economic impact even more relevant.

### *Limited macroeconomic impact*

The protectionist measures taken in 2018, albeit unprecedented, only cover a minor part of international trade. Outside the safeguard measures, they relate to approximately \$ 432 billion in manufacturing exports, taxed at 5 % to 25 %. That represents less than 3 % of international trade. It should be emphasised that imposing tariffs does not necessarily lead to the extinction of these trade flows but rather to a contraction of them. The so far adopted tariff measures therefore have a limited macroeconomic scope.

Even if the threats already made were actually carried out, they would affect approximately 8 % of global trade. Many companies could nevertheless try to work through intermediaries, change trade routes or reorganise production geographically to circumvent the customs duties.

According to macroeconomic models, economic impact would remain limited, even if an extended trade war would lead to a tariff rise for the import of all goods between the United States and its main trading partners. According to Bollen and Rojas-Romagosa (2018), such a scenario of a blanket tariff increase of 15 % would not shrink global trade by any more than 11 % to 12 % or lead to a decline of any more than 2.5 % in global GDP between now and 2030. According to Krugman (2018), customs tariffs of 30 % to 60 % could make international trade fall by 70 % but the cost to the world's economy would not be more than 2 % to 3 % of GDP.

In light of an estimated 3.9 % growth in global GDP for 2018 and 2019 (IMF, 2018), the overall effects of a genuine trade war seem to remain relatively limited. That scenario may appear utopic though. Its rather reassuring elements need to be nuanced and clarified on various points.

### *The costs of protectionism are not evenly distributed*

Just like the advent of globalisation, its opposite – deglobalisation – has its winners and losers. The ones that stand to lose the most are the sectors and countries directly hit by the tariff barriers. The sharp fall in German car manufacturers' share prices immediately after the US President's threats is revelatory in this respect. On a more general level, export industries already firmly entrenched in the global value chains are more likely to lose, while industries that are competing with imports are more likely to win.

The US steel and aluminium sectors have benefited the most from the recent measures, which have caused a huge increase in prices for these metals. On the other hand, the industries that rely heavily on steel and aluminium, for example manufacturing of cans or canned goods, have suffered. The same goes for US soya producers, whose

(1) At the time, the tariffs were specific, i.e. per unit of product, which led to a sharp *ad valorem* increase in the context of the Great Depression, a period characterised by deflation.



exports have been affected by retaliatory measures from China. US car makers are an interesting case, in the sense that they could be disadvantaged by a tariff hike for the import of vehicles insofar as they manufacture a great deal of the vehicles sold in the US abroad. They are already suffering under the strain of the measures for steel and aluminium, and duties on car parts would only add to this. Finally, one could say that the EU may stand to gain if a full-blown US-China trade war flares up<sup>(1)</sup>. After all, this situation could open up opportunities for some European sectors to the detriment of their American counterparts, for example in aviation.

### ***Reorganising production is expensive and time-consuming***

To reorganise global manufacturing, resources need to be overhauled. New factories need to be created, whilst others need to be taken down as they are no longer profitable or useful. This entails fixed costs that do not necessarily contribute to more growth and that can put pressure on productive investments. New trade barriers also force some companies to establish new trade relations, or look for new suppliers and sales markets, which takes time.

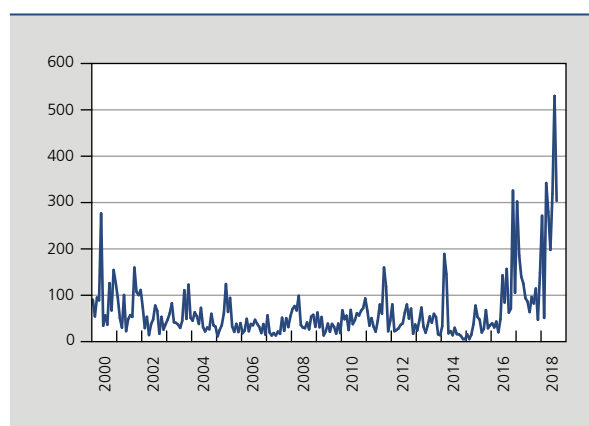
As a reaction to the European retaliatory measures, US company Harley Davidson revealed that it would move part of its manufacturing activity to factories outside the United States to circumvent the new European 25% tariffs on motorbikes imported from the United States. It indicated that this plan requires new investments and could take up to 18 months.

### ***A protectionist climate is a source of uncertainty***

Apart from the measures that are actually implemented, a protectionist climate creates uncertainty, which is difficult to take into account in macroeconomic models. That uncertainty has implications for consumer confidence and causes companies to suspend their investment and recruitment plans, or even to cancel them. At a meeting in June 2018, the US Federal Reserve's Federal Open Market Committee specifically raised the issue of signals going in such direction in the United States (FOMC, 2018). More generally, uncertainty risks contributing to risk aversion. It therefore also weighs on economic activity through tightening financial conditions.

#### **UNCERTAINTY ABOUT US TRADE POLICY**

(index<sup>(1)</sup>, January 2000-August 2018)



Sources: Policy Uncertainty. Baker, Bloom and Davis (2016).

(1) Number of articles in US newspapers discussing uncertainty regarding trade policy.

(1) Bollen and Rojas-Romagosa (2018) demonstrate that the EU could reap some benefits from a trade war between the United States and China.



The protectionist measures that have been introduced, just like the retaliatory measures in reaction thereto, appear to be in contrast with the rules of international trade, and certainly go against the spirit of those rules. In the event of an escalation, there is a risk that the commercial system based on shared rules, which precisely contributes to stability, could come under discussion. Reiterated threats from President Trump that he will withdraw the United States from the WTO only add to these fears. Such a decision could mean an end to the post-war international trade system as we know it and could have much greater consequences than the duties and tariff threats that are currently on the table.

More broadly, taking into account the geopolitical role of trade and the current course of US foreign policy, the future of international relations and of the world order could be rightly called into question.

#### ***Tariffs support inflation***

Tariffs drive some prices up: the rise in aluminium prices is reflected in the price of cans, which in turn affects the price of the drinks in these cans. That additional inflation could end up affecting consumer confidence as well as consumption. Low-income individuals would be the most severely hit as they usually allocate a larger proportion of their income to the products that have reduced in cost the most thanks to free trade.

If inflation is sufficiently stimulated, monetary policy could moreover become more restrictive than it is in the absence of tariffs, which would drag down economic activity. According to Carney (2018), an all-out trade war could accelerate inflation in the United States by approximately 1 %.

#### ***Deglobalisation is a threat to productivity***

Just as specialisation and economies of scale boost productivity, any disintegration of world trade would stall productivity growth over the longer term, not least because of reduced competition and a slower spread of new technology. According to some estimates, a 20 % fall in trade could push down productivity over the long term by 5 % (Carney, 2018).

## 4. What is the impact on Belgium ?

To estimate an economy's degree of exposure to the imposition of international trade barriers, export and import data are typically used. In the case in hand, these statistics are of particular interest, to the extent that they are used by the US Administration to make its diagnosis and thus serve as a barometer for its decision-making.

Trade data nevertheless have their limitations (see box 1). Nowadays, exports are in fact largely disconnected from the income they generate. For sourcing their export production, firms frequently rely on foreign inputs, whether they be raw materials, components or specific services. This imported content rewards foreign factors of production, breaking the equivalence between the amounts exported and the revenue earned for a country. If, in order to export 100, it is first necessary to import 40, the income generated comes to 60. This figure corresponds to the value added invested in exports. It measures the business activity undertaken, and thus the jobs created.

The fragmentation of production chains at the global level is now a well-established economic fact (see, *inter alia*, Elms and Low, 2013). It is increasingly frequent for the same product to cross several borders and go through various stages of processing along its way. For our risk analysis elaborated in section 4.2, we prefer to use the value-added approach. Although it does have some weaknesses, notably in terms of timeliness of the data (see box 1),



this approach is the most appropriate for attaining our objective of assessing as precisely as possible an economy's exposure to its trading partners<sup>(1)</sup>.

Barriers to trade primarily affect exporting firms. They also have ripple effects. When exporters sell less, they cut back their purchases from their suppliers. The latter therefore suffer too and, in turn, also buy less, and so on. The strength of the value added analysis lies precisely in the fact that it considers the entire production chain, taking account of all content that is successively accumulated throughout the chain. It therefore includes the contribution of each Belgian firm involved in the production of exported goods and services.

#### 4.1 Extent of trade with the United States

Over the period running from 2015 to 2017, almost 4 900 Belgian firms exported goods directly to the United States worth around € 14 billion on average each year, making the US Belgium's fifth main trading partner, after Germany, France, the Netherlands and the United Kingdom. Featuring high on the list of products exported across the Atlantic are mainly chemicals and pharmaceuticals products (€ 7.2 billion), machinery (€ 2 billion) and transport equipment (€ 1 billion). Exports of steel and aluminium, directly targeted by the Trump Administration's recent protectionist measures, amounted to respectively € 150 and 60 million.

Over the same period, 16 800 Belgian firms<sup>(2)</sup> bought a total of € 13.3 billion worth of American goods a year. These imports mainly consisted of chemicals and pharmaceuticals products (€ 5.5 billion), machinery (€ 2.6 billion) and instruments (€ 1.7 billion), particularly medical and orthopaedic instruments.

Trade in services between the two countries is also significant. Belgian exports to the United States reached € 10.3 billion, compared with € 7.6 billion of imports. Services trade, in both directions, basically concerns services that fall in the "other business services" category, notably including consultancy and research and development services provided on behalf of parent companies or subsidiaries within a multinational group.

**TABLE 1** TRADE IN GOODS AND SERVICES BETWEEN BELGIUM AND THE UNITED STATES  
(in € billion, average for 2015-2017)

	Belgian exports to the United States (X)	Belgian imports from the United States (M)	Bilateral trade balance (X-M)
Goods (B) .....	14.0	13.3	0.7
<i>Number of firms</i> .....	4 900 <sup>(1)</sup>	16 800 <sup>(1)</sup>	
of which: steel .....	0.15		
<i>Number of firms</i> .....	90 <sup>(1)</sup>		
of which: aluminium .....	0.06		
<i>Number of firms</i> .....	180 <sup>(1)</sup>		
Services (S) .....	10.3	7.6	2.8
<b>Total (B+S) .....</b>	<b>24.3</b>	<b>20.8</b>	<b>3.5</b>

Sources: NAI (external trade data according to the national concept) and NBB (balance of payments).

(1) Rounded off to the nearest ten.

Note: For rounding-off reasons, the totals may not correspond to the sum of the components.

(1) See also Vandenbussche *et al.*, 2017, who use the same approach for measuring the impact on Belgian jobs of tariffs of respectively 5 and 15 % on US imports.

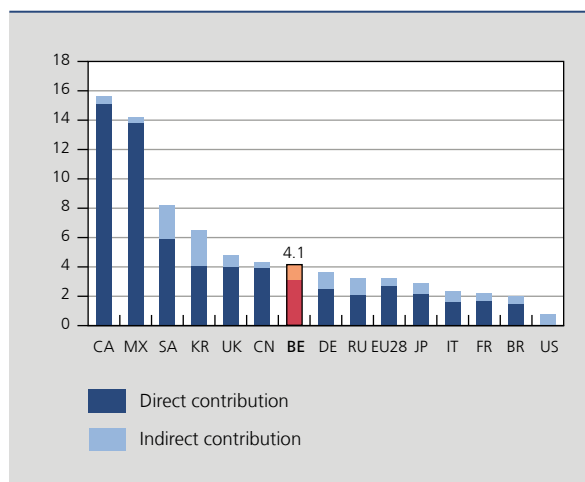
(2) The difference between the number of importers and the number of exporters seems to be specific to Belgium, owing to its role as gateway to the European market.

## 4.2 Risk analysis for Belgium

Out of the total US imports of goods and services, Belgium's value added at stake came to around 4.1 % of the country's GDP over the period 2009-2011<sup>(1)</sup>. This percentage is below that of the United States' traditional trading partners like Canada, Mexico or the United Kingdom, but it turns out to be relatively high when compared with other European countries, notably Germany or France.

**CHART 7** CONTRIBUTION TO US IMPORTS

(in % of GDP<sup>(1)</sup> of the country in question, average 2009-2011)



Source: Own calculations based on TiVA data.

(1) Net of taxes less subsidies on products.

This percentage of 4.1 % is made up of the total of all contributions from Belgian firms to US imports. It of course includes the value added involved in direct exports from Belgium to the United States, which came to 3.1 % of GDP<sup>(2)</sup>. It also contains the indirect Belgian contribution to US imports, which represented about 1 % of GDP<sup>(3)</sup>. Some Belgian firms produce components, or even provide specialised services, that go into the manufacturing of foreign products intended for the US market. A case in point would be spare parts made in Belgium and integrated into the assembly chains for German cars exported to the United States.

However, the degree of exposure does not give a precise idea of the Belgian economy's sensitivity to a shock like the imposition of a new customs tariff. To do this, it is necessary to have a model consisting of a whole range of selected mechanisms. In real terms, it is a question of determining, with the help of parameters, the vulnerability of the production chains' structure to this shock. We have carried out simulations on the basis of a model derived from Tintelnot *et al.* (2018)<sup>(4)</sup>. This in turn is based on individual firms and integrates all trading relations that they have with each other. It therefore takes into consideration not only the direct effects on firms that have trade relations with the United States, but also the indirect effects on their chain of Belgian suppliers and customers. Moreover, this general equilibrium model estimates the decline in income recorded in the companies concerned, and it reduces the economy's total final demand correspondingly. So, even a firm that has no direct or indirect connection with the United States is affected when demand for its products from workers who have been hit by the shock decreases.

(1) In this article, we always refer to a GDP net of taxes less subsidies on products. For the record, this concept is the equivalent of total value added, which in Belgium was worth €339.6 billion in 2011. By adding taxes less subsidies on products, which came to €39.5 billion in 2011, it makes up GDP, which therefore amounted to €379.1 billion in 2011.

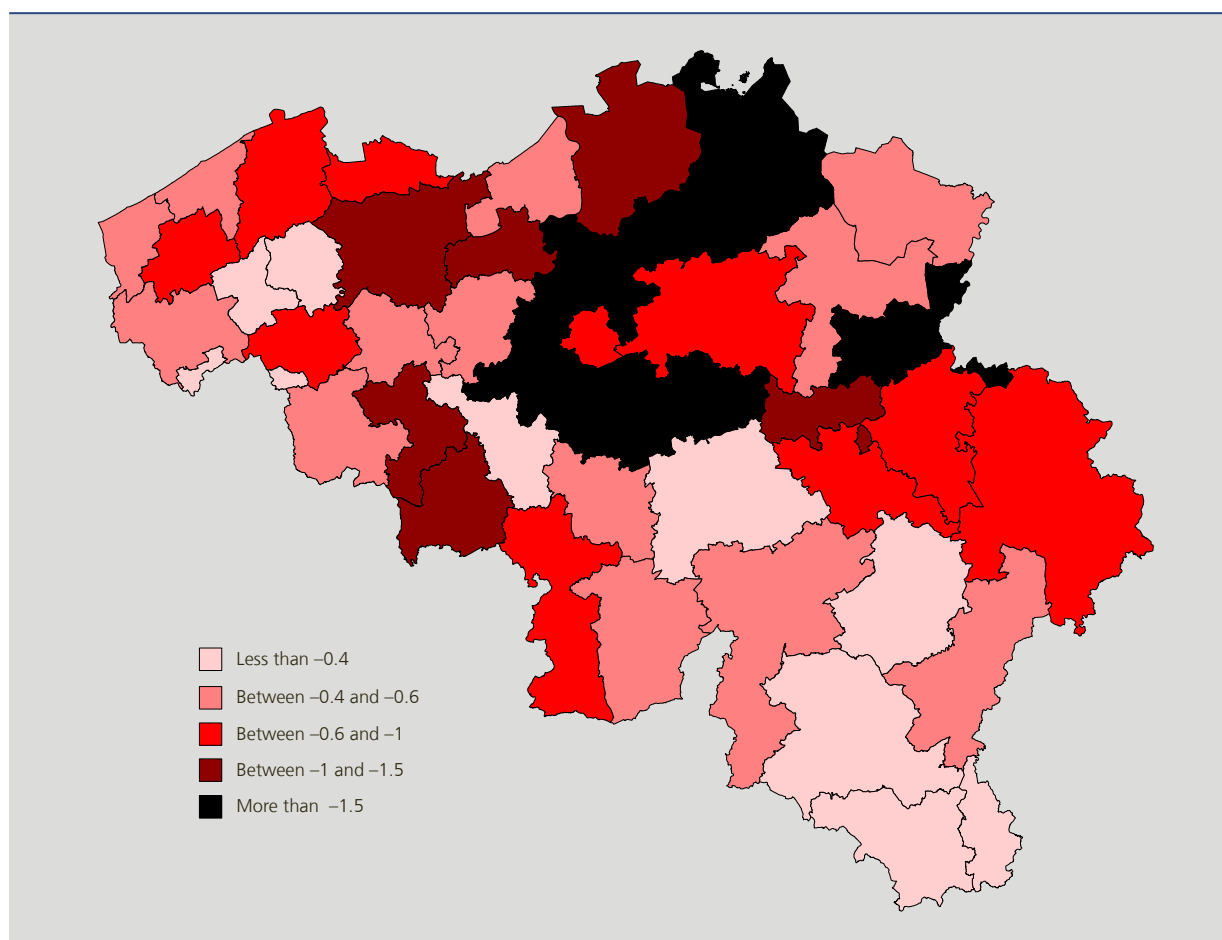
(2) This figure gives the total of all contributions from Belgian exporters to the US and those of their entire chain of Belgian suppliers.

(3) This figure gives the total of all contributions from Belgian exporters to foreign firms that export to the US and those of their entire chain of Belgian suppliers.

(4) It should be noted that the simulation does not take account of the indirect effects that filter in through third countries, and especially the fall in demand from trading partner countries following the imposition of a customs tariff.

**CHART 8** MAP OF THE SIMULATED EFFECTS OF A RECIPROCAL TARIFF OF 10%<sup>(1)</sup> ON TRADE BETWEEN BELGIUM AND THE UNITED STATES

(percentage changes in private sector value added, reference year = 2012)



Source: Own calculations derived from Tintelnot *et al.* (2018).

(1) Applied uniformly to all products, with the exception of steel, for which a customs tariff of 25% on exports from Belgium has been applied to comply with the measure currently in force.

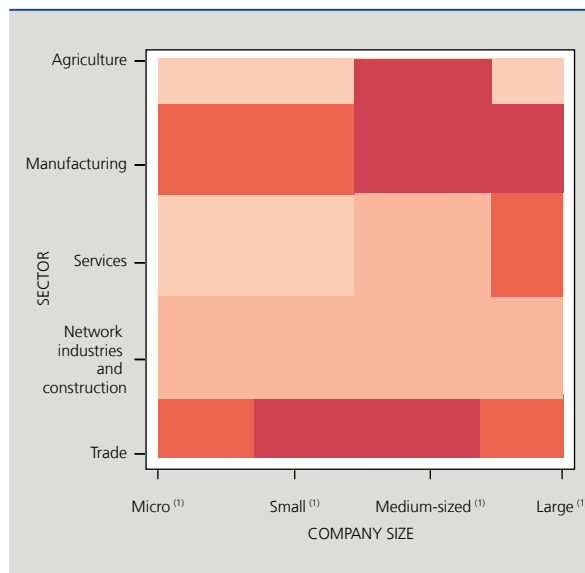
Chart 8 maps out the estimated effects of a 10% tariff on Belgian exports to the United States and on Belgian imports from the United States. Among the most sensitive geographical areas are the districts of Antwerp, Ath, Ghent, Hal-Vilvorde, Mechelen, Mons, Nivelles, Dendermonde, Tongeren, Turnhout and Waremme. The aggregate impact on the Belgian economy is estimated at -1.0% of value added.

It should be noted, however, that firms within the same district are not all exposed in the same way. Generally speaking, large manufacturing firms and wholesale and retail trade firms would appear to be the most vulnerable. Big services, agriculture and network companies are also believed to be affected, albeit to a lesser extent. These findings point up the interconnection of firms among each other. Barriers to international trade do not just hit exporters or importers, mostly industrial companies who are on the front line, but also affect whole swathes of the Belgian production network.

These initial findings provide a global risk analysis triggered by barriers to trade with the United States. However, the US Administration has actually targeted specific products or countries of origin. So, this article will now turn to these production chains, in particular, steel and aluminium, US-China trade, and the automotive industry.

**CHART 9** SIMULATED EFFECTS OF A RECIPROCAL TARIFF OF 10 % <sup>(1)</sup> ON TRADE BETWEEN BELGIUM AND THE UNITED STATES: BREAKDOWN BY MAJOR SECTOR AND COMPANY SIZE

(percentage changes in value added, reference year = 2012)



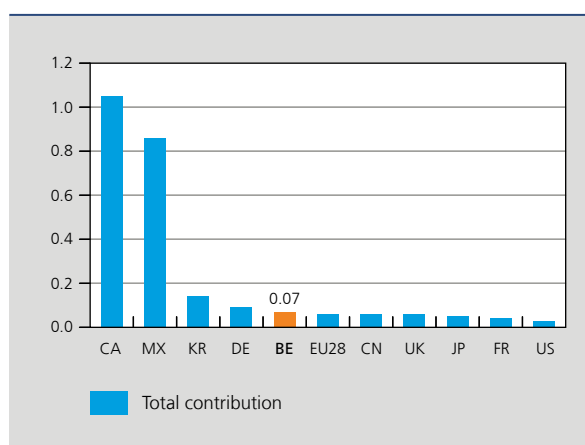
Source: Own calculations derived from Tintelnot *et al.* (2018).

(1) Applied uniformly to all products, with the exception of steel, for which a customs tariff of 25 % on exports from Belgium has been applied to comply with the measure currently in force.

Note: Firms are classified by size: micro-companies (less than 10 employees), small firms (between 10 and 49 employees), medium-sized enterprises (between 50 and 249 employees) and large enterprises (more than 250 employees).

**CHART 10** CONTRIBUTION TO US IMPORTS OF BASE METALS

(in % of GDP <sup>(1)</sup> of the country in question, average 2009-2011)



Source: Own calculations based on TiVA data.

(1) Net of taxes less subsidies on products.

Note: The figures given include direct and indirect contributions. It should be pointed out that, in the case of base metals, contributions are mostly direct.

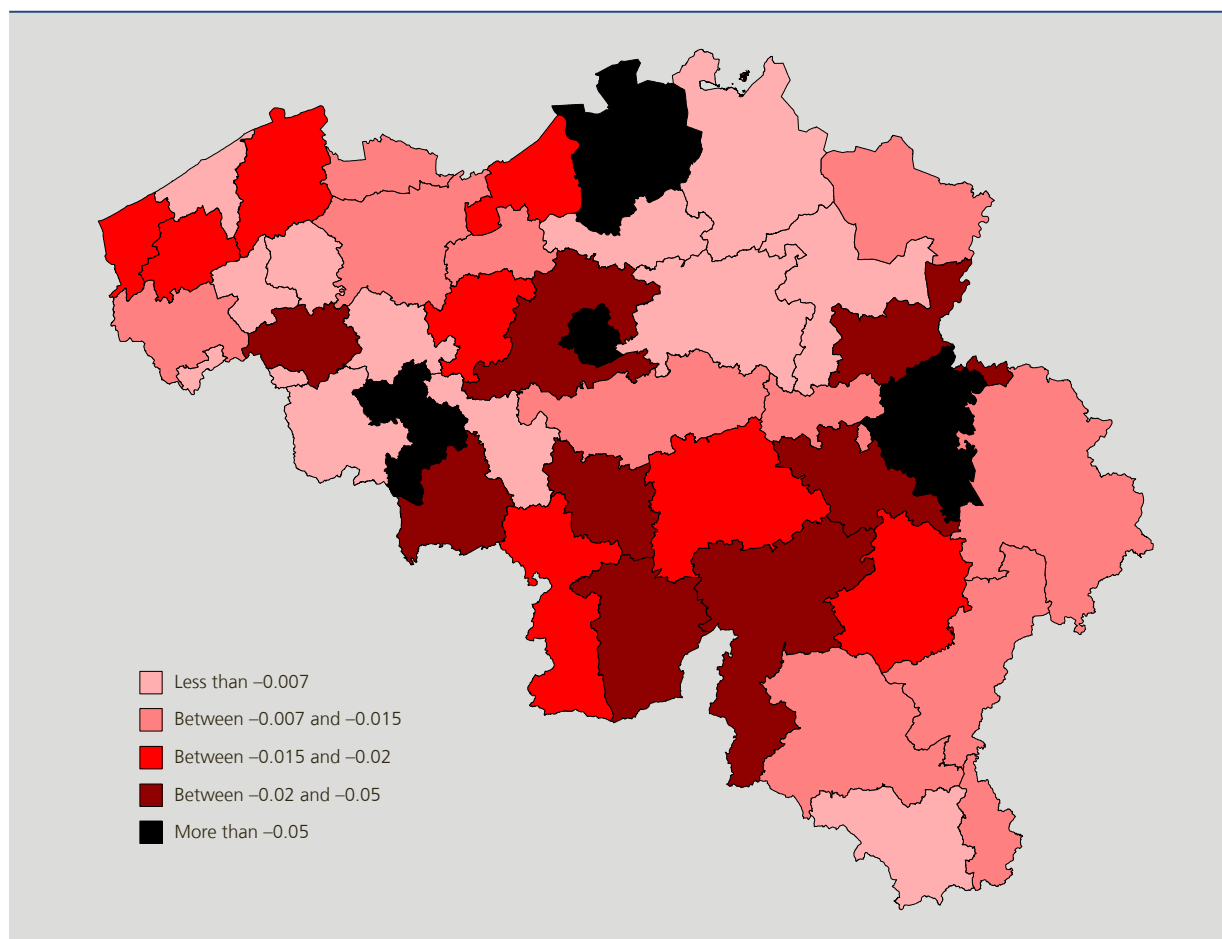
## Steel and aluminium

Belgian value added involved in US imports of base metals accounted for around 0.07 % of Belgium's GDP over the period 2009-2011. Yet, steel and aluminium make up roughly half of all Belgian exports of base metals to the United States, which also cover copper, nickel, zinc, etc. So, there is a smaller degree of exposure specifically to steel and aluminium. At the end of the day, while the negative impact of a customs duty on the steel and aluminium sectors should not be underestimated, it must be concluded that the macroeconomic effect of these trade barriers is very limited.

According to our simulation exercise, the geographical areas most sensitive to the customs duties of 25 % on steel and 10 % on aluminium are the districts of Antwerp, Ath, Brussels, Charleroi, Kortrijk, Dinant, Hal-Vilvorde, Huy, Liège, Mons, Philippeville and Tongeren (see chart 11). The aggregate impact on the Belgian economy is estimated at -0.04 % of value added.

**CHART 11** MAP OF THE SIMULATED EFFECTS OF CUSTOMS DUTIES OF 25 % ON STEEL AND 10 % ON ALUMINIUM ON BELGIAN EXPORTS TO THE UNITED STATES

(percentage changes in private sector value added, reference year = 2012)



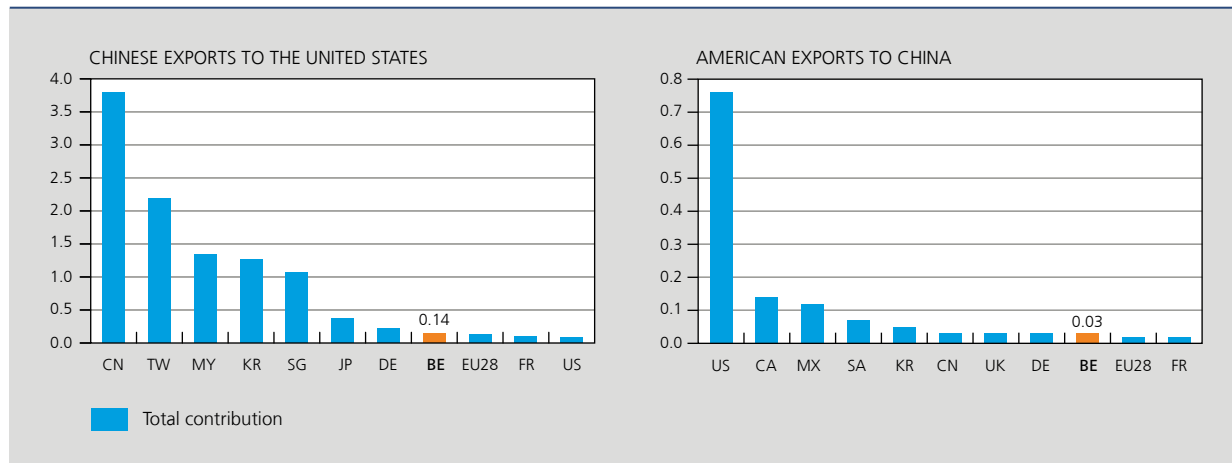
Source: Own calculations derived from Tintelnot *et al.* (2018).

## Sino-American trade

As a supplier of China and the United States, Belgium is indirectly involved in commercial transactions between these two countries. It contributed to Chinese exports to the United States to the tune of 0.14 % of GDP over the period 2009-2011. It should be noted that this contribution is partly indirect, for instance when Belgium exports components to a partner supplier to China. It is more specifically involved in Chinese sales of (electrical, IT and optical) equipment destined for the American market.

When it comes to American exports to China, the Belgian contribution mainly involves chemical and pharmaceutical products. On the whole, the contribution is very low, barely reaching 0.03 % of GDP. Belgium is therefore five times less exposed to US exports to China than it is to Chinese sales to the United States. This is a rather surprising finding since Belgium is known to export more to the United States than to China<sup>(1)</sup>.

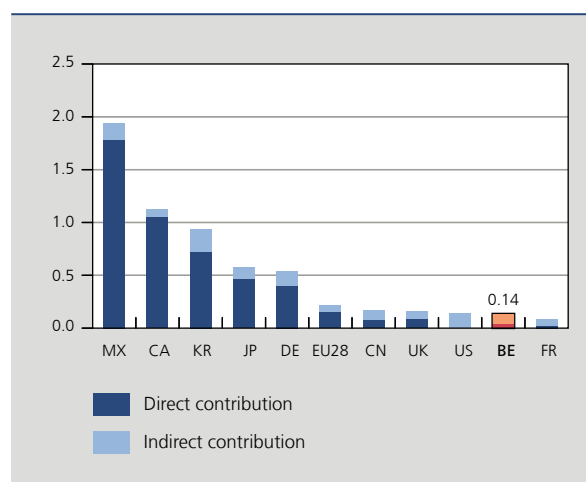
**CHART 12** CONTRIBUTION TO TRADE BETWEEN CHINA AND THE UNITED STATES  
(in % of GDP<sup>(1)</sup> of the country in question, average 2009-2011)



Source: Own calculations based on TiVA data.  
(1) Net of taxes less subsidies on products.

Note: The figures given for all third countries refer exclusively to indirect contributions. For China in the case of Chinese exports to the United States (left-hand chart) and for the US in the case of American exports to China (right-hand chart), the figures are of course exclusively direct contributions.

**CHART 13** CONTRIBUTION TO US IMPORTS OF MOTOR VEHICLES  
(in % of GDP<sup>(1)</sup> of the country in question, average 2009-2011)



Source: Own calculations based on TiVA data.  
(1) Net of taxes less subsidies on products.

(1) This is the case when exports are expressed as gross flows or in value added.

How can this apparent paradox be explained? The answer lies in the extent to which foreign inputs are used in production intended for export. American imports count for little in production for export. They are more geared towards domestic consumption and investment. By contrast, China is typically an intermediate link in global value chains and its imports contribute intensively to its production for export. In comparison to the United States' suppliers, China's are therefore more exposed to the export sectors<sup>(1)</sup>.

### **Automotive industry**

Belgian value added involved in US imports of motor vehicles, trailers and semi-trailers accounted for about 0.14 % of Belgium's GDP over 2009-2011. This contribution is largely indirect, as it penetrates the US domestic market through imports of cars originally made in Germany and, to a lesser extent, in Asian countries.

## Conclusion

America's new trade policy is totally in line with the campaign promises made by President Trump. It is widely supported by Republican voters as being in "America's best interests", in accordance with the now famous foreign policy slogan "America first". The Trump Administration's clear mistrust of the WTO and multilateralism in general bears witness to the importance it accords to national sovereignty and reflects its desire to make full use of the weight of the United States in international negotiations. Diverse though they are, the trade measures adopted largely focus on the same objective: promoting activity and employment in the United States. That applies to the stated intention to renegotiate the North American Free Trade Agreement, the increase in customs duties on steel and aluminium, and the tariff barriers imposed on Chinese products.

In this article, it is shown that the impact on the Belgian economy of these measures is fairly small. For example, the Belgian value added involved in American imports of base metals – which include steel and aluminium – amounts to just 0.07 % of Belgian GDP. However, the adverse impact on the sectors concerned and their supply chains should not be underestimated. The simulation exercise conducted in this article shows that Antwerp, Ath, Brussels, Charleroi, Kortrijk, Dinant, Hal-Vilvorde, Huy, Liège, Mons, Philippeville and Tongeren are the most vulnerable districts.

The article furthermore reveals that Belgium's exposure to Chinese sales on the American market is almost five times greater than the other way around, even though Belgian exports to China are significantly lower than its exports to the United States. This apparent paradox reflects the weight of Chinese exports to the United States in comparison with the opposite flows. It also reflects fundamental differences in the contribution of foreign inputs to the production and exports of those two countries. American imports play little part in export production, being destined more for domestic consumption and investment. Conversely, China is typically an intermediate link in global value chains, and its imports make a major contribution to its exports.

Although they are unprecedented, the tariff barriers erected so far by the Trump Administration and the reprisals by US trading partners account for only a fraction of world trade and are of limited macroeconomic importance overall. However, attention should be drawn to their inevitable redistributive effects, their costs in terms of the reorganisation of production and increased uncertainty, as well as their negative influence on productivity over the longer term. If the current threats concerning all Chinese exports and the automotive industry are carried out, possibly followed by escalating protectionism, that will have more damaging effects for the global economy.

(1) We did not carry out any simulation on this subject. Such a scenario would effectively mean determining all Belgian firms and products that are indirectly affected by the Sino-American trade barriers, which is a particularly difficult exercise.

## Bibliography

- Acemoglu D., D. Autor, D. Dorn, G.H. Hanson et B. Price (2016), *Import Competition and the Great US Employment Sag of the 2000s*, *Journal of Labor Economics*, 34(1), January.
- Ahmad N. (2013), "Measuring trade in value-added, and beyond", prepared for the Conference on "Measuring the Effects of Globalization", *OECD*, Paris.
- Baker S.R., N. Bloom and S.J. Davis (2016), "Measuring Economic Policy Uncertainty", *Quarterly Journal of Economics*, November, 1593-1636.
- Baldwin R. and J. Lopez-Gonzales (2013), *Supply-chain trade: a portrait of global patterns and several testable hypotheses*, NBER, Working Paper 18957, April.
- Bollen J. and H. Rojas-Romagosa (2018), "Trade Wars: Economic impacts of US tariff increases and retaliations – An international perspective", Netherlands Bureau for Economic Policy Analysis – CPB, July.
- Bown C. (2017), "Steel, aluminum, lumber, solar: Trump's stealth trade protection", *Peterson Institute for International Economics, policy brief*, 17-21, June.
- Bown C. (2018a), "Trump's Steel and Aluminum Tariffs: How WTO Retaliation Typically Works", *Peterson Institute for International Economics*, March 5.
- Bown C. (2018b), "Europe Is Pushing Back against Trump's Steel and Aluminum Tariffs. Here's How", *Peterson Institute for International Economics, PIIE op-eds*, March 9.
- Bown C. (2018c), "US Steel Is Already Highly Protected from Imports", *Peterson Institute for International Economics, charts*, March 15.
- Bown C. (2018d), "The accumulating self-inflicted wounds from Trump's unilateral trade policy", in "US-China Economic Relations: From Conflict to Solutions – Part I", *Peterson Institute for International Economics, PIIE Briefing 18-1*, 7-21, June.
- Carney M. (2018), *From protectionism to prosperity*, Speech at the Northern Powerhouse Business Summit – Great exhibition of the North, July 5.
- EC (2018), *EU adopts rebalancing measures in reaction to US steel and aluminium tariffs*, press release, 20 June 2018
- Elms D.K. and P. Low (2013), *Global value chains in a changing world*, WTO.
- Felbermayr G. and M. Braml (2018), "On the EU-US Current Account", *EconPol Policy Report 7*, May.
- Fisher K. (2018), *Trade War – What trade war?*, Opinion, *Financial Times*, 26 July.
- FOMC (2018), Minutes of the Federal Open Market Committee, July 31 – August 1.
- Foster-McGregor N. et R. Stehrer (2013), "Value Added Content of Trade: A Comprehensive Approach", *Economics Letters*, August, 120(2), 354–357.
- Grossman R. S. and C.M. Meissner (2010), "International aspects of the Great Depression and the crisis of 2007: similarities, differences, and lessons", *Oxford Review of Economic Policy*, 26(3), 318–338.
- Gunessee S., C. Milner and Z. Niu (2018), "Growing non-tariff and overall protection", *VOX CEPR Policy Portal*, 19 June.



- Handley K. and N. Limao (2017), "Trade under T.R.U.M.P. policies", 141-152.
- Hufbauer G. and E. Jung (2016), "Evaluating Trump's trade policies", *VOX CEPR Policy Portal*, 29 September.
- IMF (2016), "Global Trade: What's behind the Slowdown?", *World Economic Outlook: Subdued Demand – Symptoms and Remedies*, Washington, October, 63-119.
- IMF (2018), "World Economic Outlook", July update.
- Jackson J. K. (2018), *Trade Deficits and U.S. Trade Policy*, Congressional Research Service 7-5700, June 28.
- Javorsek M. (2016), *Asymmetries in International Merchandise Trade Statistics: A case study of selected countries in Asia-Pacific*, ARTNET Working Paper Series, 156.
- Johnson R.C. (2014), "Five Facts about Value-Added Exports and Implications for Macroeconomics and Trade Research", *Journal of Economic Perspective*, 28(2), 119-142.
- Jones B. (2018), "Americans are generally positive about free trade agreements, more critical of tariff increases", Pew Research Center, May 10.
- Kandel M. (2018), *Les The United States et le monde. De George Washington à Donald Trump*, April.
- Keynes S. and C.P. Bown (2018), *Zeroing: The Biggest WTO Threat You've Never Heard Of*, Peterson Institute for International Economics, July.
- Koopman R., Z. Wang, S.J. Wei (2014), "Tracing value-added and double counting in gross exports", *American Economic Review*, 104(2), 459-94, February.
- Lakner C. and B. Milanovic (2013), *Global Income Distribution: From the Fall of the Berlin Wall to the Great Recession*, The World Bank, Working Paper 6719.
- Lester S. and I. Manak (2018), "The Rise of Populist Nationalism and the Renegotiation of NAFTA", *Journal of International Economic Law*, Oxford University Press, 21(1), 151-169.
- Morrison, W. M. (2018), "China-U.S. trade issues", Congressional Research Service Report 7-5700, July 30.
- Schneider-Petsinger M. (2017), *Trade policy under president Trump, implications for the US and the World*, Chatham House, Research Paper, November.
- Senses M. (2017), "Globalisation and US labour markets", *VOX CEPR Policy Portal*, 6 August.
- Stahl J. (2016), *Donald Trump a trouvé le talon d'Achille d'Hillary Clinton*, Slate, 4 May.
- Timmer M. P., B. Los, R. Stehrer and G.J. de Vries (2013), "Fragmentation, Incomes and Jobs: An Analysis of European Competitiveness", Oxford Academic, *Economic Policy*, August, 28(76), 613-661.
- Timmer M.P., B. Los, R. Stehrer and G.J. de Vries (2016), *An Anatomy of the Global Trade Slowdown based on the WIOD 2016 Release*, GGDC Research Memorandum, 162.
- Tintelnot F., A. K. Kikkawa, M. Mogstad and E. Dhyne (2018), *Trade and Domestic Production Networks*, National Bank of Belgium, Working Paper 344, September.
- USTR (2017), *2017 Trade Policy Agenda of the President of the United States*, Office of the United States Trade Representative.

Vandenbussche H., W. Connell Garcia, W. Simons and E. Zaurino (2017), *America first! What are the job losses for Belgium and Europe?*, KU Leuven, Vives Discussion Paper 57, January.



# What will happen when interest rates go up ?

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## Introduction

The Eurosystem's key interest rates are still historically low, resulting in negative short-term market rates. Yet there are signs that the era of record low interest rates is coming to an end.

In the United States, for example, the Federal Reserve has already been normalising its interest rates for some time, while the election of Donald Trump as the US president in the autumn of 2016 gave a further boost to American long-term interest rates.

In the euro area, too, long-term interest rates are no longer at the record low levels of 2016. Moreover, following the June 2018 monetary policy meeting, the ECB Governing Council announced that it was increasingly confident that the positive economic performance will also be reflected in higher inflation figures. The Governing Council therefore stated that, if that expectation is fulfilled, it will begin normalising monetary policy from the autumn of 2018. The Italian interest rate rise in the spring of 2018 was an entirely different matter: the mounting uncertainty over the new Italian government's commitment to the euro drove up Italian risk premiums, further widening the interest rate differential in relation to other European countries.

Against that backdrop, this article describes the possible consequences of higher interest rates for the economy of the euro area, and more specifically for the Belgian economy. It approaches that issue from a macroeconomic perspective, focusing on the non-financial sectors, although it does discuss the financial sector as the channel for transmitting interest rate conditions to the other sectors.

The first section recalls how the situation of record low and even negative interest rates came about, referring to the main conclusions of De Backer and Wauters (2017): in recent decades, structural factors have driven up the propensity to save and depressed the propensity to invest, triggering a marked fall in the equilibrium interest rate. Furthermore, after the great recession, central banks were obliged to cut interest rates even lower in order to safeguard macroeconomic stability. As the cyclical recovery is continuing, a number of central banks have begun to normalise their policy.

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Next, the article explains two aspects associated with the normalisation of monetary policy. First, its expected macroeconomic impact is analysed. In order to gain a better understanding of the macroeconomic implications of rising interest rates, we use a structural macroeconomic model for the euro area developed by the NBB. We show that an interest rate rise need not necessarily be negative for the macro economy: if it is driven by improved demand prospects, then an interest rate rise is actually desirable. However, that is not the case if the higher interest rate is due to restrictive monetary policy shocks or adverse supply shocks.

Second, the interaction between the normalisation of policy interest rates and the large portfolio of government securities held by the central banks is looked into. At present, the policy interest rate is only one of the monetary policy instruments: asset purchases are also an important tool for steering the monetary policy stance. We show how the short-term interest rate can be normalised more quickly thanks to the downward impact exerted on the long-term interest rate by government securities held on central bank balance sheets. That phenomenon also needs to be taken into account when interpreting the slope of the yield curve as an indicator of recession risk.

Following the macroeconomic discussion concerning higher interest rates, the third section describes the sector-specific implications. In contrast to the model-based analyses in the previous section, the analysis here is based on more descriptive statistics.

Governments have seen a sharp decline in their interest expenditure as a result of the very low interest rates on public debt. Furthermore, many governments have taken the opportunity to extend the maturity of their debt, providing a certain buffer against rising interest rates. Looking forward, it appears that the positive difference between nominal growth and nominal interest rates is unprecedentedly favourable for the reduction of government debt, except in Italy. For its part, owing to its asset purchase programmes, the central bank is seriously exposed to financial risks associated with rising interest rates. The interpretation and implications of these risks are also discussed.

Regarding the private sector, it is worth noting that the interest burden of Belgian households is almost unchanged: the lower interest rates have been accompanied by rising debts. A high proportion of fixed-rate loans should help to limit the impact of rising interest rates on Belgian households, just as it does for the Belgian government. The debt service ratio (DSR), which indicates the repayment burden, is a crucial variable in this analysis. Although the DSR of Belgian households is already relatively high, simulations indicate that the rising interest rate will cause the DSR to edge up only slightly. For businesses, the risks of a weak repayment capability tend to be low. Also, in the medium term, a tightening of monetary policy could be good for the DSR, via a decline in the debt level.

The section on the sector-specific impact ends with an open question which is relevant for Belgian households that keep substantial savings in the banks: what will happen to deposit remuneration once market interest rates begin to rise? In the United States, it is noticeable that deposit interest rates have hardly responded to the higher Fed policy rates. That could suggest that banks are thus trying to improve their profitability. However, other factors, such as the greater ease with which households can transfer deposits or convert them into other forms of investment, may put pressure on the banks to pass on the higher market interest rates in their remuneration.

The final section presents the conclusions.

## 1. The economic upturn is reflected in higher interest rates

### 1.1 Structural factors largely account for the current low interest rate level...

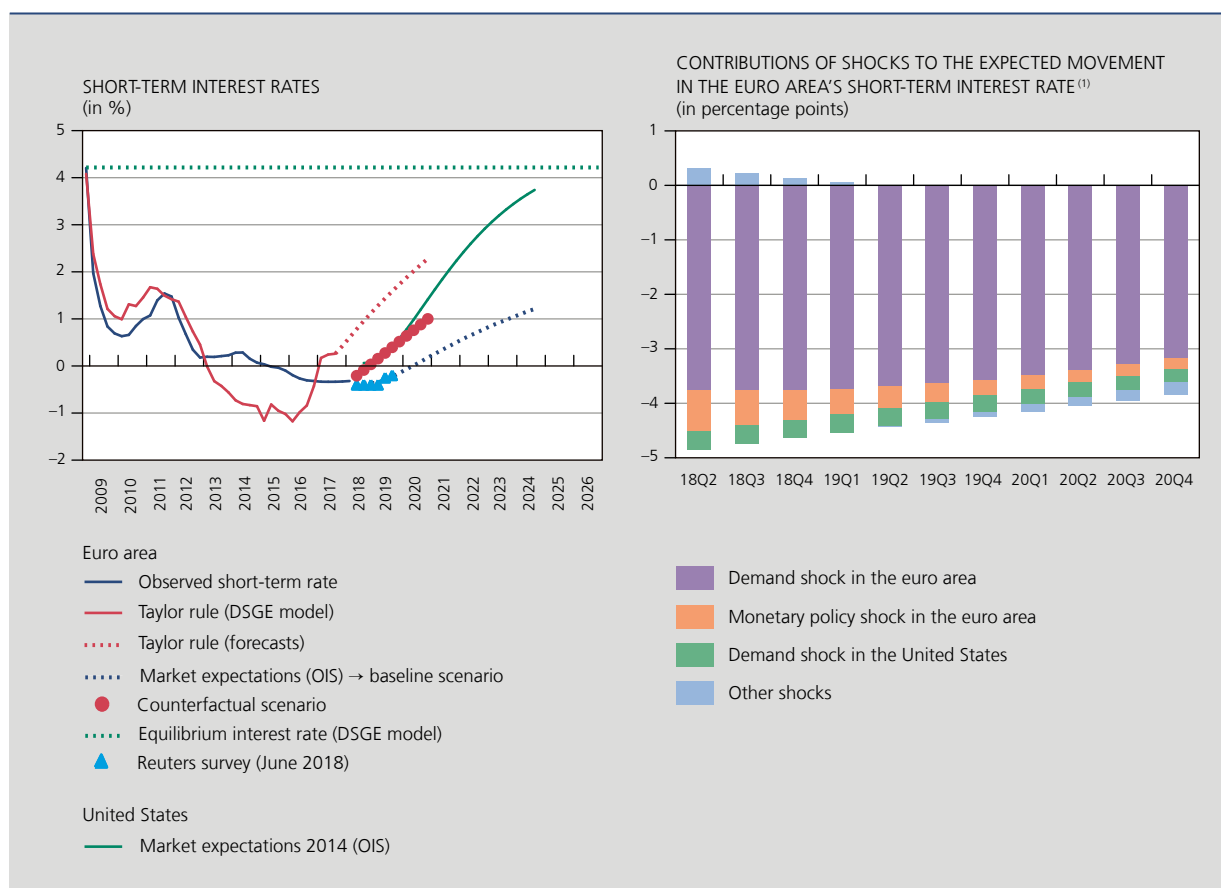
In recent years, interest rates have dropped to an historically low level as a result of both structural and cyclical factors.

Interest rates have been on a downward trend for several decades, driven by various global structural factors which have contributed to an increase in the supply of savings and a decline in demand for investment. As explained in De Backer and Wauters (2017), some demographic trends (rising life expectancy and an increase in the population of working age) and social trends (greater inequality) have supported the growth of savings. Moreover, in the emerging economies there has been a big increase in savings since the Asian crisis of 1997-1998. At the same time, demand for investment has

fallen in the past few decades, partly as a result of slower productivity and the decline in potential growth in advanced economies. The combined influence of these factors has resulted in a savings surplus that has gradually been driving down interest rates for many years.

## 1.2 ... but the better economic situation allows for a gradual normalisation of interest rate levels

**CHART 1** INTEREST RATES AND UNDERLYING SHOCKS



Source: NBB, own calculations based on the model of de Walque *et al.* (2017).

(1) Difference between the short-term interest rate expected by the market (baseline scenario) and the equilibrium interest rate.

Apart from structural factors, cyclical factors have also played a role in the low interest rate environment. Since 2008, the impact of the financial and economic crisis on the economy, and especially on inflation, has induced the central banks to cut their key policy interest rates in order to stimulate the economy. In the euro area, from 2009 the ECB's policy rate dropped below its long-term equilibrium level<sup>(1)</sup>, as estimated on the basis of the NBB's dynamic stochastic general equilibrium (DSGE) model (see Box 1). Until 2013, the policy rate moved in line with the Taylor rule estimated by that model<sup>(2)</sup>. From 2013 to 2017, the interest rate indicated by strict application of the Taylor rule was lower than the actual interest rate recorded during that period, suggesting that conventional monetary policy was constrained by a lower bound.

In contrast, since 2017, the interest rate corresponding to the Taylor rule has risen above the observed three-month interest rate. This means that the economic recovery could enable the central banks to withdraw some of their stimuli

(1) The equilibrium interest rate, estimated at around 4% for the euro area, must be interpreted with caution. The model used for that estimate is intended mainly to model the cyclical fluctuations in the economic variables. It therefore takes little account of the structural factors described in the preceding point, which influence the equilibrium interest rate of the economy.

(2) The Taylor rule, proposed by Taylor (1993), measures the empirical relationship between the short-term interest rate and developments in inflation and economic growth.

and begin normalising interest rates. However, at the moment, the normalisation in the euro area is still expected to be very gradual because of the slow convergence of inflation towards the ECB's objective. The interest rate expectations derived from the OIS long-term interest rate and the Reuters survey indicate that the markets expect short-term interest rates to creep upwards very slowly over the coming years. That contrasts with the interest rate path expected in the United States when the markets anticipated the exit from the accommodative monetary policy (the expectations recorded in April 2014 are shown by way of indication in chart 1), before the end of the net asset purchases. At that time, the markets foresaw a much faster interest rate rise than they do now in the euro area. The difference between those interest rate expectations on either side of the Atlantic is due to the higher growth and inflation outlook in the United States at that time, compared to the current forecasts for the euro area.

The historical breakdown, based on the aforementioned DSGE model, of the gradual normalisation of interest rates expected by the markets shows how that model interprets the cyclical factors that may explain those expectations. According to the model, the expected gradual rise in the short-term rate towards its equilibrium level is due to the gradual disappearance of the downward pressure on demand in the euro area and, to a lesser degree, in the United States. The hesitant rise in the expected short-term rate is therefore due to the endogenous response of monetary policy to these demand shocks. The contribution of the monetary policy shocks, which reflect the non-systematic response of monetary policy (see box 1), is relatively smaller and also diminishes over time. That interpretation is consistent with the historical importance of conventional monetary policy shocks: they explain only a small fraction (7 %) of the variations in the short-term interest rate during the period from 1995 to 2012. In contrast, the endogenous response of monetary policy to the other shocks in the economy, via the estimated Taylor rule, makes a major contribution to interest rate fluctuations. For instance, the contribution of demand shocks to the fluctuations in the short-term rate over the same period is estimated at almost 60 %.

## Box 1 – The NBB's DSGE model

In their Working Paper, de Walque *et al.* (2017) developed a tool that models the cyclical fluctuations in the aggregate economy of the euro area and of the United States. The model is constructed and estimated on the basis of the literature on the dynamic and stochastic general equilibrium (DSGE) models forming the foundation of modern macroeconomics.

The model's equilibrium equations comprise a Taylor rule that indicates how conventional monetary policy is conducted. According to the Taylor rule applied in the model, monetary policy sets the short-term interest rate  $r_t$  in relation to the equilibrium rate  $r^*$  in response to the observed changes in inflation  $\pi_t$ , and the level and growth of the output gap  $\tilde{y}_t$  in the monetary union.

$$r_t = r^* + \rho(r_{t-1} - r^*) + (1 - \rho)\theta_\pi \pi_t + (1 - \rho)\theta_{\tilde{y}} \tilde{y}_t + \theta_{\Delta \tilde{y}} \Delta \tilde{y}_t + \varepsilon_t$$

The coefficient  $\rho$  takes account of the gradual adjustment of the short-term interest rate, while the term  $\varepsilon_t$  can be interpreted as a monetary policy shock. That shock reflects the non-systematic response of monetary policy. In the model, the economic agents assume that monetary policy follows the Taylor rule. Every deviation from that rule is a "surprise" in relation to the agents' expectations, and is reflected by the monetary policy shock. In practice, that surprise may be added deliberately by the monetary policy-makers, e.g. because they have more information<sup>(1)</sup> on economic developments and/or because their expectations differ from those of the markets, or because they want to change agents' expectations (e.g. the disinflation policy in the early 1980s).

Besides the monetary policy shock, the model also comprises a whole range of other exogenous variables. Among the most important are the demand and supply shocks, and the shocks from outside the euro area.

(1) Although the decisions are based on leading indicators and the outlook for inflation and economic activity, account must still be taken of the possibility that future economic shocks are sometimes poorly estimated at the time of determining the key interest rate. That could also be reflected in the monetary policy shock.



Demand shocks drive growth and inflation in the same direction. In the model, they are shocks that influence the preferences of consumers and investors, and will cause a direct change in consumption and investment. In practice, they may correspond, for example, to a change in agents' confidence in the economy. In a period of uncertainty, a negative shock generally leads to a decline in consumption, a rise in saving, and the postponement of investment until economic conditions are more favourable. Such a shock may also include disruption of financial intermediation, which hampers access to credit and has a negative influence on consumption and investment. It may likewise result from debt reduction in the private sector, inhibiting consumption and investment.

Supply shocks typically steer output and inflation in opposite directions. One of the commonest examples is a total factor productivity shock. A technological innovation that increases the productivity of the production factors enables firms to produce the same or bigger quantities at lower cost. That shock therefore leads to increased output and lower prices.

Finally, external shocks cover a broad category of shocks originating from outside the euro area. They may be supply shocks, demand shocks or monetary policy shocks stemming from abroad. Those shocks influence the euro area's economy indirectly via international trade. One example is a technological innovation that invigorates the productive sector outside the euro area, causes the prices of foreign goods to fall, and boosts European demand for those goods. In general, every foreign shock that changes demand for European goods, either directly or indirectly via relative prices, is an external shock. For instance, an unexpected adjustment to the Federal Reserve's monetary policy does not only influence the US economy but also affects the bilateral exchange rate and is thus transmitted to the European economy.

In this article, the two-country DSGE model is used to simulate a baseline scenario of interest rate normalisation and a counterfactual scenario, and to compare them with one another (see section 2 for the results). These simulations are based on a conditional projection whereby the model is made to reproduce a specific future path for the short-term interest rate. In the baseline scenario, the model's forecast is determined by market interest rate expectations. To satisfy that condition corresponding to an interest rate which is below the equilibrium rate, a statistical filter is used in the model, namely the Kalman filter, in order to examine the shocks required to achieve the intended interest rate path. The result of that allocation of the shocks is shown in the right-hand panel of chart 1. For the counterfactual scenario, the model assumes the shock breakdown used in the baseline scenario, to which demand shocks, monetary policy shocks and supply shocks in the euro area are added alternately in order to obtain a scenario in which the interest rate rises faster than in the baseline scenario.

## 2. Monetary policy normalisations are not always alike

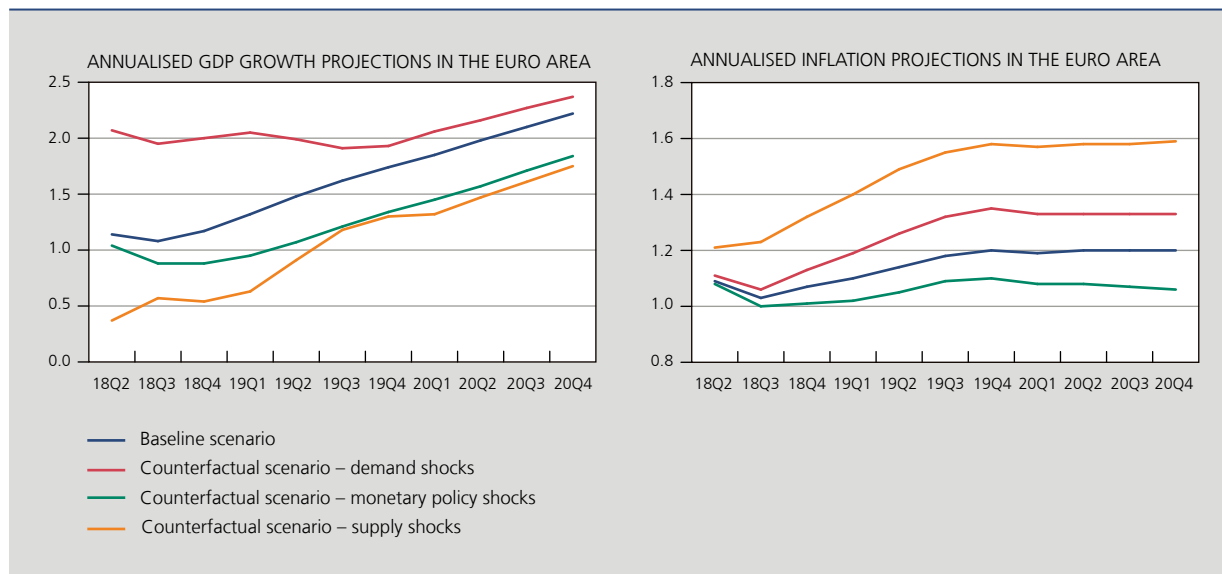
### 2.1 The macroeconomic impact of the normalisation depends on the factors underlying the rise in interest rates

Should we be worried about the macroeconomic impact of an interest rate rise? Using detailed simulations with the DSGE model, we can investigate the macroeconomic impact of a bigger-than-expected rise in the short-term interest rate. The market expectations described above regarding future short-term interest rate movements in the euro area form the baseline scenario for these simulations. In the counterfactual scenario, we assume a faster rise in the short-term rate towards its equilibrium level (shown in red in the left-hand panel of chart 1). That counterfactual scenario is generated in three different ways, by alternately adjusting the factors responsible for that faster convergence.

In the first simulation, the downward pressure on demand in the euro area economy was reduced in order to obtain the counterfactual interest rate picture. The reduction in those shocks reflects greater confidence in the economy among the economic agents, so that they consume and invest more. These demand shocks, which are less negative than in the baseline scenario, require a less accommodative monetary policy, and thus allow for a sharper rise in interest



**CHART 2** RESULTS OF THE NBB'S DSGE MODEL  
(in %)



Source: Own calculations based on the model of de Walque *et al.* (2017).

rates. Due to the less negative demand shocks, the euro area economy records higher growth and inflation than in the baseline scenario. This first counterfactual simulation shows that a faster normalisation of the interest rate need not be accompanied by negative macroeconomic effects, provided that it results from the more rapid disappearance of factors depressing demand.

A second simulation assumes that the faster rise in the short-term interest rate is due to monetary policy shocks. In the model, this amounts to the monetary policy-makers surprising the market by increasing the key interest rate faster. This scenario therefore corresponds to a monetary policy that is more restrictive than the economic fundamentals require, and is accompanied by negative effects on growth and inflation.

Finally, the third counterfactual scenario covers the situation in which the faster rise in the short-term interest rate is due to shocks affecting the supply side of the economy. More specifically, this concerns shocks which suddenly lower the economy's production capacity, for example, an unexpected fall in total factor productivity. Such negative productivity shocks lead to lower economic growth than in the baseline scenario. They also raise the general price level, triggering a monetary policy response. Faced with this type of shock, the central bank has to strike a compromise between stabilising economic activity around its potential level and safeguarding the monetary policy inflation objective. According to the estimated Taylor rule, such a compromise leads to a faster rise in the short-term interest rate in order to counteract the inflationary pressures.

To sum up, the counterfactual analysis shows that the macroeconomic consequences of an interest rate rise need not be negative. They depend to a large degree on the inherent cause of the rising interest rate. If that rise is due to the faster-than-expected elimination of the downward pressure on demand, then it is accompanied by stronger growth and higher inflation. If it is due to an unexpected tightening of monetary policy, then it will produce negative effects on both the real and nominal side of the economy. Finally, if it results from the monetary policy response to negative supply shocks, then it will be accompanied by lower-than-expected growth and higher-than-expected inflation.

## 2.2 The normalisation of interest rates interacts with the reinvestment of securities purchased under the asset purchase programme

In the model used, the short-term interest rate is the only monetary policy instrument. However, changes in key interest rates (and expectations in that regard) form only one aspect of the current monetary policy in the euro area: the central bank balance sheet has also become an essential monetary policy instrument. As announced by the ECB, euro area monetary policy will initially be normalised by ending the unconventional policy (namely the net asset purchases). In June 2018, in view of the progress made in adjustment towards the inflation objective, the ECB Governing Council announced that it probably would end the programme of net asset purchases in late 2018 provided inflation moves in line with expectations. The underlying strength of the euro area's economy and the ample degree of monetary accommodation create confidence in the sustained convergence of inflation towards the objective, even after the gradual winding down of the net asset purchases.

To avoid any unjustified tightening of financial conditions once the net asset purchases have ended, other monetary policy measures will continue to provide the accommodation still required in order to ensure the sustained convergence of inflation to the ECB's objective. On the one hand, the key interest rates will remain unchanged "at least through the summer of 2019 and in any case for as long as necessary to ensure that the evolution of inflation remains aligned with the current expectations of a sustained adjustment path"<sup>(1)</sup>. On the other hand, the principal payments from maturing securities purchased under the APP will continue to be reinvested "for an extended period of time after the end of the net asset purchases, and in any case for as long as necessary to maintain favourable liquidity conditions and an ample degree of monetary accommodation". Reinvestment may continue even if the key interest rates rise, which could affect the shape of the yield curve. The first policy rate increases will drive up the short-term interest rate, whereas the reinvestment will continue to exert downward pressure on longer-term rates via their impact on the term premium.

The term premium is a means of measuring the uncertainty over future developments; thus, it is usually higher for longer maturities than for shorter ones. Its level depends on the equilibrium between the supply of and demand for a specific asset<sup>(2)</sup>. Since net asset purchases by the central bank boost demand for some assets, they drive down the term premium<sup>(3)</sup>, so that the long-term interest rate is lower for a given short-term interest rate path. Similarly, reinvestments – which keep the total amount of assets held on the central bank balance sheet steady – reduce the quantity of assets available on the market, with a comparable effect on the term premium.

That interaction thus also influences the speed with which policy rates can be raised while maintaining the desired monetary policy stance. For a given long-term interest rate, a lower term premium enables the central bank to start raising the short-term rate. Conversely, a decline in the central bank's balance sheet total would cause the term premium to rise, and therefore the policy rates would need to increase more slowly to achieve the same long-term interest rate.

A breakdown of the risk-free interest rate<sup>(4)</sup> shows how monetary policy expectations influence, *inter alia*, the level and composition of interest rates, including long-term rates. As stated in the preceding section, in May 2018, the markets expected interest rates in the euro area to rise very gradually, remaining very low even over ten years. Meanwhile, expectations regarding reinvestment have also kept the term premiums at a very low level, and even negative for the shorter maturities. Both interest rate expectations and the term premium were much lower in 2018 than in 2004, a "normal" period for monetary policy, i.e. a period in which the economy was not confronted by a recession or a boom, and the central bank had not taken any non-standard measures such as asset purchases. Consequently, the yield curve in the euro area was considerably steeper in January 2004 (225 basis points) than in May 2018 (113 basis points).

Many observers regard the slope of the yield curve as a useful instrument for predicting recessions: negative slopes (where the ten-year yield is lower than the short-term interest rate) are said to point to gloomy expectations about the future level of interest rates, which may indicate concern about the economic outlook. A significant flattening of the curve is therefore interpreted as signalling a higher risk of recession<sup>(5)</sup>.

(1) Draghi (2018).

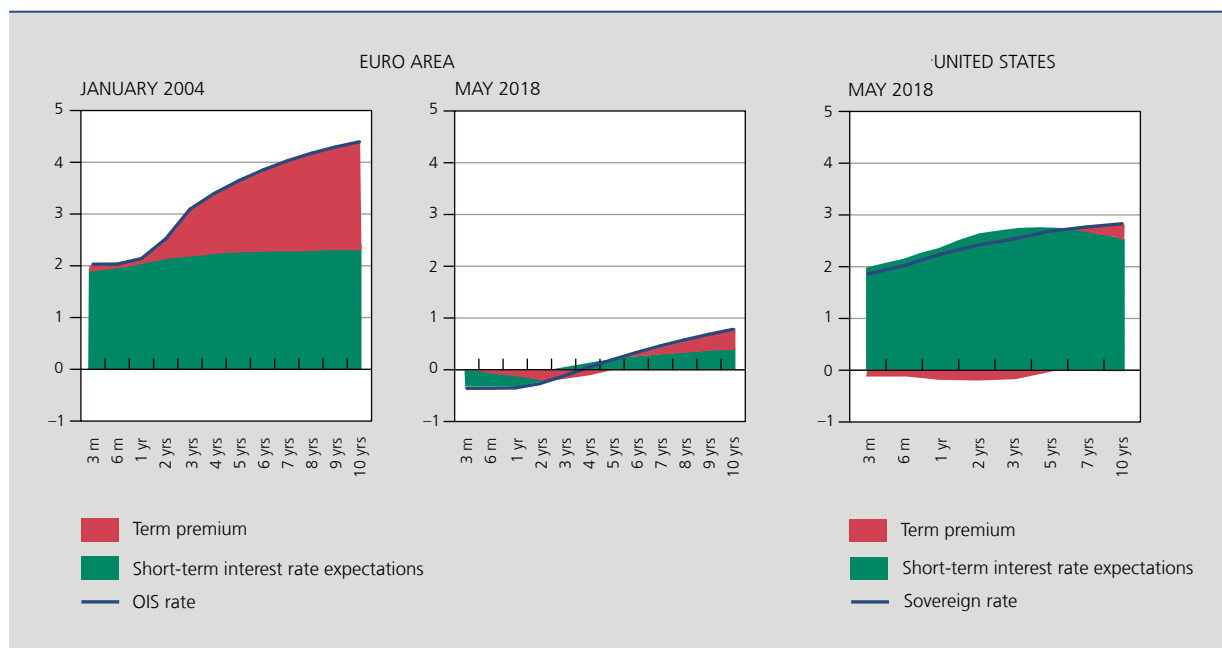
(2) Greenwood and Vayanos (2014).

(3) See for example Bonis *et al.* (2017).

(4) Decomposition of the OIS rate for the euro area on the basis of a term structure model which takes account of the presence of a lower bound on interest rates, see Dewachter *et al.* (2016).

(5) For a discussion of the literature on the subject, see Wheelock and Wohar (2009).

**CHART 3** BREAKDOWN OF THE RISK-FREE INTEREST RATE  
(in %)



Source : Own calculations, based on the model of Dewachter *et al.* (2016).

However, the downward pressure exerted on the term premium by the central bank's asset holdings could nuance that conclusion: for a given risk of crisis, the curve would be flatter than if the central bank's balance sheet were smaller. That is currently true to some extent for interest rates in the United States. Models comprising term premiums (and other financial variables) for estimating the likelihood of a recession predict far smaller risks than a model which only takes account of the slope of the curve<sup>(1)</sup>.

Nonetheless, the signals derived from the slope of the curve must not be ignored: factors associated with less positive growth prospects may not only depress interest rate expectations<sup>(2)</sup>, but also the term premiums (e.g. increased demand for "risk free assets").

### 3. Impact of higher interest rates on governments, firms and households

In this section we no longer examine the question of rising interest rates from a general equilibrium perspective, but investigate in more detail the impact on the various economic sectors, focusing on the six largest euro area economies. To ascertain the effect that an interest rate rise will have, we also look at the experience of the steep fall in interest rates following the great recession. After reviewing the changes in the interest income of the various sectors since the crisis, we proceed to look at the government, the central bank, households and firms and consider how bank deposit interest rates will react to a rising interest rate.

#### 3.1 Sector-specific interest rate sensitivity

The direct impact of an interest rate change on the various economies and sectors can be measured by the change in their net interest income (difference between interest received and interest paid). It should be noted that no account

(1) Johansson and Meldrum (2018).

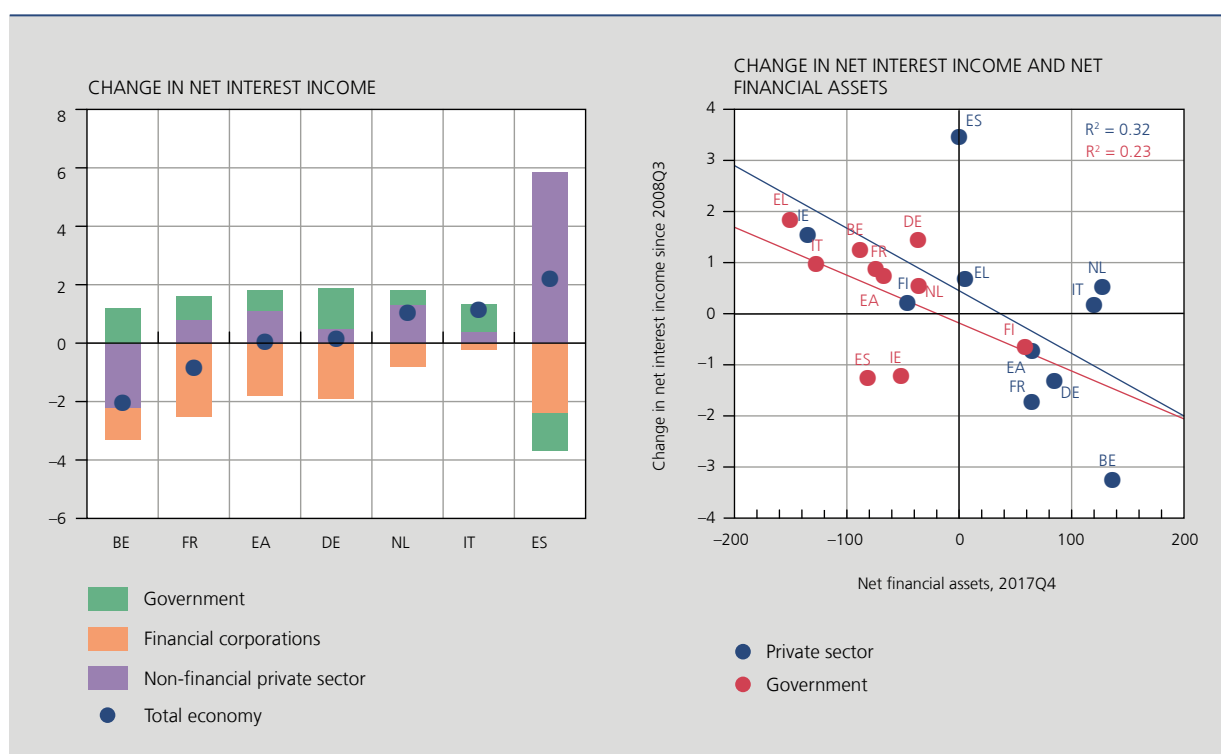
(2) *Ibidem* and Bauer and Mertens (2018).

is taken here of the indirect effects of an interest rate change, such as the impact on other incomes (e.g. dividends), or on asset price developments.

Analysis of the period since the great recession (2008Q3-2017Q4), during which monetary policy was accommodative and interest rates therefore declined sharply, reveals wide variations in the interest rate sensitivity of the various economies and sectors in the euro area. For the euro area as a whole, the impact was neutral, whereas net interest income increased in some countries (Spain, Italy) and declined in others (Belgium, France). Regarding the sectors, the non-financial private sector and the government saw their net interest income increase, while the financial sector recorded a decline.

The divergent impact on the various countries and sectors shows that the size and composition of their balance sheets are crucial to their interest rate sensitivity. If interest rates fall, net creditors (assets > liabilities) will generally suffer a loss of income, while net debtors (assets < liabilities) will see their income increase. A decline in interest rates therefore has a redistribution effect. In the euro area, there is a fairly close link between the impact on net interest income and the size of net financial assets (i.e. the difference between the outstanding financial assets and liabilities). However, that link is not perfect since net financial assets also comprise non-interest bearing assets, such as shares. Other factors, too, such as the interest rate variability of financial instruments and the movement in outstanding assets and debts, determine the ultimate effect.

**CHART 4** CHANGE IN NET INTEREST INCOME DRIVEN BY NET FINANCIAL ASSETS  
(in % of GDP, 2008Q3-2017Q4)



Sources: ECB, NBB.

Of the countries for which data are available, Belgium suffered the biggest loss of income as a result of the fall in interest rates. That is attributable to the substantial net wealth of the private sector, especially households. As in the euro area as a whole, the financial sector in Belgium experienced a fall in its net interest income, while the government saw its income rise. In so far as that impact is driven by the net wealth of the sectors, a (symmetrically) opposing effect is to be expected if interest rates increase.

### 3.2 Public sector

Since the start of the crisis, government debt in the euro area has risen sharply. In most cases, it has also remained high. In 2017, as regards the six largest economies, public debt amounted to almost 100 % of GDP in France and Spain, while it exceeded that level in Belgium and Italy. In Germany and the Netherlands debt was gradually reduced to 64 % and 57 % respectively.

Naturally, the low interest rate makes heavy debts more affordable. What is more, interest charges have fallen further to historically low levels: in 2017, for the six largest economies, they ranged between 1 % of GDP in the Netherlands and 2.5 % of GDP in Belgium to just under 4 % of GDP in Italy. As soon as interest rates begin rising, the question is evidently whether the high government debts will be sustainable. We shall now examine that question more closely.

#### *Higher market interest rates are only gradually reflected in higher implicit interest rates*

To gain a general idea of the interest rate on the outstanding public debt, we look at the implicit interest rate. It is calculated as the ratio between interest charges and debt. In line with market interest rates, implicit interest rates also continued falling to their lowest levels since the start of the monetary union. In 2017, they amounted to 1.6 % in Germany and the Netherlands, 2.4 % in Belgium and 3 % in Italy. However, the implicit interest rate responds with a lag to changes in market interest rates since it is an average of the market interest rates on debt incurred in the past.

For that reason, a rise in market interest rates will not be reflected in a directly proportional increase in the implicit interest rate on the public debt. Moreover, an increase in market interest rates will not necessarily drive up the implicit interest rate. So long as the market interest rate on new issues is lower than the rate on the government's maturing securities and loans, the implicit interest rate will maintain a downward trend.

In addition, euro area governments have modified their debt structure since the crisis, making it less sensitive to a rise in interest rates. On the one hand, they issued longer-term debt instruments enabling them to take advantage of the low interest rates for longer and to delay the impact of a future rate rise. Thus, the average term of the outstanding public debt securities in the euro area increased from 6.4 years at the end of 2009 to 7.3 years at the beginning of 2018. In Belgium, it actually increased from 5.5 years to 9.5 years over the same period. On the other hand, the share of short-term debt diminished in most euro area countries (after having risen sharply during the financial crisis). In 2017, it was generally below 10 % of GDP. Only in Italy and Portugal did the share of the debt with an original maturity of up to 1 year remain substantial (at 17 % and 22 % of GDP respectively); those countries are therefore more vulnerable to an interest rate rise or financing problems.

Nevertheless, in the longer term, public finances are still vulnerable to an interest rate rise: higher rates could significantly increase the interest rate burden, certainly in countries with a high debt ratio.

#### *GDP growth and inflation are also key elements in debt dynamics*

It is not only nominal interest rates that influence the sustainability of public debt; nominal economic growth also plays a part. That is clear from the simplified debt dynamics equation:

$$\Delta d_t = -p_t + (i_t - g_t)d_{t-1}$$

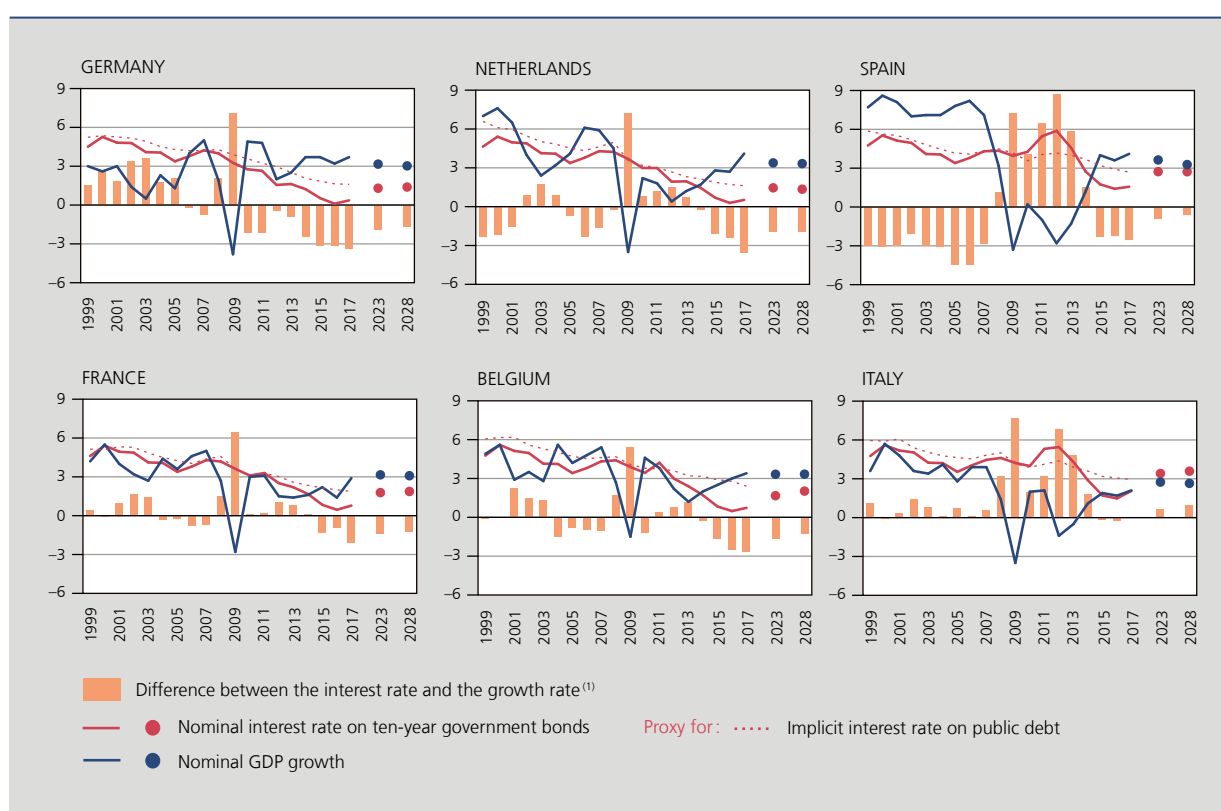
in which the change in the public debt ratio ( $\Delta d$ ) depends on the primary balance ( $-p$ ), i.e. the budget balance excluding interest charges, and the interest burden on the debt of the preceding period ( $(i - g)d_{t-1}$ ). In the case of a balanced primary budget ( $p = 0$ ) the interest-growth differential determines the debt dynamics: if the nominal implicit interest rate ( $i$ ) is higher (lower) than nominal GDP growth ( $g$ ), then the debt ratio increases (declines).

This equation also shows that the impact of higher interest rates on the debt ratio depends on the underlying shocks. Where an interest rate rise is due to an exogenous tightening of monetary policy or an increase in the risk premium (e.g. on account of political and/or policy uncertainty in a country), the debt dynamics will deteriorate. Apart from the direct impact on the interest charges, the interest rate increase also depresses growth via a tightening of financial

conditions. That in turn has an adverse effect on the debt dynamics via two additional channels: the negative impact on the interest rate growth dynamics is exacerbated and, without a change of policy, the primary balance will deteriorate. Conversely, an interest rate rise which is due to an improving macroeconomic environment (positive demand shock) will not necessarily alter the debt dynamics: not only will the interest rate rise, nominal growth will also pick up.

It is intuitively assumed that the longer-term nominal interest rate exceeds nominal growth, because the long-term interest rate corresponds approximately to the sum of economic growth, inflation, a term premium and a credit risk premium (which are generally positive). Before the crisis, the long-term nominal interest rate was generally higher than nominal growth in the six largest euro area economies. The positive difference between the interest rate and the growth rate automatically pushed up public debt. It should be noted that Spain was an exception, thanks to its strong nominal growth; but the crisis showed that the high growth figures were not sustainable.

**CHART 5** LONG-TERM NOMINAL INTEREST RATE AND NOMINAL GDP GROWTH  
(in %; year-on-year percentage change)



Sources: Consensus Economics, Datastream, EC.

Note: For the period 1999-2017, nominal GDP growth is calculated as the sum of real GDP growth and the growth of the GDP deflator. The nominal GDP growth projections were taken from the July 2018 survey conducted by Consensus Economics and are calculated as the sum of the private sector's expectations concerning real GDP growth and inflation measured by the consumer price index (CPI).

(1) The interest-growth differential is calculated here as the nominal ten-year market interest rate on government bonds minus nominal GDP growth. In contrast to the debt dynamics equation, it is therefore not the implicit interest rate on the public debt that is used (although it is included in the charts for information). The ten-year market rate does actually differ from the implicit rate, but it is common to use it as a substitute in similar analyses as it simplifies the interest rate projections (simulations of implicit interest rates are based on various assumptions, e.g. concerning the future path of market interest rates, the debt trajectory, the average maturity of debt, etc.).

During the crisis, the difference between the interest rate and the growth rate worsened owing to negative economic growth, low inflation and – in countries regarded as riskier – higher credit risk premiums which drove up the nominal interest rates on public debt.

However, at present, the difference between the interest rate and the growth rate is generally negative, mainly due to the historically low interest rates and – to a lesser degree – the strengthening of nominal growth. Projections produced by private sector economists (like those collected by Consensus Economics, which are used in the chart) and by institutional

organisations (such as the EC and the ECB) show that the interest-growth differential will remain negative far into the future and will thus help to reduce the public debt. That is exceptional in historical terms. The combination of low interest rates and the return to somewhat higher GDP growth (although generally still below its pre-crisis level) is therefore very favourable for the debt situation. However, that positive picture does not apply to Italy, the only one of the six largest euro area economies where the interest-growth differential is positive for the future, owing to the combination of higher interest rates and slower economic growth. In order to stabilise or reduce its debt ratio, the Italian government therefore needs to achieve primary surpluses.

However, there are downside risks associated with the scenarios described here. For instance, as already mentioned, a sudden rise in the risk premium can make the interest-growth differential less favourable and cause the debt dynamics to deteriorate. The same applies to a weakening preference for risk-free assets, such as government paper. It is also possible that accelerating economic growth and inflation (outpacing current expectations) will prompt the central banks to tighten their policy so that the (risk-free) nominal interest rate will again exceed nominal economic growth.

The favourable macroeconomic and financial context must therefore not cause governments – certainly in countries with a high debt ratio – to refrain from fiscal consolidation measures; on the contrary. By rebuilding fiscal buffers, governments will be able to address future risks and challenges, and ensure that the current favourable conditions make a lasting contribution to the sustainability of public debt.

### *As well as influencing public expenditure, rising interest rates also affect public revenues*

A detailed analysis of the impact of an interest rate rise on public revenues is beyond the scope of this article. But it is worth noting that the monetary stimulus measures, and particularly the asset purchase programme, do not only influence government expenditure – via the interest rate on government bonds – but also affect government revenues – via the profits that central banks pay out to their shareholder governments.

On the one hand, the central bank makes a profit from its asset purchase programme<sup>(1)</sup>. Purchases of long-term fixed-rate securities are financed by issuing short-term debt (namely central bank reserves) which is remunerated at the deposit facility interest rate. At present, that rate is negative, and it is generally lower than the rates on the securities purchased. On the other hand, the asset purchase programme exposes the central bank balance sheet to an interest rate risk that arises if the interest rate on the deposit facility exceeds the yields on the securities held by the central bank. In such a situation, the central bank could see its profits diminish, or it might even incur losses. Many national central banks in the euro area have already adjusted their reserve policy accordingly. For example, since 2014, the NBB has allocated 50 % of the profits to the reserves, instead of 25 %, and will continue to do so for as long as the period of non-standard monetary measures persists<sup>(2)</sup>. This means that the government now receives lower dividends than if the reserve policy had not been changed.

### 3.3 Non-financial private sector

In the Belgian non-financial private sector, households have seen their net interest income decline most sharply during the period of accommodative monetary policy. Over the period 2008Q3-2017Q4, they turned from net interest recipients, to the tune of 0.8 % of GDP, into net interest payers, for the sum of 1.2 % of GDP.

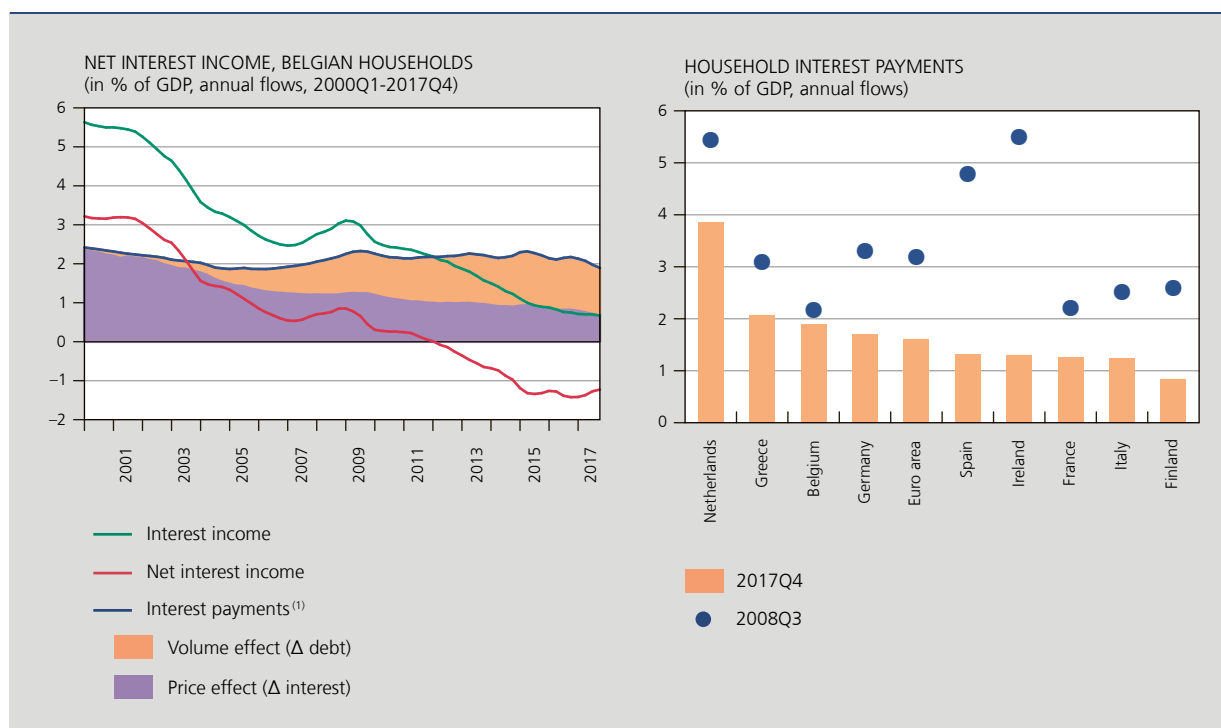
As in the other euro area countries, Belgian households saw their interest income decline. At the end of 2017, that income totalled 0.7 % of GDP, comparable to the euro area average. Interest payments stabilised at around 2 % of GDP and – despite the falling interest rates – did not exhibit any downward trend as they did in most other countries.

The impact of an interest rate change on interest payments varies from one country to another and depends partly on the underlying trend in debt and on the variability of the interest rate on outstanding loans. Countries with strong “deleveraging” (i.e. debt reduction) and those where loans are predominantly subject to variable interest rates, such as Spain, saw the sharpest fall in the interest burden. In Belgium, the decline in interest rates exerted only limited

(1) For more information on the asset purchase programme and its impact on public finances, see also Cordemans et al. (2016).

(2) For more information on the Bank's reserve policy, see for example NBB (2018).

**CHART 6** INTEREST PAYMENTS BY BELGIAN HOUSEHOLDS REMAINED HIGH AS A RESULT OF DEBT ACCUMULATION



Sources: ECB, NBB.

(1) Decomposition of the change in interest payments since 2000Q1.

downward pressure on interest charges, owing to the continuing rise in the household debt ratio and the relatively large proportion of fixed-rate loans.

The change in the interest burden can be broken down into a part attributable to the change in the (implicit) interest rate (i.e. the price effect) and a part due to the change in outstanding debts (i.e. the volume effect). The volume effect is the main factor behind the continuing high level of interest payments in Belgium.

***Large proportion of fixed-rate loans limits the variability of the implicit interest rate***

Although the relatively high interest payments of Belgian households are due mainly to the increased debt level, the implicit interest rate also declined less sharply than in the other countries. The variability of the implicit interest rate is determined by the strength and speed of the monetary transmission process, which in turn depends on structural factors such as the percentage of loans at variable as opposed to fixed interest rates.

The percentage of variable-rate loans<sup>(1)</sup> (in relation to the total outstanding amount of bank loans) diverges widely in the euro area. With respect to households, Belgium features – with its neighbours Germany, France and the Netherlands – among the countries with a relatively small proportion of variable-rate loans (8.6% at the end of 2017). In Finland, Portugal, Spain and Ireland, that rises to over 75% of the total.

In the countries with a high percentage of variable-rate loans, the change in the implicit interest rate is larger and faster. While the implicit interest rate on household debt in Belgium and the Netherlands declined by 1.3 percentage points over the period 2008Q3-2017Q4, it fell by more than twice as much in the countries where the loan market consists mainly of variable-rate loans.

(1) Defined as loans with an interest rate revision within 12 months and an initial and residual maturity of more than one year (source: MIR survey).



If interest rates rise, a similar effect can be expected, with the implicit rate rising faster and more sharply in the countries where variable rate loans predominate<sup>(1)</sup>.

### *Low interest rate risk for the Belgian non-financial sector despite the high household debt level*

The non-financial private sector's vulnerability to an interest rate rise can be assessed by means of a "heat map" comprising a number of indicators which measure the exposure (i.e. the debt level) and sensitivity to interest rate fluctuations (percentage of variable-rate loans).

Four indicators were selected for both households and non-financial corporations. The exposure is measured on the basis of three indicators, namely the debt level as a percentage of GDP and as a percentage of financial assets (as a percentage of capital in the case of companies) and the debt service ratio (DSR, see box 2 for the calculation). The latter measures the repayment burden, i.e. the percentage of disposable income (gross operating surplus) used to meet the capital repayments and interest charges associated with a particular debt position. The percentage of variable-rate loans indicates the rate-adjustment risk.

**TABLE 1** IMPACT OF INTEREST RATES ON THE SUSTAINABILITY OF NON-FINANCIAL PRIVATE SECTOR DEBT: HEAT MAP

Country	HOUSEHOLDS					NON-FINANCIAL CORPORATIONS				
	Debt/GDP ratio	Debt/financial assets ratio	Share of variable-rate loans	Debt service ratio	Composite risk indicator	Debt/GDP ratio (consolidated) <sup>(1)</sup>	Debt/equity ratio	Share of variable-rate loans	Debt service ratio	Composite risk indicator
Belgium	60.4	19.6	8.6	12.2	0.5	62.5	66.4	21.5	29.0	0.0
Germany	52.9	28.6	6.8	9.6	0.0	47.5	58.7	19.5	25.6	0.0
Spain	61.3	33.2	79.3	11.1	0.5	78.5	51.5	36.8	45.6	0.0
Finland	67.3	45.4	89.9	12.3	1.8	79.5	70.3	77.5	54.8	0.8
France	58.7	24.9	8.3	10.2	0.0	90.8	46.9	28.8	91.8	1.0
Greece	57.0	37.7	42.8	10.5	0.0	61.7	88.8	39.4	45.5	0.3
Euro area	58.1	27.2	31.2	10.7	0.0	76.8	60.9	33.0	51.5	0.0
Ireland	47.4	37.2	75.8	15.6	0.8	178.2	53.0	45.0	43.9	1.0
Italy	41.3	16.5	65.9	7.1	0.3	69.4	67.9	47.5	42.6	0.3
Netherlands	105.1	33.0	12.9	24.9	1.5	108.3	67.5	22.2	51.7	0.3
Portugal	69.4	33.7	83.9	11.0	0.8	94.2	82.6	51.6	63.8	1.3

Sources: ECB, NBB (own calculations).

Note: All data relate to 2017Q4 (in %). A white cell indicates a "no" risk (= 0), an orange cell indicates a "low" risk (= 1), a red cell indicates a "moderate" risk (= 2), and a dark red cell indicates a "high" risk (= 3). These categories were defined on the basis of threshold values that respectively correspond to the 65<sup>th</sup>, 80<sup>th</sup> and 90<sup>th</sup> percentile of the statistical distribution of each indicator across all the euro area countries and over time (period 1999Q1-2017Q4). The composite indicator was calculated as the average of the four discrete risk scores.

(1) The consolidated debt excludes loans between resident non-financial corporations from their total debt. In this article, where Belgium is concerned, loans granted by finance companies/holding companies and foreign non-financial corporations are also deducted since most of those loans – just like loans between resident companies – consist of intra-group borrowing.

For each indicator we determine a threshold value, indicating no risk (= 0), a low (= 1), moderate (= 2) or high (= 3) risk on the basis of the 65<sup>th</sup>, 80<sup>th</sup> and 90<sup>th</sup> percentiles respectively of the combined historical distribution of those indicators across all euro area countries. Next, we calculate a composite indicator as the average of the risk scores.

(1) Furthermore, as a result of refinancing, interest rate reductions may spread relatively quickly also in a market dominated by fixed-interest loans, but this is not the case in the event of an interest rate rise, which may accentuate the differences between countries with variable- and fixed-rate loans. However, the rise in the variable interest rate may be curbed by rules protecting borrowers, such as the interest rate cap system and the legal rule in Belgium, whereby the initial variable interest rate cannot be more than doubled.

In general, on the basis of the “heat map”, it seems that, in the euro area, households are currently more vulnerable than non-financial corporations. That is due mainly to their exposure (i.e. their relatively high debt ratio). The risk of a revision of rates (i.e. a relatively high percentage of variable-rate loans) varies little between households and non-financial corporations, and is therefore more country-specific.

In Belgium, households have relatively high debt ratios and DSRs, making them more vulnerable to an additional increase in the repayment burden as a result of an interest rate rise. On the other hand, the low percentage of variable-rate loans moderates the impact of an interest rate rise.

## Box 2 – Debt service ratios in the non-financial private sector

Debt service ratios (DSRs) provide important information on the interaction between debt and the real economy, since they tell us what percentage of disposable income goes to debt repayment (ratio of capital repayments and interest charges to income). A higher DSR means that there is a smaller proportion of income available for expenditure and saving, which may have real consequences.

In contrast to the debt ratio (outstanding debt in relation to GDP), the debt service ratio compares two flow variables, making it easier to interpret its value. In addition, that ratio explicitly takes account of changes in interest rates, thus providing a better view of the sustainability of a debt position. The level of the DSR depends on the disposable income, the outstanding debt, the implicit interest rate and the average maturity of outstanding debt<sup>(1)</sup>.

In this box, DSRs are calculated for households and non-financial corporations. DSRs are not directly available at the macroeconomic level, and various assumptions have to be made in order to calculate them<sup>(2)</sup>. Among the various components of the DSR, only outstanding debt<sup>(3)</sup>, income and interest payments are available in the national accounts. To calculate the DSR, it is therefore necessary to make assumptions about the average residual maturity and the form of repayment for outstanding loans.

For simplicity, we assume that debts are repaid according to a system of fixed monthly payments (capital redemption and interest payments), and that the average residual maturity of outstanding debt is stable.

The monthly repayment (M) can be calculated as follows:

$$M = S * \frac{i}{1 - (1 + i)^{-n}}$$

where:

$S$  = the total outstanding debt;

$i$  = the average interest rate on outstanding debt, expressed on a monthly basis;

$n$  = the average residual maturity of outstanding debt, in months.

The average interest rate on outstanding debt is based on the national accounts. More specifically, the interest payments include payments for the financial intermediation services indirectly measured (FISIM), i.e. the actual interest paid, which in the national accounts is divided into a reference interest rate and an interest margin (FISIM).

(1) It should be noted that the macroeconomic DSR may underestimate the average DSR at household level, since the denominator also includes the income of households without debt and no account is taken of distribution aspects.

(2) Among the international institutions, only the BIS publishes DSRs (Drehmann *et al.*, 2015). Our calculations differ from those of the BIS as regards the debt (NBB: debt adjusted for intra-group lending, BIS: total debt), and as regards the residual maturity (NBB: 10 years, BIS: 18 years for households and 13 years for non-financial corporations).

(3) Excluding intra-group loans in the case of non-financial corporations: at group level the repayment of those loans is neutral.

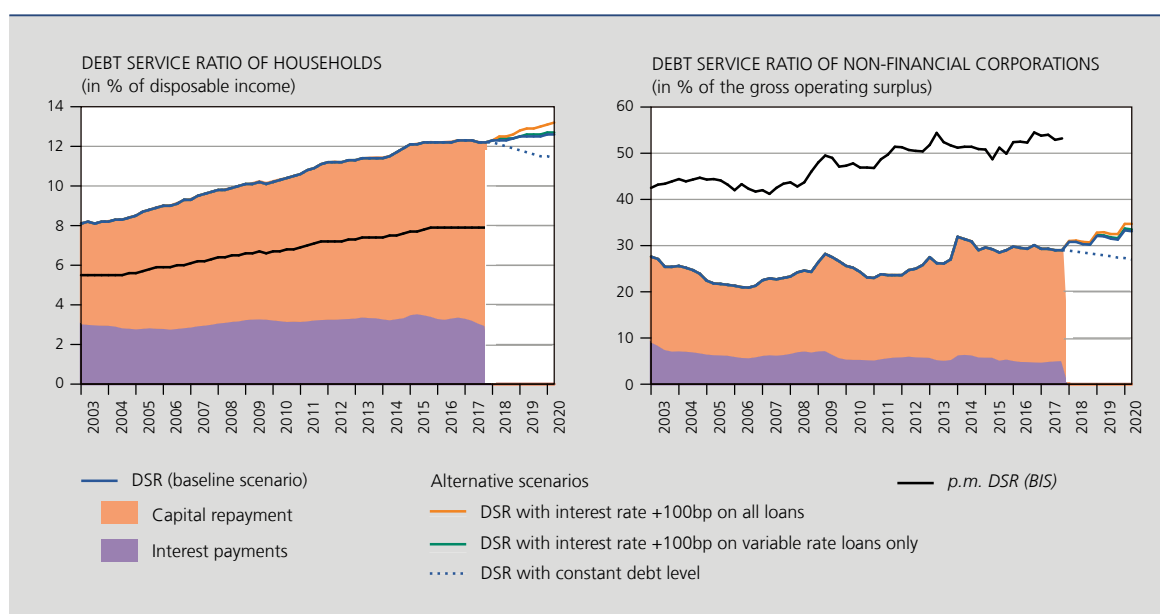


The implicit interest rate is obtained by dividing those interest payments by the outstanding debt<sup>(1)</sup>. In the case of both households and non-financial corporations, the average maturity is assumed to be ten years<sup>(2)</sup>.

The quarterly DSR is equal to the ratio between the repayment burden in a given quarter ( $M \times 3$ ) and the disposable income during that quarter. In view of the seasonal pattern of disposable income, the income in a given quarter is equalised to the average income over the past four quarters.

The DSR can be divided into an interest component and capital repayments<sup>(3)</sup>. It therefore lends itself to examining the direct impact of interest rate changes on the repayment burden. The DSR for Belgian households and firms is shown below, and compared with the BIS calculations (Drehmann *et al.*, 2015).

#### DEBT SERVICE RATIO FOR BELGIAN HOUSEHOLDS AND NON-FINANCIAL CORPORATIONS



Sources : BIS, NBB.

The DSRs for households and non-financial corporations as calculated by the NBB are respectively higher and lower than those estimated by the BIS. The higher DSR for households is due to the shorter maturity assumed for the outstanding debt (10 years instead of 18 years). In the case of corporations, the lower DSR is due mainly to the adjustment of the debt for intra-group loans.

Nonetheless, the trend in the household DSR is the same in both the NBB and the BIS figures. As already explained, the assumption about the maturity only affects the level of the DSR, and not its movement. For corporations, the profile differs. According to the BIS, the DSR maintains an upward trend over the period 2003-2017, whereas the NBB figures show it as stable. The difference is due mainly to intra-group loans, which rose sharply during the period considered.

(1) Another possible source for the average interest rate is the MIR survey. However, that survey only concerns bank loans and is therefore less relevant if the debt consists largely of non-bank credit (as in the case of businesses).

(2) The average maturity only influences the level of the DSR, not its movement.

(3) This breakdown is not published by the BIS.

To illustrate the sensitivity of the non-financial private sector's repayment burden to an interest rate rise in the current macroeconomic context, the impact of a 100-basis-point interest rate increase on the DSR over the period 2018Q1-2020Q2 is simulated mechanically, using the Bank's macroeconomic projections for disposable income and debt produced for the ESCB in the context of the BMPE<sup>(1)</sup>. It should be noted that these scenarios disregard endogenous effects of the interest rate shock on income or on the debt level.

We simulate four scenarios (see chart in box 2):

- Scenario 1 (blue): Baseline: BMPE projections for disposable income and debt, constant implicit interest rate;
- Scenario 2 (orange): Baseline +100-basis-point rise in the implicit interest rate over the projection horizon (10 basis points per quarter), applied to all loans;
- Scenario 3 (green): Baseline +100-basis-point rise in the implicit interest rate over the projection horizon (10 basis points per quarter), applied only to variable-rate loans;
- Scenario 4 (blue dotted line): baseline with constant debt level.

Scenario 1 reveals that the DSR of both households and firms is likely to rise further, owing to the projected credit expansion which exceeds the growth of disposable income and the gross operating surplus respectively.

The impact of the interest rate rise on the DSR is evident from the difference between scenarios 2 and 3 and the baseline. Scenario 4 shows how the DSR will change if only incomes rise; in other words, it indicates the denominator effect (fall in the DSR resulting from a rise in income), which becomes more likely the more the interest rate rise is due to a positive demand shock, as explained in section 2.1 of this article.

The simulations show that a 100-basis-point interest rate rise pushes up the DSR of households in Belgium by a maximum of 0.6 percentage point, and that of firms by 1.6 percentage points (scenario 2). Assuming that only variable-rate loans are repriced (scenario 3), the impact of the rate increase on the DSR in Belgium is reduced to 0.1 percentage point for households and 0.4 percentage point for firms.

Finally, scenario 4 shows that, with stabilisation of the debt level, the current macroeconomic projections for income may imply significant passive deleveraging.

All in all, these simulations indicate that the impact of an interest rate rise on the DSR of households and firms is small. While a higher interest rate does lead to a higher repayment burden, and for households the DSR is already relatively high, the practice of granting fixed-rate loans has some moderating effect. In the case of firms, the "heat map" showed that their initial position is less problematic, so that – even if the DSR were to rise by the maximum amount – their repayment capability would be under less stress than that of households.

As already mentioned, the above simulations and projections take no account of endogenous responses by the debt level and income (i.e. the debt ratio) to the interest rate shock. In so far as the debt ratio declines as a result of the interest rate rise, the upward effect of the rate rise on the DSR will be smaller than in the above simulations.

Hofmann and Peersman (2017a) point out that the DSR's response to an interest rate shock is in fact an empirical issue. Conceptually, the impact is unclear because it depends on both the response by the implicit interest rate and the response by the debt ratio.

The effect via the implicit interest rate is beyond dispute: a higher policy rate leads to a higher implicit interest rate. The size of the effect depends on the speed and intensity of the monetary transmission process, which in turn depends on the proportion of variable-rate loans.

(1) During a joint macroeconomic projection exercise (Broad Macroeconomic Projection Exercise or BMPE), central banks that are part of the Eurosystem produce projections for the most important macroeconomic aggregates on the basis of joint assumptions.

However, the effect via the debt ratio is unclear. According to the empirical literature (Bauer and Granziera, 2017; Hofmann and Peersman, 2017b), the credit volume generally falls more sharply than income, so that the debt ratio declines, more particularly in the medium term.

Hofmann and Peersman (2017a) conclude that an interest rate rise – in the event of a monetary policy shock – has a temporary significant and upward effect on the DSR. The higher policy rate leads to a higher implicit interest rate, and that effect exceeds the fall in the debt ratio. For a 100-basis-point shock, they find empirically that the maximum increase in the DSR is 0.4 percentage point<sup>(1)</sup>. In the medium term (from 12 quarters after the shock), there is, however, a downward effect on the DSR as a result of the further fall in the debt ratio.

Thus, in macroeconomic terms, an interest rate rise will tend to improve rather than impair the debt repayment capability in the medium term. That is an important finding, as according to some people, monetary policy is in a “debt trap” (Borio and Disyatat, 2014; Juselius *et al.*, 2017): the high debt deters central bankers from increasing interest rates owing to the detrimental effect on the DSR, which may lead to still higher debts. However, the empirical evidence shows that the impact on the DSR is modest, and that a tightening of monetary policy in the medium term actually fosters a lower DSR, so that from the point of view of debt sustainability, an interest rate rise may be beneficial.

### 3.4 How might banks’ deposit rates respond?

The key policy rate rises ought also to be reflected in an increase in the interest rates on assets held by the non-financial private sector. That would partly offset the higher interest charges for non-financial corporations, and especially for households, which hold substantial financial assets<sup>(2)</sup>. That transmission can be immediate and complete in the case of market instruments such as bonds. Conversely, the response of the interest rate on retail bank deposits is more uncertain. In the context of very low, or even negative, policy rates, the banks maintained their interest rate on retail deposits (particularly for households) above 0%. Sometimes, national regulations stipulate minimum rates for the interest on deposits<sup>(3)</sup>, further limiting the scope for banks to adjust their funding costs. Combined with the protracted period in which interest rates have remained at the lower bound, this may have depressed banks’ profitability<sup>(4)</sup>.

Recent experience has shown that the latest increases in the federal funds rate had hardly any impact on the remuneration of bank deposits in the United States. In April 2018, the 12-month deposit rate was roughly 16 basis points higher than in October 2015, whereas the federal funds rate increased by over 150 basis points in the same period, and the 12-month bond yield rose by 190 basis points. Other deposit interest rates displayed a similar picture. All in all, since the first interest rate hike following the crisis, namely in 2015, the transmission of the increase in the policy and market interest rates has amounted to between 10% and 30%. That contrasts with the picture for interest rates on mortgage loans, which closely track market rates (interest rates on 30-year loans increased by 64 basis points, compared to 75 basis points for the ten-year yields on government paper).

That is reminiscent of what happened in the United States after the Second World War. In an attempt to boost their profitability, the banks passed on less than 10% of the interest rate increases in their deposit rates, but 100% in their borrowing rates<sup>(5)</sup>.

In the early 2000s, Japan also experienced a long period of interest rates close to zero. The policy rate was raised in July 2006 and in February 2007 (by 30 and 35 basis points respectively). The interest rate on deposits held with Japanese banks reflected the first rise fairly closely, but incorporated hardly any of the second: overall, the deposit rate increased by 38 basis points (while the policy rate rose by 65 basis points). The transmission to the borrowing rate was also incomplete during that period, and shortly afterwards the policy rate was lowered.

(1) Note that this impact is somewhat smaller than in our simulations based on the BMPE projections, which disregard the endogenous impact of the interest rate rise on the debt ratio.

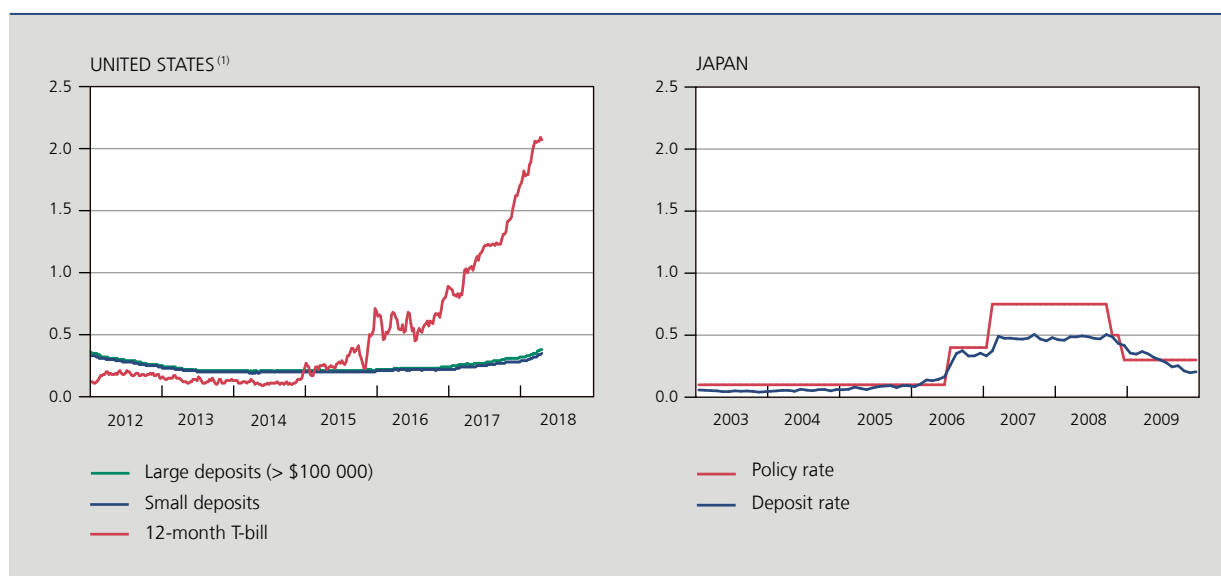
(2) At the end of 2017, bank deposits represented almost a third of households’ financial assets in the euro area, or 65% of GDP. In Belgium, the figure was 83% of GDP.

(3) In France, the rate applicable to a “livret A” – a special savings account with a ceiling – is revised by the government twice a year. In Belgium, the minimum rate on regulated savings deposits stood at 0.11%, namely a minimum basic rate of 0.01% and a minimum loyalty bonus of 0.10%, in June 2018.

(4) For more information on that mechanism, see de Sola Perea and Kasongo Kashama (2017).

(5) Estimated by Autonomous Research (2017).

**CHART 7** RETAIL DEPOSIT INTEREST RATES  
(in %)



Sources: Bank of Japan, FRED.  
(1) Interest rate on (1 year) term deposits with banks.

Various factors influence the expected impact of future rate increases on banks' profitability and may affect the transmission to the deposit rates (where a more rapid rise would reduce banks' net interest margin<sup>(1)</sup>).

Liquidity surpluses can have a two-fold effect. On the one hand, they reduce the incentive for banks to put up the interest rate in order to attract more deposits. On the other hand, the rise in the interest rate on the deposit facility to 0% and above may imply an increase in the net interest margin for banks that hold deposits with the Eurosystem. Those banks would therefore have more leeway for paying higher remuneration on retail deposits without detriment to their profitability. In recent years, banks in countries where the liquidity surpluses are concentrated have usually offered lower deposit interest rates (especially to firms).

More generally, maturity mismatches between assets and liabilities (which are also influenced by the proportion of liquidity surpluses that have a maturity of one day) may also affect the transmission to deposit interest rates. For banks, long-term assets, on which the interest rate cannot be revised immediately, and short-term liabilities (predominantly retail deposits) imply that an interest rate hike will reduce their net interest margin. Belgian banks, which have a high proportion of fixed-rate loans (granted at the time of low interest rates) and short-term deposits, could get into that situation. By postponing the rise in the deposit rate, the banks can avoid a deterioration in their net interest margins resulting from a complete and speedy transmission. Conversely, banks which hold mainly short-term assets (or assets at variable interest rates) could see an automatic increase in their net interest margins as a result of the rise in market interest rates. In their case, there could be less pressure to keep the deposit interest rates largely unchanged.

The funding structure also affects the impact of interest rate rises on profitability. Banks which are heavily dependent on retail deposits could be strongly inclined to keep the interest rate low and boost their net interest margin, since even small increases in the remuneration on deposits can imply significantly higher funding costs. At the same time, their dependence on deposits may imply that they are under greater pressure to raise the interest rate in order to avoid losing their principal source of funding.

(1) The need to increase the interest margin could also have an impact on the interest rate on new loans.

Banks which have used the targeted longer-term refinancing operations (TLTROs) as a source of funds could face an increase in their funding costs when those operations mature (between June 2020 and March 2021). That would put additional pressure on their net interest margins, which could prompt the banks to keep the deposit rate low for longer.

Retail deposits are generally regarded as a very stable and relatively cheap source of funding. They are the result of the relationship between the customer and the bank, a link which may extend beyond the deposit; they have a short maturity; and they are predominantly covered by deposit guarantee systems. Moreover, retail deposits receive favourable treatment in the regulations on bank liquidity<sup>(1)</sup>, so that the banks generally regard them as a very attractive method of financing<sup>(2)</sup>. The competition for retail deposits between banks may therefore have a major influence on the rates offered. Furthermore, that competition may have increased since the entry into force of two European Directives facilitating competition between banks<sup>(3)</sup>. New financial institutions based on new technologies (challenger banks, FinTech, etc.) may also become new rivals for the banks. All those factors could step up the pressure on banks to increase the remuneration on retail deposits as soon as market interest rates begin to rise.

## Conclusion

After remaining very low for a long period, interest rates are now expected to rise gradually in the euro area. The macroeconomic impact of that “normalisation” depends on the factors behind the interest rate rise. For example, if the rise is due to diminishing downward pressure on demand, then it will be accompanied by robust growth and inflation. Conversely, interest rate rises due to an unexpected tightening of monetary policy may have an adverse impact on the economy.

There are various factors suggesting that the next interest rate rise will differ from those in the past. The interaction with the non-standard monetary policy measures is one reason: reinvestment of the principal payments from maturing securities purchased by the central bank may continue to compress the term premium, even if interest rates are rising. For a given long-term target interest rate, that will enable the central bank to raise the short-term interest rate faster than it would without reinvestment. However, since that combination of measures tends to flatten the yield curve, it also risks blurring the signals given by the yield curve concerning the likelihood of an economic recession. At the same time, the central banks could incur losses on their portfolio of bonds acquired during the implementation of the asset purchase programmes.

Furthermore, the interest rate rise will take place in a context of high debt levels, which may have implications for financial stability. However, the effects could vary greatly, both across countries and between sectors. They depend in particular on balance sheet structures and the transmission of interest rate increases. Regarding the public sector, the differential between economic growth and interest rates is expected to remain exceptionally favourable. As for the non-financial private sector, the DSR could increase at first, but that effect will be weaker in the case of fixed-rate loans.

It remains an open question how the remuneration of bank savings deposits will develop following a rise in interest rates. While banks could try to maintain their deposit rates at low levels to improve their profitability, other factors, such as the greater ease with which households can transfer their deposits to other institutions or convert them into other forms of investment, may put pressure on banks to pass on the higher market interest rates in their deposit remuneration.

(1) A proportion of retail deposits is regarded as “stable” and has an estimated run-off risk of 5% in the calculation of the liquidity coverage ratio (LCR). For the “less stable” retail deposits, the risk is estimated at 10%. The LCR applies much higher run-off rates to other forms of financing (deposits by large firms or the government, interbank loans, etc.), namely between 25% and 100%.

(2) In contrast, in a period of negative market interest rates, retail deposits may be more expensive than other funding sources.

(3) Directive 2014/92/EU on payment accounts (applicable since September 2016) greatly simplified the procedures for switching to a different bank. Directive (EU) 2015/2366 on payment services (PSD2), in force since January 2018, could also boost the competition between payment service providers, and between those providers and the banks.

## Bibliography

Autonomous Research (2017), *European Banks rising rate chart book*, 14 February.

Bauer M. D. and Th. M. Mertens (2018), *Economic Forecasts with the Yield Curve*, FRBSF Economic Letter, 5 March.

Bauer G. and E. Granziera (2017), "Monetary policy, private debt and financial stability risks", *International Journal of Central Banking*, 13, 337-73.

Bonis, B., J. Ihrig and M. Wei (2017), "The Effect of the Federal Reserve's Securities Holdings on Longer-term Interest Rates", FEDS Notes. Washington: Board of Governors of the Federal Reserve System, April 20, 2017, <https://doi.org/10.17016/2380-7172.1977>.

Borio C. and P. Disyatat (2014), *Low interest rates and secular stagnation: is debt a missing link?*, VOX, June.

Cordemans N., M. Deroose, M. Kasongo Kashama and A. Stevens (2016), "The ABC of quantitative easing – Or the basics of asset purchases by central banks", NBB, *Economic Review*, June, 31-45.

De Backer B. and J. Wauters (2017), "The cyclical and structural determinants of the low interest rate environment", NBB, *Economic Review*, September, 75-94.

de Sola Perea M. and M. Kasongo Kashama (2017), "The negative interest rate policy in the euro area and the supply of bank loans", NBB, *Economic Review*, December, 45-65.

de Walque G., P. Jeanfils, T. Lejeune, Y. Rychalovska and R. Wouters, *An estimated two-country EA-US model with limited exchange rate pass-through*, NBB Working Paper series 317.

Dewachter H., L. Iania and J-C. Wijnandts (2016), *The Response of Euro Area Sovereign Spreads to the ECB Unconventional Monetary Policies*, NBB Working Paper 309.

Draghi M. (2018), *Introductory Statement*, 14 June.

Drehmann M., A. Illes, M. Juselius and M. Santos (2015), "How much income is used for debt payments? A new database for debt service ratios", BIS, *Quarterly Review*, September, 89-103.

Estrella A. (2005), *The Yield Curve as a Leading Indicator: Frequently Asked Questions*, Federal Reserve Bank of New York.

Greenwood, R. and D. Vayanos (2014): "Bond Supply and Excess Bond Returns", *Review of Financial Studies*, 27, 663-713.

Hofmann B. and G. Peersman (2017a), "Is there a debt service channel of monetary transmission?", BIS, *Quarterly Review*, December, 23-37.

Hofmann B. and G. Peersman (2017b), *Monetary policy transmission and trade-offs in the United States: old and new*, BIS, Working Papers, 649, July.

Johansson P. and A. Meldrum (2018), *Predicting recession probabilities using the slope of the yield curve*, FEDS Note, 1 March.

Juselius M., C. Borio, P. Disyatat and M. Drehmann (2017), "Monetary policy, the financial cycle and ultra-low interest rates", *International Journal of Central Banking*, 13(3), 55-90.

NBB (2018), *Corporate Report 2017*.



Taylor J. B. (1993), "Discretion versus Policy Rules in Practice", *Carnegie-Rochester Conference Series on Public Policy*, 39, 195-214.

Wheelock D. C. and M. E. Wohar (2009), "Can the term spread predict output growth and recessions? A survey of the literature", Federal Reserve Bank of St. Louis, *Review*, issue September, 419-440.

# The rise of the sharing economy

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G. Langenus

L. Walravens

## Introduction

The rapid technological developments are having an impact on the economy, particularly in modifying consumption methods. This article examines the so-called sharing economy. Apart from the strong growth of e-commerce, which has caused digital channels to become an integral part of the distribution chains, electronic platforms have emerged, which essentially link individuals with one another, offering them the opportunity to share goods or assets for which they have little or no use, without implying any transfer of ownership, and to exchange services. This “new economy” has recently gained importance such that it is now a real source of economic potential and opportunities meriting closer analysis.

In that regard, this article first attempts to define this new economy, as the literature contains numerous names for this form of consumption, ranging from the sharing economy to the digital economy and including the peer-to-peer economy and the collaborative economy. This study uses the first of those terms. Next, the article looks at the various factors which may explain the emergence – or rather, the expansion – of this form of economy, so as to gain a better understanding of its relatively rapid rise, and its future economic potential. In that respect, in order to assess how it will develop in the years ahead, it is vital to be able to estimate its current extent, notably in terms of activities, particularly in Europe and Belgium. Although this question is important, it is difficult to answer owing to the problem of defining its scope precisely and obtaining accurate statistics, but also in view of the current statistical accounting methods. The next part of the study describes how these activities are currently taken into account in the official statistics. The article also assesses to what extent the existing statistical methods need to be adjusted to ensure adequate coverage of these new forms of consumption and production. Finally, the article reviews the public policy implications of the sharing economy, as it has substantially increased competition on most markets where it exists. In fact, some concerns have already been raised recently, primarily in relation to the regulation that is required and the possibility that the sharing economy will merely oust conventional economic models via unfair competition.

## 1. Definition of the sharing economy

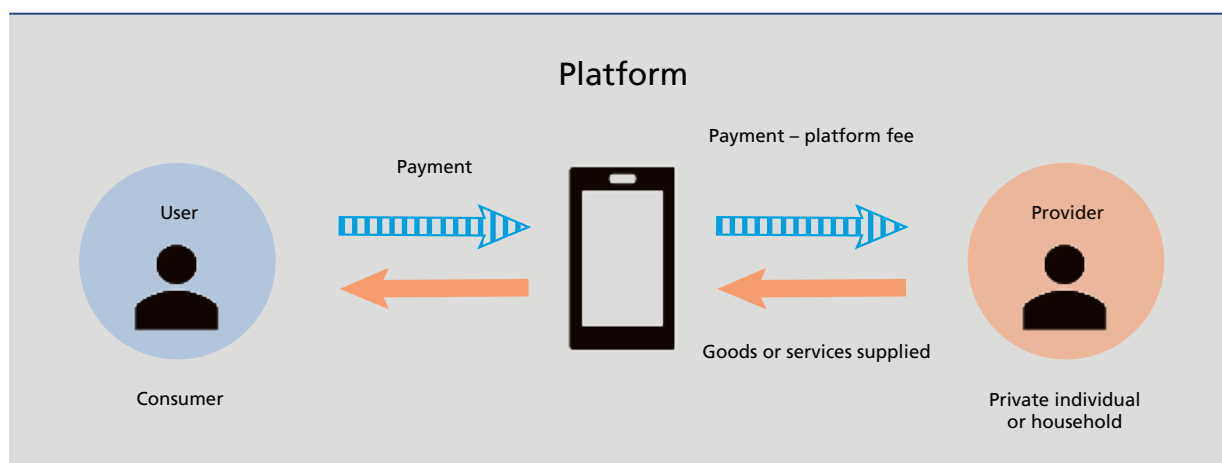
There is nothing new about the tendency to exchange and share goods or services such as cars, special tools, time or knowledge, but until recently these exchanges used to take place essentially on an informal basis, i.e. within the family, between friends or neighbours, or more generally, between acquaintances. However, the emergence and development of the digital economy, particularly the internet, has considerably widened the scope for the various

(\*) The authors are grateful to Lotte Van Mechelen for her valuable contribution on the statistical treatment of the sharing economy and for conducting the two case studies.

players to arrange these different types of exchange, as nowadays they can easily be effected between people who were previously total strangers, and can be organised more efficiently owing to cheaper information and logistics costs.

The literature and economic analyses concerning this new form of economy, stimulated by digital developments, use a wide range of names and definitions. The sharing economy, the collaborative economy, the digital economy, the circular economy, the peer-to-peer economy and the gig economy<sup>(1)</sup> are just some examples of the names regularly used in the economic literature and in the media. In reality, this plethora of terms reflects the difficulty of establishing a precise definition of this new method of exchange and trade in goods and services (Botsman, 2013). Although the definitions are not entirely interchangeable, they nevertheless have some aspects in common, as they concern activities facilitated by digital platforms which enable individuals to share or exchange goods, services, resources, or skills which were previously unused or under-used. In other words, the sharing economy matches demand to the supply of under-used assets or skills via intermediaries, with the aid of digital technologies, and does so with speed and efficiency, and on a large scale. It also enables consumers to become producers or micro-entrepreneurs and to contact one another, thus resulting in the disintermediation of many traditional activities. In most cases, these transactions do not entail any change of ownership<sup>(2)</sup>; platforms such as eBay, used for selling goods on line, including second-hand items, are therefore excluded. The definition of the sharing economy adopted in this study is also similar to the one used by Goudin (2016) in his report for the European Parliament, and by Beck *et al.* (2017).

**CHART 1** PEER-TO-PEER BUSINESS MODEL IN THE SHARING ECONOMY



This new form of economy encompasses a multiplicity of business models and a great variety of economic activities, ranging from the letting of a residential property (in whole or in part) to the booking of cars with drivers, or help with housework.

**TABLE 1** ECONOMIC SECTORS IN WHICH THE BUSINESS MODELS OF THE SHARING ECONOMY ARE USED

Sectors of activity	Examples of businesses/platforms
Transport	Uber, Lyft, BlaBlaCar, Click&Boat
Tourism and hotel industry	Airbnb, CouchSurfing, HomeExchange
Food	ShareTheMeal
Financial sector	KickStarter, Funding Circle
Services	TaskRabbit, WeTasker

(1) The term "gig economy" refers mainly to the repercussions of the sharing economy on the labour market, where increasing numbers of people carry out successive jobs via the platforms which have been developed to act as intermediaries between individuals for the purpose of those activities, but which do not actually have any direct employees. More generally, the term is linked to the expansion of self-employed activity, with work being regularly carried out for different employers.  
 (2) However, services may be accompanied by a transfer of intellectual property rights.

In the consumer-to-consumer business model, known as “c2c” (or “p2p” for peer-to-peer), demand and supply are matched via a digital platform developed and operated by a third entity who usually takes a percentage of the payment with each transaction. That is typically the case with platforms such as Airbnb and Uber, two major players in the sharing economy. Similarly, as a result of the strong growth of this type of business, more traditional commercial firms are also in the process of adapting their economic model to incorporate this concept of “sharing”. Although this type of business-to-consumer model (“b2c”) implies direct contact with the customers via its own app or platform, these activities are not included in the definition of the sharing economy used in this article, because these business models are relatively similar to those of traditional traders. For example, ZipCar which uses an app to provide a fleet of cars that can be “shared” by individuals is not fundamentally different from the service offered by a traditional car hire firm. One last point is that firms are gradually also realising the benefits of the principle of sharing with one another (be it software, office space or highly-specialised equipment). For example, the online platform Stockspots which recently began operating in Belgium now offers on-demand warehouse space for businesses.

Finally, even though the term sharing economy is becoming ever more widespread, there is some resistance to its use (Bardhi and Eckhardt, 2015). It might perhaps be more appropriate to call it the “renting economy” or the “access economy”, as the owners offering a property on Airbnb are not really sharing their home, but renting it out. Similarly, Uber is merely offering the hire of a vehicle with a driver in return for payment.

## 2. Factors behind the emergence and development of the sharing economy

As already stated, technological developments – and the advance of digitisation – are the driving force behind the emergence and rapid growth of sharing platforms. However, increasing urbanisation and growing environmental awareness are also decisive factors. Finally, financial motives may likewise be contributing to this development, both among consumers and among suppliers of goods or services.

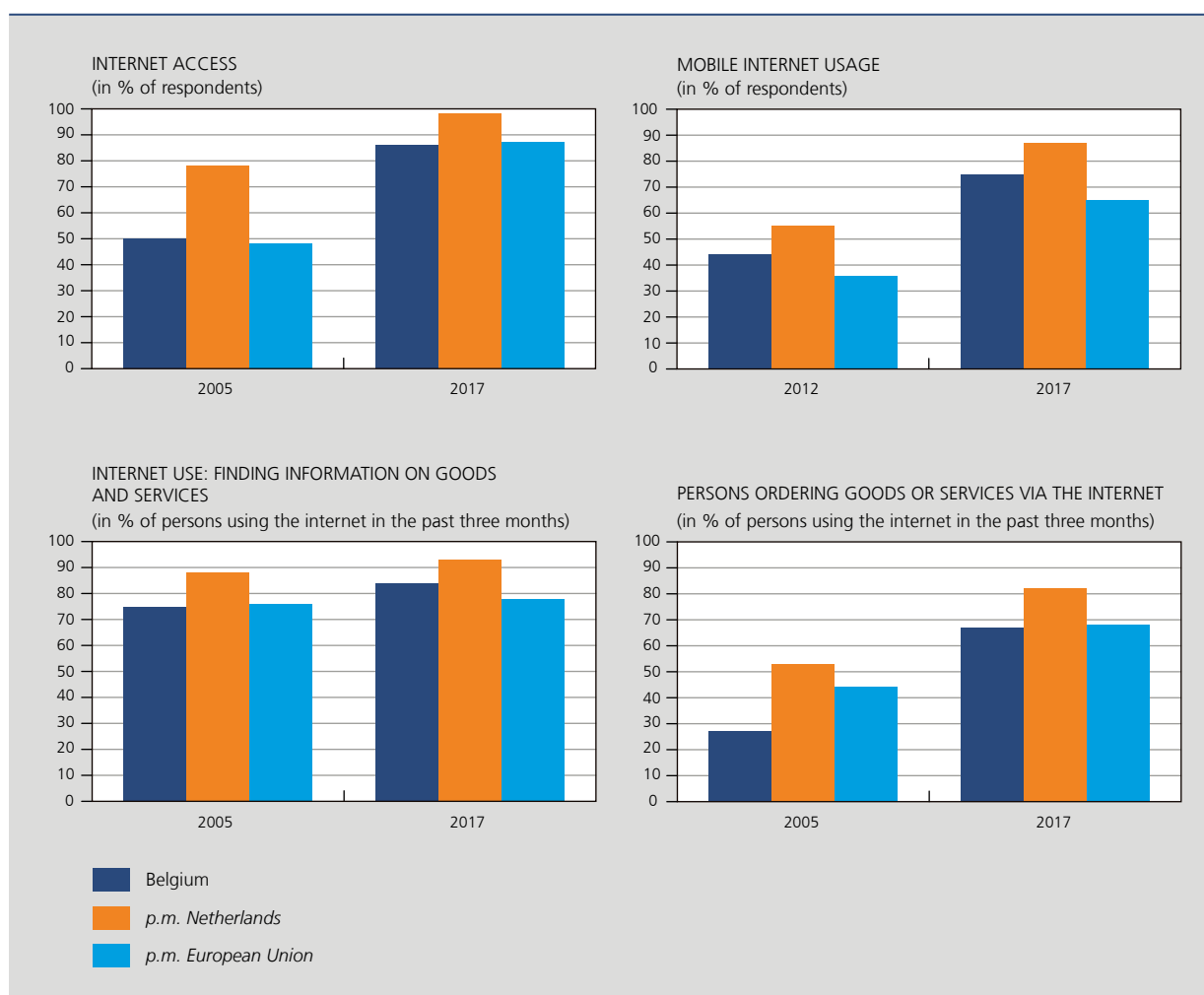
### 2.1 Digitisation

Many studies (Coyle, 2016) have shown that the sharing economy offers a quick and cheap way of matching supply with demand for goods and services. The main innovation in the business model of the sharing economy lies in the technological platforms and mobile apps which bring demand and supply together and group them in a way which was not possible before (quicker, cheaper and on a bigger scale), including in geographical areas or services sectors where the concentration of players is lower and where new commercial opportunities are now arising. Use of the internet makes it easier to carry out transactions by connecting those offering assets or services with those who wish to use them, and it does so on a large scale with instant matching. Today, the success of sharing businesses depends very much on this ability to make a material asset or service available to others efficiently, whether or not in return for payment.

The internet is therefore crucial to the development of the sharing economy. In that respect, measured according to the Digital Economy and Society Index (DESI)<sup>(1)</sup>, Belgium was ranked sixth in Europe in 2017, with particularly high scores for connectivity and the integration of digital technology by firms aiming to boost their productivity and sales. Eurostat figures also show that the internet is widespread in Belgium: around 86 % of the population had internet access in 2017. Similarly, 75 % of the population used mobile devices such as laptops and smartphones to consult the internet when on the move. Furthermore, rapid search options are increasingly being used to obtain and compare information on goods and services online, often resulting in an online purchase. In fact, 67 % of internet users report having purchased at least one item online in the past year. Although Belgium is not yet doing as well as its neighbour the Netherlands, for example, it nevertheless scores well above the EU average. In principle, these factors create the ideal conditions for the emergence and rapid expansion of new online commercial players, such as the sharing platforms. Lobel (2016) also points out that the sharing platforms become more efficient the more people use them, since the probability of a match between supply and demand increases, bringing a further decline in transaction costs. That could also explain why the sharing economy can achieve exponential growth, particularly in its initial development phase.

(1) DESI is a composite index that summarises relevant indicators on Europe's digital performance and tracks the digital competitiveness of the EU Member States.

**CHART 2** INDICATORS FOR USE OF THE INTERNET AND THE NEW TECHNOLOGIES



Source: Eurostat.

Note: This chart makes a comparison with the Netherlands because that is the EU country that scores highest for (almost) all the indicators considered.

## 2.2 Urbanisation

Apart from the said technological developments, increasing urbanisation has also made it possible to bring together a critical number of economic actors in order to develop shared activities. The concentration of people living in close proximity has indeed expanded the opportunities for exchanging a number of activities in the sharing economy, although digital progress has likewise facilitated contact between players located farther apart. Davidson and Infranca (2016) even assert that many of the initiatives in the sharing economy offer a specific response to the frustrations of living in a busy city. In fact, city dwellers can now avoid having to buy a car (and thus avoid the associated parking problems) by car-pooling or hiring a car with a driver.

## 2.3 Values (and eco-citizenship)

Similarly, cultural values and social norms have changed, and encourage the development of activities in the sharing economy. First, environmental considerations raised the question of use of resources and individual ownership of specific assets, favouring the development of a new form of consumption. In that connection, an ING survey (2015) shows that many consumers think that the sharing economy is beneficial. For instance, 43 % of the 1 000 Belgians polled agree with

the statement that the sharing economy is good for the environment. Moreover, 36 % of Belgian respondents consider that the sharing economy strengthens communities.

As stated by Bardhi and Eckhardt (2017), the current generation attaches greater importance to experiences and quick access, rather than actual ownership. They see that as a new phenomenon within changing consumer behaviour, especially among the younger generations: “liquid consumption”, based on principles such as flexibility, transience, detachment and speed. In a way, this phenomenon was already predicted in 2000 by Rifkin, who stated that the traditional ownership economy would ultimately give way to a user economy (the age of access), in which just-in-time access to goods and services would be preferred to ownership. Rifkin also predicted that all (free) time and experiences would be offered for sale.

This ties in with the fact that increasing numbers of people are now prepared to share their possessions with strangers. According to a survey conducted by Nielsen (2014), 54 % of European consumers are willing to share their own goods, while 44 % are willing to use other people’s belongings. Electronic equipment, bicycles or vehicles, sports equipment and tools are the goods that most people are prepared to share. However, that is not fortuitous, as these are typically goods that generally come with a high purchase price and are often under-used (or even not used at all). Although willingness to share is particularly marked among millennials, earlier generations also seem willing to follow the trend. Nonetheless, Europe still lags somewhat behind in this respect. At global level, an average of 60 % of the total of 30 000 respondents state that they are willing to share their goods with others.

Moreover, the willingness to share one’s belongings with strangers is not so much a question of trust as an additional consequence of increasing digitisation, which has permitted the creation of online reputation and rating systems (Bergh and Funcke, 2016). As a result, in the eyes of consumers, the risks inherent in sharing are lower.

**CHART 3** TRENDS UNDERLYING THE DEVELOPMENT OF THE SHARING ECONOMY



## 2.4 Financial motives

Apart from altruistic motives, financial aspects undoubtedly play a key role in the emergence of this type of economy. According to the 2015 ING survey, a large proportion (48 %) of Belgian respondents stated that their main reason for participating in the sharing economy was to earn money or to save money. De Coen and Vanoeteren (2017) arrived at a comparable figure of 46 % for a sub-group of Flemish consumers.

Similarly, the literature states that the financial aspect is the main incentive for participating in this type of transactions (Schor and Attwood-Charles, 2017). Use of the sharing economy may in fact make sense in economic terms, on the one hand because individuals avoid the need to invest in expensive items which are seldom used, while on the other, they can boost their income by “hiring out” under-used goods (Lobel, 2016). What is more, users (consumers) benefit from lower prices, one reason being that the platforms reduce transaction costs and do not require a significant marketing budget (Schor and Attwood-Charles, 2017). Just as goods are shared on line, opinions are also exchanged on the web. In that regard, the survey by Nielsen (2015) demonstrates the power of publicity by word of mouth. Thus, no fewer than 78 % of European respondents attach considerable importance to the recommendations of friends and family. A smaller proportion of those polled, though still 60 %, also pay attention to the opinions expressed online by consumers unknown to them. Consequently, people place far more trust in those opinions than in traditional advertisements on television or in newspapers and magazines.

### 3. Economic importance of the sharing economy

The various factors mentioned above have led to the rise of activities in the sharing economy over recent years. This section aims to determine the scale of these activities in general terms. However, that is difficult owing to the considerable number of (new) challenges to be addressed in order to arrive at an accurate assessment. The main challenges in terms of methodology and statistics hampering this analysis of the sharing economy’s weight in the economy as a whole are discussed in a separate section of this article (see section 4).

#### 3.1 Vigorous growth worldwide

Quantitative data on the scale of the activities of the sharing economy across the world are relatively scarce and limited. Nonetheless, the existing studies indicate that those activities have expanded considerably in recent years.

For instance, according to a study by PricewaterhouseCoopers (PwC) published in 2016, the value of the transactions and revenues of sharing platforms in Europe amounted to € 28.1 billion and € 3.6 billion respectively in 2015, and had more than doubled since 2013. However, despite this rapid growth, the impact of these platforms on the total economy is still relatively small so far. In fact, the figure of € 28.1 billion recorded for transactions in 2015 only represents around 0.35 % of the total final consumption expenditure of European households in that year.

The growth of platform revenues is attributable mainly to activities relating to accommodation and transport, which expanded considerably between 2013 and 2015. Moreover, that is in line with the valuation of the two main companies active in those services transactions (namely Uber and Airbnb), which quadrupled and tripled respectively between 2014 and 2016 (PwC, 2016). There has been equally dramatic growth in the number of searches worldwide concerning these two best-known platforms. Data collected by Google Trends show how interest in these two companies has grown exponentially since 2011. Unsurprisingly, the number of searches targeting Airbnb also displays a clearly seasonal profile: in fact, interest in short-term accommodation systematically peaks in the summer months before subsiding in the autumn.

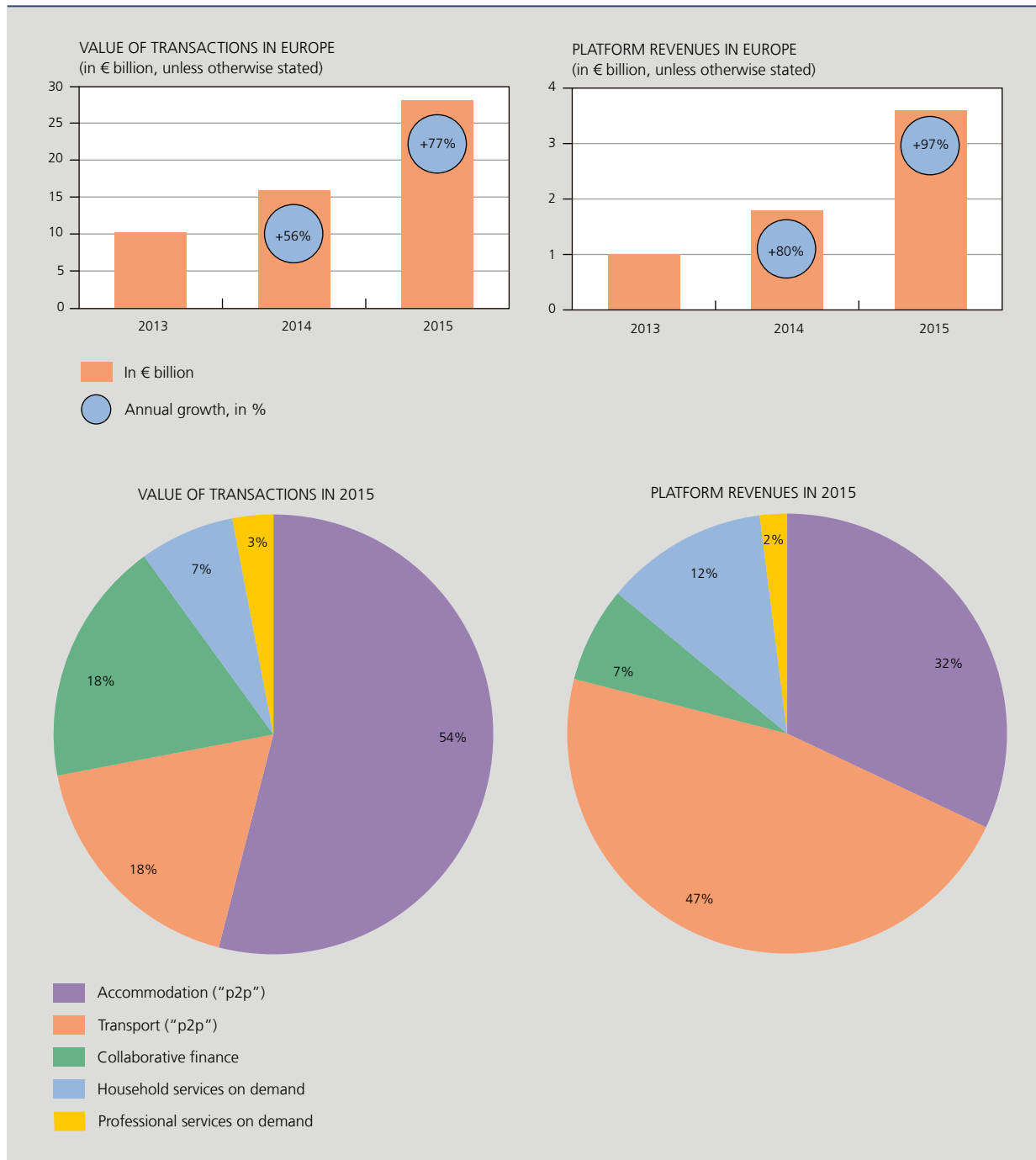
An exploratory study by the European Commission (EC, 2017) on “p2p” platforms also confirms the expansion of the sharing economy in Europe. Thus, according to this study there were around 485 “p2p” platforms active in Europe (+ Norway) in 2016 (from March to December 2016), of which 4 % were extremely significant with over 100 000 visitors a day. 323 of these online platforms (i.e. 67 % of the total) are directly classified as platforms relating to the sharing economy<sup>(1)(2)</sup>.

(1) Of the 485 platforms identified in this study, only three (Airbnb, Uber and eBay) are established outside the EU and Norway. Nevertheless, they are included in the EC study on account of their popularity and because they have a registered office in an EU country (Ireland in the case of Airbnb and the UK for Uber and eBay).

(2) The EC study covers five “p2p” sectors of activity. According to the EC’s definition, only the last four form part of the sharing economy:

- (re)sale goods: platforms used to for selling goods to or buying goods from other persons (e.g. Kapaza in Belgium).
- sharing/renting goods: platforms used for sharing goods and renting them to other persons (e.g. Peerby in the Netherlands).
- sharing/renting accommodation: platforms used for sharing accommodation or renting it to other persons (e.g. Airbnb).
- sharing/hiring rides: platforms used for sharing vehicles or hiring vehicles from other persons (e.g. Uber, BlaBlaCar in France).
- odd jobs: platforms used for recruiting non-professionals for the provision of personal services (e.g. tourist guide services).

**CHART 4** VALUE OF TRANSACTIONS AND REVENUES OF SHARING ECONOMY PLATFORMS IN EUROPE (2013-2015) AND THEIR BREAKDOWN IN 2015



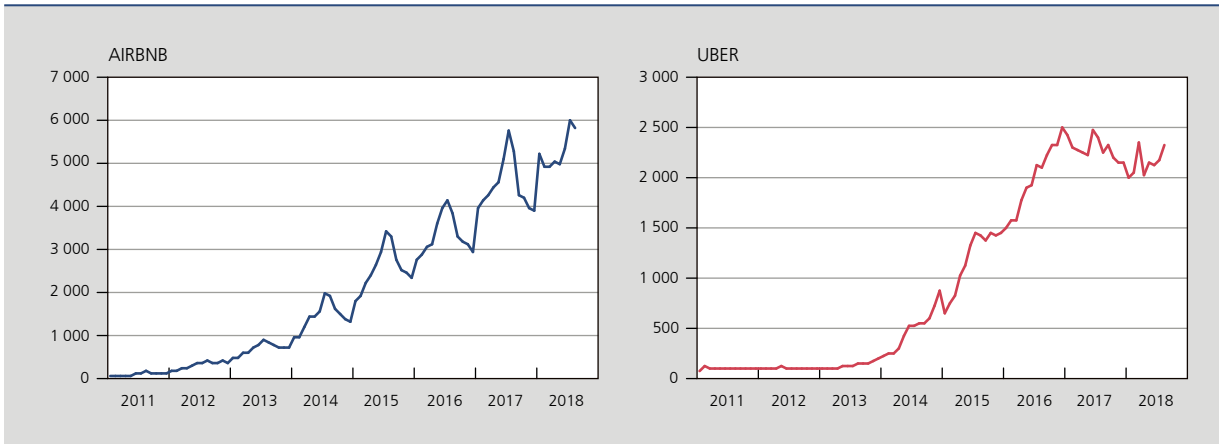
Source: PwC (2016).

Nevertheless, these digital platforms are less prominent in the European economic landscape than elsewhere in the world, as indicated, for instance, by a study on their worldwide development (Evans and Gawer, 2016)<sup>(1)</sup>. In fact, be it in terms of number, market value or number of workers employed, the European platforms identified by this study make up only a small percentage of the total. In geographical terms, the digital platforms considered actually seem

(1) However, the digital platforms discussed in this study cover a broader spectrum than our definition of the sharing economy. In particular, they include a number of e-commerce platforms such as eBay and Amazon, which are not captured by the definition used in this article.



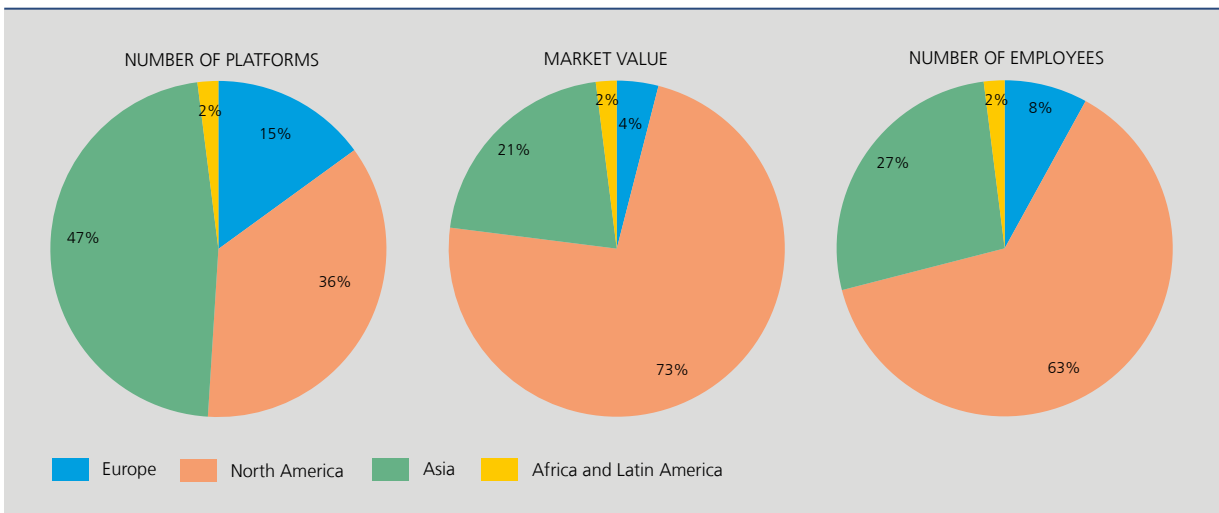
**CHART 5** SEARCHES TARGETING AIRBNB AND UBER WORLDWIDE  
(monthly data, indices, average 2011 = 100)



Source: Google Trends.

to be located mainly in Asia (47%) rather than in North America (36%) and Europe (15%). Moreover, their market capitalisation seems to be much greater in North America (73%) than in Europe (4.2%), despite the extent to which such service platforms are used in Europe.

**CHART 6** PLATFORMS OF DIGITAL INTERMEDIARIES ACROSS THE WORLD  
(in % of the total number of platforms identified)



Source: own calculations based on Evans and Gawer (2016).

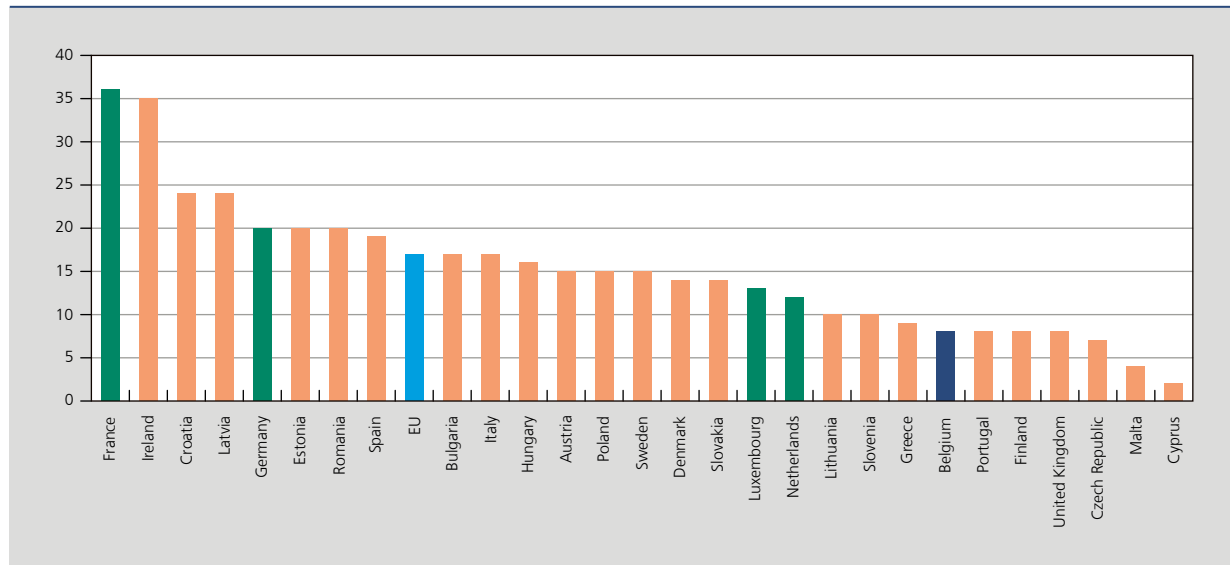
### 3.2 Focus on Belgium

The aforesaid study by PwC (2016) also revealed that more than 275 collaborative organisations had been set up in the nine European countries considered<sup>(1)</sup>. Most of them were based in France and the UK, with each of those two countries having over 50 companies. In Belgium, fewer than 25 collaborative businesses have been created. This finding, which indicates that Belgium is not in the forefront of European development of activities in the sharing economy,

(1) Belgium, Germany, France, Italy, Poland, Spain, Sweden, Netherlands and UK.

was also demonstrated by a survey conducted by the European Commission (EC, 2016). According to that survey on the use of platforms in the collaborative economy in Europe, only around 8 % of the Belgian population had participated in a form of the sharing economy, well below the participation rate seen in the four neighbouring countries. Belgium's participation is actually below the average for Europe, where almost 17 % of the approximately 14 000 people polled have used such platforms. Moreover, around a third of the European respondents who had used the services of these digital platforms had also provided a service at least once. That therefore suggests that the users of this new form of economy act both as consumers and as service providers.

**CHART 7** USE OF A SHARING ECONOMY PLATFORM  
(in %)



Source: EC Flash Eurobarometer 438 (2016) – The use of collaborative platforms.

In Belgium as in other European countries, those participating in this form of economy tend to be relatively young, well-educated urban dwellers. Their main reasons for using this form of economy seem to be concern for the environment or the wish to save money, motives which tally perfectly with the factors previously cited as the basis for the emergence and development of the sharing economy worldwide.

The prospects appear to be quite favourable, since 25 % of those polled in this study stated that in future years they were likely to participate in the sharing economy to a greater degree than at present. In addition, although Belgians' rate of participation in the sharing economy is still low, an ING study (2016) draws attention to the growth potential. Thus, according to the ING International Study, in early 2015, around 24 % of Belgians were familiar with the expression "sharing economy". A new poll conducted during 2016 revealed that the term was rapidly gaining acceptance, and that a third of those polled now gave a positive reply.

In this connection, on the basis of a survey of users of digital platforms linked to the sharing economy, a report by PwC (2018) estimated that the turnover of the sharing economy came to around € 2 billion in Belgium in 2017, or 0.5 % of Belgian GDP. Services to households and businesses accounted for the biggest share of that figure (25 %), followed by "accommodation" and "transport" which each represented 20 %. The rest was made up of platforms for "machines", "media and entertainment", and "retail and consumption goods".

### 3.3 Growing importance in the future?

Although the sharing economy is currently still small compared to the economy as a whole, its recent rapid growth suggests that this phenomenon will persist in the future.

An estimate by PwC (2014) covering five key sectors of the sharing economy found that the revenue generated worldwide came to around \$ 15 billion in 2013, and was expected to reach around \$ 335 billion in 2025. This would put the incomes of players involved in activities of the sharing economy on a level comparable to that of the traditional players in the rental market (such as car hire companies, B&Bs, etc.). In the study which he conducted for the European Parliament, Goudin (2016) is even more optimistic, estimating at € 572 billion the potential future value of annual European consumption relating to the sharing economy. However, he repeatedly points out that this amount is a theoretical maximum which could only be achieved in ideal circumstances.

Similarly, the PwC study warns that a number of major challenges are emerging (concerning regulation and public opinion) which could halt the growth of the sharing economy (see section 5 of this study).

## 4. Capturing (the scale of) the sharing economy in the official statistics and the potential implications for economic analysis

Correct recording of the sharing economy, and in broader terms the digital economy, in the official statistics (value added, incomes, prices, employment, etc.) is essential since, as described in the previous section, these activities seem to have gained importance during the past decade. The question is therefore whether the existing statistical methods and the current method of collecting the data take proper account of these sharing economy activities.

This section aims to address the implications of the emergence and development of the sharing economy activities for the current statistical series and for a country's economic indicators, to identify how these activities are included and, if they are even partially missing, to discuss the current methodological considerations in order to gain a better understanding of these activities<sup>(1)</sup>.

### 4.1 GDP and components in the national accounts

As regards the national accounts, there are still many statistical challenges to be resolved in order to measure and identify the sharing economy as a whole. Major challenges include the classification of these activities in existing or future statistical nomenclatures, the need to be able to identify transactions effected between consumers/households, and the feasibility of measuring non-monetary transactions.

In practice, some activities in the sharing economy are not fully recorded at present in the official statistics such as GDP, since the concept only measures transactions within what is called the production boundary. The reason is that current calculation methods are based on the traditional assumption that firms create value added as producers, while households/individuals are only consumers (or investors, where housing is concerned). As already stated, increasing numbers of individuals now participate directly as “producers” in activities relating to the sharing economy. The role of households as producers was previously limited, and the value added that they create is currently recorded in the national accounts via estimates of the informal economy. With ever more households offering goods or services in the sharing economy, thereby creating value added, the production boundary is liable to become blurred (Bean, 2016). This problem is an intrinsic element of the still broader discussion on GDP as a way of measuring wealth. In that connection, Coyle (2016) states that the impact of the sharing economy on the current statistics could even be negative, for example because the shared use of motor vehicles between individuals could mean that fewer people buy their own car. Nonetheless, that recorded decline in consumption need not imply a loss of wealth. Moreover, the efficiency gains and the time saved by the use of digital applications in the broad sense, and therefore also the sharing economy platforms, are not currently included – at least not in full – in the calculation of GDP.

(1) It should be noted that, in participating in various working groups at international institutions, the National Bank of Belgium's Statistics Department takes part in the ongoing discussions on this subject. For instance, in 2017, Eurostat set up a task force on measuring the prices and volumes of services activities. Among other things, the task force warned against the potential bias due to the introduction of new digital services, and recommended that each case be assessed individually. In practice, the sharing economy is not yet taken into account as such in Belgium's CPI or in the HICP, because it is unclear how much weight should be attributed to those prices. Eurostat needs to issue more specific guidelines on this subject. Also, in 2016, an informal discussion group on measuring GDP in a digital economy was set up by the OECD's Committee on Statistics and Statistical Policy (CSSP) in order to tackle the measurement problems posed by the digital economy. At a meeting of the UNECE Group of Experts on National Accounts held in May 2018, an initial proposal was put forward for creating a satellite account for the digital economy in the national accounts. That would permit the clear identification of digital transactions and, if necessary, could ensure that large transactions are duly recorded. However, the discussions on such a satellite account are still at a very early stage.

Leaving aside the discussion on what GDP is meant to measure, statisticians nowadays also have to contend with incomplete administrative sources relating to (the scale of) the sharing economy. As mentioned in an earlier section, the complexity of defining and delineating the activities of the sharing economy makes it even more difficult to capture them in the official statistics. Although some national accounts classifications<sup>(1)</sup> already contain categories concerning information and communication technologies, they do not provide a complete picture of the sharing economy platforms, the activities of which are classified in other economic sectors<sup>(2)</sup>. That is illustrated in the box by two practical case studies on the statistical treatment of Airbnb and Uber. These two platforms are not only the best examples (or pioneers) of the sharing economy: being very different from one another, they also lend themselves perfectly to a discussion of the statistical treatment of activities in this form of economy.

### Box: Case studies – Uber and Airbnb

Since 2012, Uber has also been operating in Belgium in the form of a private limited company. Consequently, the firm has to submit detailed annual accounts to the National Bank of Belgium's Central Balance Sheet Office. These data can be readily consulted and reveal, for instance, that this firm employed eleven full-time equivalents (FTEs) in Belgium in 2016 and generated value added amounting to around € 2.2 million.

Nonetheless, since the Uber drivers are self-employed, they are not direct employees of this platform. In Belgium, these drivers are in fact required to register for VAT; in that respect, they are no different from a traditional, self-employed taxi driver. Although the value added that Uber drivers create is duly included in the national accounts via their VAT figures, it cannot be separated from the total, as there is no distinct classification. The case of Airbnb is even less clear. Although this platform also operates in Belgium, there is no subsidiary registered in Belgium so that the company does not file any annual accounts here. Of course, there are certain registration obligations that apply to rooms or accommodation offered for rent via the digital platform, but once again, the offer via a sharing platform cannot be entirely separated from traditional forms of supply. In any case, the statistical authority has no single, centralised database. In other words, the known administrative data are insufficient, and the significance of this platform can only be estimated via information obtained from the media or on the basis of certain assumptions concerning the number of overnight stays recorded in the sharing economy and the average price charged. Moreover, if it is (part of) the accommodation occupied by the owner that is rented out, an adjustment should be made to take account of the production attributed to homeowners (the "notional rental value") in the national accounts. Owing to the great uncertainty surrounding such assumptions (and indications that the Airbnb platform is currently of negligible significance in comparison with the total Belgian GDP), the National Accounts Institute has opted at this stage not to include Airbnb in the estimates of GDP and awaits more formal guidelines from Eurostat. It seems that, at present, only a few OECD countries are capable of capturing activities concerning the rental of property via digital platforms in their surveys.

As demonstrated by the analysis in the box, it is possible that the current national accounts statistics, to which the GDP estimation pertains, do not record completely the activities of property rental platforms or transport platforms in Belgium, so that those activities are only partly taken into account, if at all. Also, the intermediation incomes generated by transactions effected via these digital platforms are still extremely difficult to measure and to take into account.

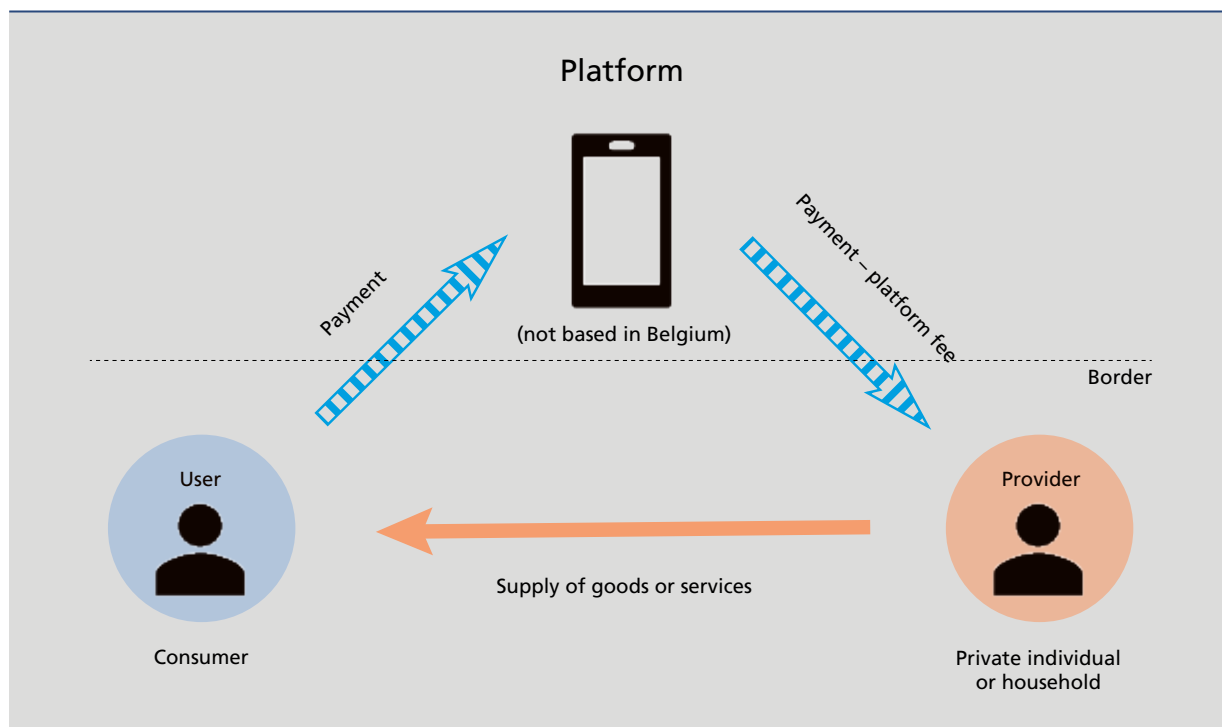
However, Bean (2016) points out that the problem does not exist solely as regards total GDP, but also at the level of its sub-division into demand components. In the example of a car bought to provide services via Uber, the question is whether that acquisition forms part of household purchases of consumer durables, or whether it should be classified, at least partially, as a business investment.

(1) For example, the latest version of the United Nations International Standard Industrial Classification (ISIC), the Central Product Classification (CPC), and the European Communities statistical nomenclature of economic activities (NACE).

(2) Uber's activities are classified under NACE 52.29 "Other transportation support activities".

Finally, the digitisation of the economy and the rise of sharing economy activities have also facilitated cross-border transactions, and that similarly has implications for the external statistics. Those statistics ought to include transactions which can take place via platforms located outside the borders of the national economy. As in the case of Airbnb, the platform where the user can contact the hirer may be located abroad.

**CHART 8** EXAMPLE OF TRANSACTIONS INVOLVING INTERNATIONAL FLOWS



## 4.2 Prices and deflators

The problems of accurately measuring activities relating to the sharing economy and the associated incomes also arise when it comes to measuring prices, and hence the price indices useful for calculating the GDP deflator and other inflation measures. As already mentioned, the digitisation of the economy and the emergence of digital platforms have led to increased price competition on the market in goods and services, and the prices charged there are usually lower than in more traditional shops. This digitisation of the economy, and hence the development of the sharing economy activities, implies that the basket of goods used to calculate the consumer price index could contain a product weighting which no longer offers a complete and correct reflection of reality.

More generally, the emergence of e-commerce platforms, which usually offer products at lower prices, has changed people's consumption patterns so that they should now be fully included in the calculation of the price indices. New techniques, such as web-scraping, may prove useful or necessary for incorporating these data properly in the consumer price index.

In practice, certain measurement problems could arise. For instance, new goods are not included immediately in the basket of products that determines the consumer price index, because the index is not constantly updated. For example, the prices of the Netflix streaming service were only included in the basket of products from 2018, whereas that service has been available in Belgium since 2014. A further difficulty concerning digital goods and services also relates to the assessment of their quality. The price index is deemed to reflect prices for a constant quality so that, where the quality improves, the corresponding price index needs to be revised downwards. Finally, there is still the question of free online goods (such as newspapers or open-source software): in theory, they should likewise be reflected in the price index (Itkonen, 2017).

Furthermore, if the use of sharing economy platforms becomes an everyday reality, the calculation of the price indices must also take better account of that. If the use of services via sharing economy models takes over from traditional services – as in the case of Uber versus traditional taxis – then the price indices should reflect that change and the associated price differences. Nonetheless, the prices of some activities in the sharing economy are not currently reflected in the consumer price index. For instance, that index does not currently take account of transactions between individuals (Coyle, 2016). The scale of that omission or partial recording in the statistics nevertheless depends essentially on the significance of the sharing economy activities in the economy of the country in question.

### 4.3 Next steps

In the future, in order to evaluate the sharing economy on the basis of the national accounts, more data will be needed. However, before progressing to new methods of data collection and/or processing, we must first think about the conceptual aspects.

Digitisation undeniably leads to a shift in the production boundary, with more activities taking place within the household rather than via a third party (e.g. mobile banking services or online travel booking). The advent of the sharing economy makes that shift explicit. These “p2p” transactions should also be included in the official statistics (both in GDP and in the price index). Itkonen (2017) advocates using an “extended GDP concept” for that purpose.

In order to collect and analyse detailed data, a separate classification is needed for the platforms themselves, to permit differentiation between sharing economy activities and more traditional activities. Furthermore, it is not obvious how to treat platforms which do not file annual accounts in Belgium, even if part of their value added is actually produced there. It may be necessary to exchange more data internationally.

In the case of households, more information could be collected via surveys. For example, the labour force survey (LFS) could be used to check the extent to which people are active as suppliers of goods or services on sharing economy platforms. In the United States, for instance, an annex was added to these surveys in May 2017 with questions addressed to contingent workers, i.e. people who only expect their job to be temporary. That proved to be the case for 3.8% of people polled, slightly below the figure of 4.1% recorded in the previous edition of that survey in 2005<sup>(1)</sup>. In the new edition, four extra questions were added. In particular, they try to identify the number of people accepting short-term jobs via mobile apps or websites. However, the results have not yet been published.

## 5. Policy implications of the sharing economy

The sharing economy appears to be rapidly expanding and the opportunities are legion; nonetheless, there are still some major challenges ahead. On the one hand, online platforms and the new way of working that they imply are eliciting a great deal of protest from traditional players (incumbents), who often regard these new players as a form of unfair competition. Also, there is a risk that the continued growth of activities relating to these platforms will be undermined by opposition “from within”: for example, there has already been much discussion in the media about some of the drawbacks of these platforms for workers or neighbours. Finally, governments do not yet appear to be entirely ready to provide proper support for these new players, i.e. by means of appropriate guidance and regulation.

### 5.1 Protests from traditional players

In some sectors, the incumbents clearly feel what they call the adverse impact of the advent of sharing platforms. In particular, taxi drivers and hotel owners have already repeatedly expressed their concern that their competitors in the sharing economy do not (and need not) comply with the same regulatory framework. However, as already mentioned, the sharing economy is set to continue expanding rapidly in the coming years. According to an estimate by PwC (2014), the market value of the sharing economy as a whole may rise extremely rapidly in the next ten years to twenty times

(1) Although the decline in the number of contingent workers since 2005 seems at odds with the rising proportion of short-term jobs in the sharing economy, it should probably not be interpreted in that way, as this question is addressed only to workers who consider this (temporary) job as their primary income source. As mentioned later on in section 5.2.1, that only applies to a quarter of those offering goods or services in the sharing economy.

its current value, and would thus attain much the same estimated size as the “traditional” market, which is growing far more slowly.

According to Enders *et al.* (2015), traditional players made a mistake assuming that, owing to the vague regulations, the activities of the sharing economy would have been short-lived. Some success stories have already demonstrated the opposite, and traditional businesses are now struggling to come to terms with that competition. In fact, these two groups operate on the basis of totally different business models, and also have a different business culture. For instance, while the traditional hotel sector is obviously seriously constrained by limited capacity and high fixed costs, the sharing economy approach of firms such as Airbnb seems more flexible. Airbnb does not derive its revenue from the profit margin on overnight stays, but from fees paid by users of the platform. Furthermore, while traditional players have to respect strict standards concerning (fire) safety and hygiene, it is only recently that harmonised conditions were imposed on households offering accommodation via a sharing platform. Thus, since 1 April 2017, anyone in the Flemish Region wishing to offer a house or apartment for rent via an online platform must register the property and provide a fire safety certificate, a plan showing emergency exits, instructions in case of fire (in four languages) and third party liability insurance. The Flanders Tourist Office conducts sample checks. In the Walloon Region, anyone wishing to rent out their property via Airbnb has to submit a statement to the General Commission for Tourism, declaring that they do not let their property for less than one night at a time. They also have to obtain damage liability insurance and a certificate of compliance with the fire safety regulations. People who have been convicted of certain criminal offences are barred. However, the checks on compliance with these rules are not systematic. Customers are expected to report any accommodation shortcomings via the digital platforms to the General Commission for Tourism, which will then conduct an *ex-post* check. Finally, in the Brussels-Capital Region, before any rental takes place, it is necessary to submit a prior declaration to Brussels Economy and Employment, comprising a set of documents such as a certificate of good conduct, a third-party liability insurance contract and a certificate of conformity with urban policy as regards the use of the property to be rented out. Criteria have also been defined concerning the amenities that any property must provide before it can be let out. In that connection, an inspection unit has been set up which conducts checks on site in order to ensure compliance with these rules. In general, it therefore seems that control over the letting of accommodation via sharing platforms depends very much on the obligation to register the accommodation in question. However, there are signs that this obligation is not always respected (De Tijd, 2017).

Another striking point is that many of the best-known names among the sharing platforms make little or no profit, whereas their market valuation is huge (Pakciarz and Dutt, 2015). Airbnb has a stock market value of more than \$ 30 billion, comparable to that of some major hotel chains. The reason could lie in divergent financial prospects, which may be due partly to differences in the regulations that apply to the sharing economy and traditional players.

Where the hotel sector is concerned, the defence of players in the sharing economy is based on the idea of market expansion. According to the CEO of Airbnb, there is no direct competition with the traditional hotel sector, since the two target groups are different, and the advent of Airbnb and other tourism-related platforms is expanding the market by attracting new groups of travellers (Chesky, 2017). The OECD (2016) sees young travellers, for whom the budget and quick access play a major role, as a particular target group for the activities of sharing platforms. Furthermore, the possibility of peer-to-peer interaction that these platforms offer is a unique advantage for those who appreciate contact with local residents during their stay. The greater flexibility that these platforms offer can also permit a speedier response to sudden peaks and troughs in demand, resulting in less volatile prices. Nevertheless, this idea of market expansion does not apply to all branches of activity. In the personal transport sector, the sharing economy is clearly generating direct competition with traditional taxi firms. That may account for that sector’s very strong opposition to firms in the sharing economy.

Empirical studies of the sharing economy, examining whether it represents a substitute or a complement for traditional activities, tend to be very specific and therefore do not permit any general conclusions at this stage. For example, Zervas *et al.* (2016) consider that, in the case of the Texas hotel business, Airbnb can only replace the traditional hotel industry up to a certain point, and that the overall decline in traditional hotel revenues is fairly small, concentrated mainly on budget hotels and those accommodating few business travellers.

Finally, the OECD (2016) states that the threat from the new players could encourage traditional players to invest more in quality or innovation, or even to cooperate with sharing economy initiatives. For instance, the Hilton hotel chain has

established a cooperation agreement with Uber. Similarly, it was recently announced that the Belgian taxi sector (FeBeT) was entering into direct competition with Uber by launching its own app (Victor Cab).

## 5.2 Public opinion

Earlier surveys have shown that the people polled generally see a number of advantages in sharing platforms. Nonetheless, more recent information points to several issues concerning users, workers and outsiders which could erode public support for this form of economy.

### 5.2.1 Consequences for the labour market

The digitisation of the economy naturally implies a change in the traditional employment relationship. As a rule, workers operating in the sharing economy depend on a series of successive jobs (gigs), so that the connection with the sharing economy platform can be called “a continuous working relationship without continuous work” or “work on demand” (National Labour Council, 2017). In theory, this more flexible form of working may benefit groups of people for whom the traditional 38-hour working week is not possible or desirable. According to the report by the High Council for Employment (2016), the digitisation of the economy and the rise of the sharing economy offer career opportunities to “people whose skills were not recognised by the ordinary labour market”.

The flexibility of this type of activity generally also creates some volatility (in job security and income). In that regard, it is not always clear on what basis households offering goods or services are linked to the sharing economy platform. For instance, are they covered by employment law? According to a study by the European Parliament (2017), in most cases, those offering goods or services via platforms are in fact self-employed. They are therefore not covered by the employment law protection measures applicable to employees, e.g. as regards working time, night work, wage protection, etc. However, for most of the 1 200 people polled who actively participate in the sharing economy, the income obtained via the platform is supplementary, although it is the main source of income for about a quarter of them. Policy-makers are therefore generally being called upon to consider whether the difference in status between employees and self-employed persons is appropriate, and in any case to provide a social safety net for those now known as micro-entrepreneurs (Sundararajan, 2016; Harris and Krueger, 2015).

In the absence of detailed data, it is impossible to determine the number of workers using these platforms. Indeed, estimates vary widely: while according to De Groen and Maselli (2016), this new group of workers currently comprises no more than around 100 000 people (or barely 0.05 % of the total number of workers) in the EU, Huws *et al.* (2017) conclude, on the basis of targeted surveys conducted in seven EU countries, that a high percentage of the population (ranging from 9 % in the Netherlands and the UK to 22 % in Italy) has already carried out work via a platform.

### 5.2.2 Nuisance

Activities linked to the sharing economy could lead to nuisance. In that connection, Frenken and Schor (2017) warned against the external effects of the sharing economy on third parties. For instance, in the case of accommodation sharing, this specifically concerns the neighbours, who may suffer nuisance (including noise) and perhaps a greater feeling of insecurity. Some large European cities such as London, Barcelona and Amsterdam have already announced that they want to curb the influx of tourists associated with these activities, and in particular have imposed restrictions on short-term letting.

### 5.2.3 Impact on house prices and rents

The steady rise in Airbnb business is attracting the criticism that use of residential property for short-term letting has an adverse impact on prices and rents in the case of housing intended for permanent occupation. Lee (2016) gives a detailed account of the problem in Los Angeles, where 64 % of accommodation offered through Airbnb consists of houses/apartments which have never been occupied by the owner and are therefore offered solely to tourists. This means that a smaller part of the residential property market is still available for more traditional letting, and that is inevitably driving up the rents. Lee therefore advocates, among other things, setting a limit in certain cities on the number of nights for which any one property can be let out on a short-term basis.



## 5.2.4 Inequality

Another consequence of the sharing economy is that, although cheaper prices are considered beneficial for low-income groups, the sharing economy may actually also lead to greater inequality. In fact, the supplementary income that it generates goes mainly to households with the most valuable assets – not only houses but also cars, boats, etc. – which tend to be concentrated mainly in the higher income groups. In that connection, Frenken and Schor (2017) refer to the “Piketty effect” of the sharing economy.

Moreover, it is highly likely that the benefits of the sharing economy – particularly the lower prices – cannot be enjoyed by everyone owing to unequal access to digital platforms, as it is essential to have an internet connection and, in most cases, a smartphone. In addition, the goods and services on offer are frequently concentrated in cities with a high population density. Consequently, people who live in more isolated areas have less opportunity to make use of them. For instance, in Belgium, Uber is currently only operating within the Brussels Region.

## 5.3 Regulation

The points made above identify a number of specific policy challenges. It is vital to endeavour to protect suppliers/workers in the sharing economy, either by according them special status or by improving the conditions for self-employed workers. There is also a need for a consumer protection system that applies equally to peer-to-peer relationships. The risk of the absence of a specific framework, and the resulting issues, is that *ad-hoc* measures may be taken at various levels of power, leading to a mish-mash of regulations that would be anything but conducive to growth. In any case, the various measures need to be consistent (Federal Council for Sustainable Development, 2017).

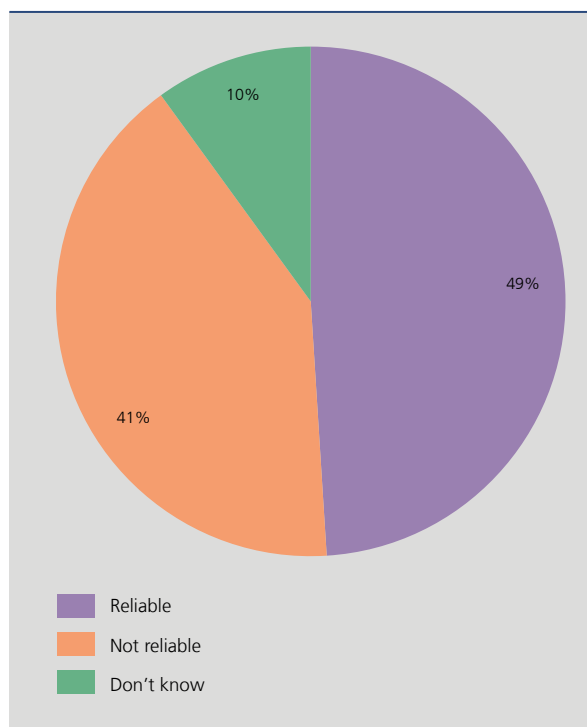
The Federal Council for Sustainable Development likewise points out the importance of creating a “level playing field” in regard to the regulations applicable to the various players (both for traditional businesses and for newcomers in the sharing economy), while taking care not to discourage innovation. A European Parliament Resolution of 15 June 2017 on online platforms and the digital single market stresses that “possible reforms of the existing regulatory framework should concentrate on the harmonisation of rules and reducing regulatory fragmentation”. In that regard, Allendesalazar (2015) states that it is not enough just to extend the old rules to the new forms of market, because “one size does not fit all”. He considers that it would be better to modernise or abolish obsolete rules – applicable to traditional players – rather than impose them on the new players.

Cohen and Sundararajan (2015) also draw attention to the potential benefits of self-regulation for the peer-to-peer economy. Transactions between two individuals are generally accompanied by asymmetric information: as a rule, the owner knows more about all the potential defects in the property than the person who is interested in buying it. Nevertheless, in the case of traditional transactions, it seems best for the government to deal with that asymmetry, e.g. by imposing conditions relating to a quality label or insisting on the provision of information certificates (such as the energy performance certificate in the case of house sales). Conversely, in the case of online platform activities, the internet can be used as a quick and easy way to find numerous reviews on the quality of the property or service being offered. In addition, as the permanence of these platforms depends very much on willingness to share and on trust in strangers, a reliable feedback system is crucial.

Nonetheless, Cohen and Sundararajan (2015) also recognise that a degree of self-regulation need not imply that the government should preferably not intervene at all. For instance, the accuracy of these review systems is questionable. According to the results of the Eurobarometer survey (2016) of online platforms, only half of respondents actually regard such a system as reliable. In the specific case of Airbnb, Fradkin *et al.* (2015) conclude, for example, that the reviews are generally very positive. The reason could be that they are voluntary: people who have a bad experience may simply prefer to leave the platform or stop using it, rather than leave adverse comments. In addition, it is probably a bit trickier to give a negative review after direct personal contact with the third party, or if a mutual feedback system is known to be in place, whereby both the supplier and the user are reviewed. Finally, there are no checks on which reviews are actually posted online by the platforms. Since their income is derived from the number of transactions (on the basis of fees), it is clearly in their interest to attract the maximum number of users, possibly by only publishing the most positive feedback.

Furthermore, the system of rating digital platform users takes no account of the potential negative externalities for third parties caused by (excessive) use of the platform (Cohen and Sundararajan, 2015). We have already drawn attention to the potentially significant nuisance caused to neighbours by the short-term letting of accommodation or the increase in rents and house prices. However, there may equally be positive externalities: for example, if the use of the sharing economy results in more cohesive communities or a reduction in environmental pollution. On the other hand, the government should, in principle, take account of these externalities when drawing up the regulations.

**CHART 9** ASSESSMENT OF THE RELIABILITY OF THE REVIEW AND RANKING SYSTEM BY INTERNET AND PLATFORM USERS IN THE EU



Source: EC Special Eurobarometer 447 (2016) – Online platforms.

## 5.4 Taxation

As regards taxation, the Programme Law of 1 July 2016 aimed to remove the Belgian sharing economy from the grey area where it operated. It allows individuals to engage in an additional activity via an approved platform, so long as they comply with a minimum of formalities and pay a small amount of tax. However, this Law applies only to occasional suppliers of goods and services who are not thereby pursuing their own occupation and who offer their services to other individuals. A new provision effective from 15 July 2018 accords full tax exemption to supplementary income received via approved platforms up to an annual maximum of € 6 000. At the end of the year, the approved sharing economy platforms will have to notify FPS Finance directly of individuals' incomes (and any administrative expenses). Other people engaging in additional activities by providing services direct to other citizens without the intervention of a platform are also eligible for this tax concession, but are then obliged to register electronically (type of activity, period, and amount paid) ([activitescomplementaires.be](http://activitescomplementaires.be)).

In order to be approved, a platform must satisfy a number of conditions. However, those conditions make hardly any distinction between activities and only concern registration, the registered office and the company number. Around thirty platforms have obtained approval since April 2017, but it is not obligatory to apply for such approval, so that some incomes are still liable to end up in the grey area. Nevertheless, as the sharing economy expands and generates more

(undeclared) income, that question will become increasingly crucial for public finances. Yet, since all the transactions effected via a platform are, by definition, electronically recorded and settled, the data that the tax authorities need are actually available, if only an agreement can be concluded for that purpose with the platforms in question. Ultimately, it might even be possible to levy tax more directly, or in real time, via the platform itself (Goudin, 2016). However, Goudin also warns that excessively high or complicated taxes could discourage suppliers from offering their services on these platforms, so that the potential of the sharing economy would not be fully used.

The specific tax treatment of platforms is as yet unclear. In fact, in many cases the registered office is located outside Belgium, leading to a loss of tax revenues on the profits made in Belgium. With the proposal for a common consolidated corporate tax base (CCCTB), the European Commission is taking steps to ensure that the taxes are paid in the country where the value added is created<sup>(1)</sup>.

## Conclusion

The progressive digitisation of everyday life has considerably expanded the opportunities for creating economic value. E-commerce applications are having a real impact on the distribution chain, either because sellers or producers add a digital channel, such as a web shop, to their existing infrastructure, or because new – generally very large – firms have specialised in the large-scale distribution of existing goods or services. Furthermore, as analysed in this article, various new business models have likewise emerged in the sharing economy. Originally, it was mainly a question of sharing or jointly using certain goods or assets which were under-used, and new businesses have created specific digital platforms which are efficient in bringing supply and demand into contact with one another.

A notable feature here is that households themselves are creating ever more value, and therefore becoming producers to some extent. Although part of the turnover that they generate is destined for the firms operating the digital platforms on which the sharing economy operates, they thus also secure an (additional) income. Moreover, the prices charged are often lower than for comparable products in the “traditional” economy, and that also enhances consumer welfare.

Sharing economy initiatives are evident in a wide range of sectors, although they are currently most significant in personal transport and tourist accommodation. Consequently, the success achieved in these particular niches is blurring the boundaries with the traditional economy, and with e-commerce, because traditional firms are now developing efficient IT applications, comparable to those of the sharing economy, in order to make their goods and services available to the general public and thus to protect themselves against this new competition. For that purpose, they sometimes also use sharing platforms, and that further blurs the original peer-to-peer relationship that was a feature of the sharing economy.

However, it is currently difficult to offer a complete picture of this “new” economy owing to the lack of exhaustive and comparable data. Nonetheless, for the moment, the sharing economy clearly does not represent more than a tiny fraction of total value added at macroeconomic level. That is certainly true for Belgium, where – according to the survey data – the sharing economy is taking longer to get established than on average in neighbouring EU countries. Nevertheless, this new form of economy has generally recorded dramatic growth in recent years – driven not only by technological developments but also by the changing value models in society – and most forecasts predict that it will continue to gain importance in the coming years. The economic influence of the sharing economy and, more generally, the activities concerning digital platforms, also extends beyond just its share of value added: the resulting increase in transparency and competition in the various branches of activity is curbing price rises and also boosting efficiency in traditional firms.

It is a serious challenge for statistical institutes to incorporate this new activity properly in the national accounts. The value added created and the incomes received via sharing economy activities must be reflected accurately in the statistics. But at present, that is often not the case, particularly owing to the lack of available statistical sources. Traditional data collection methods need to be refined, and the use of new techniques such as web scraping could be considered. In addition, the obligation to report statistical data should take account of the fact that, in the sharing economy, private

(1) Companies that engage in cross-border activities and are subject to the CCCTB system would be able to complete a single, consolidated tax return for all their activities within the EU. The group's consolidated taxable results would then be apportioned among the group companies via a simple formula. That would enable each Member State to apply its own tax rates to the profits of companies resident in its territory.

households also produce value added, and the relevant data are often stored centrally by the foreign firms operating the IT platforms. Statistical reforms of this type could also form part of a wider debate on the impact of digitisation and this new form of economy on the relevance of GDP as a measure of wealth.

Moreover, the rapid rise of the sharing economy raises the question of the extent to which the regulatory framework needs to be adjusted or tightened up. That applies, of course, to the tax rules, for which a special framework was recently established in Belgium, but also, for example, to the social protection of workers and consumers. In general, the competent public authorities need to achieve the right balance between two objectives here. On the one hand, it is necessary to prevent unfair competition: ideally, traditional firms and sharing economy initiatives active in the same sector should be subject to the same rules. On the other hand, the dynamism of this economy must not be constrained by excessive regulation: in some branches of activity, the rapid entry of new players in the sharing economy may also be a sign that “traditional” businesses operating in those branches are struggling to achieve efficiency gains owing to excessive regulation that may lead to restrictions on supply. In that regard, the economic literature points out the potential advantage of (partial) self-regulation. For instance, in order to ensure confidence in the quality of what they offer, sharing economy platforms give their users the opportunity to share their experiences online with other users.

## Bibliography

- Allendesalazar R. (2015), *The impact of competition laws on e-commerce and sharing economy. A Spanish perspective*, European Seminar on Competition Law, 20 November ([http://www.aedc.es/wp-content/uploads/2016/01/Panel-6-Presentaci%C3%93n-2015-11-20\\_4ESPACEFINE%20ESPACEFINE%AA-sesi%C3%93n-R-Allendesalazar\\_FINAL1.pdf](http://www.aedc.es/wp-content/uploads/2016/01/Panel-6-Presentaci%C3%93n-2015-11-20_4ESPACEFINE%20ESPACEFINE%AA-sesi%C3%93n-R-Allendesalazar_FINAL1.pdf)).
- Bardhi F. and G. M. Eckhardt (2015), *The Sharing Economy Isn't About Sharing at All*, Harvard Business Review, 28 January (<https://hbr.org/2015/01/the-sharing-economy-isnt-about-sharing-at-all>).
- Bardhi F. and G. M. Eckhardt (2017), "Liquid consumption", *Journal of Consumer Research*, 44 (3), 582-597.
- Bean C. (2016), *Independent Review of UK Economic Statistics* (<https://www.gov.uk/government/publications/independent-review-of-uk-economic-statistics-final-report>).
- Beck P., M. Hardie, N. Jones and A. Loakes (2017), *The feasibility of measuring the sharing economy: November 2017 progress update*, UK Office for National Statistics (<https://www.ons.gov.uk/economy/economicoutputandproductivity/output/articles/thefeasibilityofmeasuringthesharingeconomy/november2017progressupdate>).
- Bergh A. and A. Funcke (2016), *Does country level social trust predict the size of the sharing economy?*, IFN Working Paper 1130.
- Botsman R. (2013), *The Sharing Economy Lacks A Shared Definition* (<https://www.fastcompany.com/3022028/the-sharing-economy-lacks-a-shared-definition>).
- Chesky B. (2017), "Q&A With Brian Chesky: Disruption, Leadership, and Airbnb's Future", *Fortune*, interview par Leigh Gallagher, 27 March.
- Cohen M. and A. Sundararajan (2015), "Self-Regulation and Innovation in the Peer-to-Peer Sharing Economy", *University of Chicago Law Review Online*, 82 (1), 116-133.
- Coyle D. (2016), *The Sharing Economy in the UK* (<http://www.sharingeconomyuk.com/perch/resources/210116thesharingeconomyintheuktpdc.docx1111.docx-2.pdf>).
- Davidson N. M. and J. J. Infranca (2016), "The Sharing Economy as an Urban Phenomenon", *Yale Law & Policy Review*, 34 (2), 215-279.
- De Coen A. and V. Vanoeteren (2017), "Vanuit de kinderschoenen naar de puberteit: de Vlaamse deeleconomie in kaart gebracht", *Over.Werk. Tijdschrift van het Steunpunt Werk*, 27 (2), 33-40.
- De Groen W. P. and I. Maselli (2016), *The impact of the Collaborative Economy on the Labour Market*, CEPS Special Report, June.
- De Tijd (2017), *Vlaamse Airbnb-verhuurders lappen regels aan hun laars*, 4 August (<https://www.tijd.be/ondernemen/horeca/vlaamse-airbnb-verhuurders-lappen-regels-aan-hun-laars/9920001.html>).
- EC (2016), *Online platforms*, Special Eurobarometer 447.
- EC (2016), *The use of collaborative platforms*, Flash Eurobarometer 438.
- EC (2017), *Exploratory Study of consumer issues in peer-to-peer platform markets* ([https://ec.europa.eu/newsroom/document.cfm?doc\\_id=45245](https://ec.europa.eu/newsroom/document.cfm?doc_id=45245)).

Enders A., A. König and C. Grobe (2015), *The Sharing Economy: Upending Business as Usual*, Insights@IMD No. 53 (<https://www.imd.org/research/publications/upload/53-The-Sharing-Economy-final-03-12-15.pdf>).

European Parliament (2017), *The Social Protection of Workers in the Platform Economy*.

European Parliament (2017), *Resolution of 15 June 2017 on online platforms and the digital single market*.

Evans P. C. and A. Gawer (2016), *The Rise of the Platform Enterprise: A Global Survey*, The Emerging Platform Economy Series No. 1, The Center for Global Enterprise ([https://www.thecge.net/app/uploads/2016/01/PDF-WEB-Platform-Survey\\_01\\_12.pdf](https://www.thecge.net/app/uploads/2016/01/PDF-WEB-Platform-Survey_01_12.pdf)).

Federal Council for Sustainable Development (2017), *Opinion proposing guidelines on the collaborative economy* ([https://www.frdo-cfdd.be/sites/default/files/content/download/files/2017a02f\\_0.pdf](https://www.frdo-cfdd.be/sites/default/files/content/download/files/2017a02f_0.pdf)).

Fradkin A., E. Grewall, D. Holtz and M. Pearson (2015), *Bias and Reciprocity in Online Reviews: Evidence From Field Experiments on Airbnb*, Proceedings of the Sixteenth ACM Conference on Economics and Computation.

Frenken K. and J. Schor (2017), "Putting the sharing economy into perspective", *Environmental Innovation and Societal Transitions*, 23, 3-10.

Goudin P. (2016), *The Cost of Non-Europe in the Sharing Economy: Economic, Social and Legal Challenges and Opportunities*, European Parliamentary Research Service.

Harris S. D. and A. B. Krueger (2015), *A Proposal for Modernizing Labor Laws for Twenty-First-Century Work: The Independent Worker*, The Hamilton Project Discussion Paper, 10.

High Council for Employment (2016), *Rapport 2016: Économie numérique et marché du travail*.

Huws U., N. Spencer, D. Syrdal and K. Holts (2017), *Work in the European Gig Economy*, FEPS, Uni Europa and Hertfordshire Business School.

ING (2015), *ING International Survey: What's mine is yours – for a price. Rapid growth tipped for the sharing economy*.

ING (2016), "The sharing economy: time for a clear definition", *ING Belgium Economic Newsletter*, 19 April.

Itkonen J. (2017), "How can we measure the economy in the digital era?", *Bank of Finland Bulletin*, 3.

Lee D. (2016), "How Airbnb Short-Term Rentals Exacerbate Los Angeles's Affordable Housing Crisis: Analysis and Policy Recommendations", *Harvard Law and Policy Review*, 10, 229-253.

Lobel O. (2016), "The Law of the Platform", *Minnesota Law Review 2016, San Diego Legal Studies Paper No. 16-212* ([https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2742380##](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2742380##)).

National Labour Council (2017), *Diagnostic des partenaires sociaux concernant la digitalisation et l'économie collaborative – Exécution de l'accord interprofessionnel 2017-2018*, Report n° 107.

Nielsen (2014), *Is sharing the new buying? Reputation and trust are emerging as new currencies*.

Nielsen (2015), *Global trust in advertising – Winning strategies for an evolving media landscape*.

OECD (2016), *Tourism trends and policies* ([https://www.oecd-ilibrary.org/fr/industry-and-services/tendances-et-politiques-du-tourisme-de-l-ocde-2016\\_tour-2016-fr](https://www.oecd-ilibrary.org/fr/industry-and-services/tendances-et-politiques-du-tourisme-de-l-ocde-2016_tour-2016-fr)).

Pakciarz I. and I. Dutt (2015), *The "Sharing Economy": Good for Consumers, Bad for Investors*, Thinking Man's Approach No. 32.

PwC (2014), *The sharing economy: how will it disrupt your business?* ([http://pwc.blogs.com/files/sharing-economy-final\\_0814.pdf](http://pwc.blogs.com/files/sharing-economy-final_0814.pdf)).

PwC (2016), *Assessing the size and presence of the collaborative economy in Europe* (<https://publications.europa.eu/en/publication-detail/-/publication/2acb7619-b544-11e7-837e-01aa75ed71a1/language-en>).

PwC (2018), *Share Economy 2017 – The New Business Model* (<https://www.pwc.de/de/digitale-transformation/share-economy-report-2017.pdf>).

Rifkin J. (2000), *The Age of Access: The New Culture of Hypercapitalism Where All of Life Is a Paid-For Experience*, New York, J.P. Tarcher/Putnam.

Schor J. B. and W. Attwood-Charles (2017), "The 'sharing' economy: labor, inequality, and social connection on for-profit platforms", *Sociology Compass*, 11(8).

Sundararajan A. (2016), *The Sharing Economy, The End of Employment and the Rise of Crowd-Based Capitalism*, Cambridge, Massachusetts and London, England, The MIT Press.

Zervas, G., D. Proserpio and J. W. Byers (2017), "The Rise of the Sharing Economy: Estimating the Impact of Airbnb on the Hotel Industry", *Journal of Marketing Research*, 54(5), 687-705.

# Does job polarisation imply wage polarisation ?

F. De Sloover  
Y. Saks

## Introduction

The labour market is changing, partly as a result of the globalisation of economies and technological progress. Economic crises are accelerating the consequences of these changes. Industry, which traditionally provided a large number of medium-skilled jobs, has been particularly affected and in the advanced economies, which are increasingly becoming service-based, its workforce has shrunk.

If jobs are ranked by occupation, it is evident that the proportions of highly-skilled and low-skilled occupations (the best paid and the lowest paid respectively) have increased over the years, while the share of medium-skilled jobs has declined. The labour market is thus becoming polarised between low-skilled (“lousy jobs”) and highly-skilled (“lovely jobs”), at the expense of medium-skilled jobs. “Middle-class” jobs are tending to disappear.

Are wages becoming polarised too? In other words, is there a widening pay gap in favour of the most highly skilled, and wage decline or stagnation in the case of intermediate jobs? Has the pay gap between low-skilled and medium-skilled employees narrowed over the past decade? The article describes the situation in Belgium in the European context.

The article is in three sections. Section 1 explains the concept of job polarisation and the possible causes of this empirical finding. Section 2 describes wage dispersion in the various countries over the past ten years. Section 3 analyses the Belgian data from the Structure of Earnings Survey from 2004 to 2014. We start by presenting the data before examining the wage determinants, first for the averages and then for the various deciles within the distribution. Finally, we decompose the variation of the aggregate wage over the observation period into a factor due to changes in the characteristics of the employee population during that period and other factors. The article ends with our conclusions.

## 1. Job polarisation

In the United States, wage inequality has increased sharply since the late 1970s. The explanation most frequently put forward is that technological progress is biased in favour of the best-educated and/or most highly-trained workers (skill-biased technological change – SBTC), a theory based on the assumption that technological progress in recent decades has primarily raised the productivity of the most highly-educated people, rather than that of the low or medium skilled. The capabilities of highly-educated workers are a better complement for innovations in production processes (primarily progress in information and communication technology – ICT), thus causing a shift in demand for labour to the more highly-skilled.



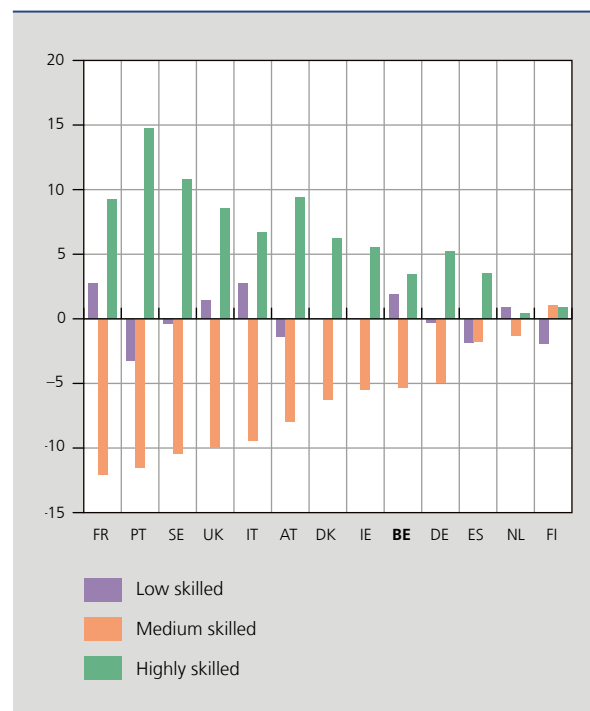
Autor *et al.* (2003) modified that approach. It is not so much the workers' educational qualifications as their skills, broken down into tasks, that permit to assess the complementarity between work and technological progress. They "translated" the content of jobs into tasks which they classified in two sub-sets: routine tasks and non-routine tasks. Routine tasks are easy to formalise and can therefore be programmed and automated. Conversely, non-routine tasks cannot (yet) be carried out by machines. That distinction is constantly changing as a result of technological progress.

The "task" content was analysed for each occupation. Broadly speaking, highly-skilled occupations – which have become more prevalent – consist mainly of abstract, non-routine tasks requiring in-depth knowledge, creativity and people skills. Low-skilled occupations, which (in some countries) have gained importance on the labour market, are usually service jobs linked to particular people and/or places. They also include non-routine tasks (interaction with people/the context). In contrast, medium-skilled occupations mainly comprise routine tasks. These are the occupations most under threat in the advanced economies.

With this approach, we obtain predictions for the United States compatible with what we find in the data on the skill-based employment structure: routine work is substituted by computers and robots, whereas they complement abstract work. As in the SBTC theory, exposure to technology is not neutral but its effects are different for the medium-skilled and the low-skilled segments.

Apart from the factors relating to technological progress, there are plenty of additional or competing theories on job polarisation. The expansion of trade (industrial relocation, etc.) has also played a part. While workers/consumers in the advanced countries undeniably benefit from globalisation, in contrast low-skilled or medium-skilled jobs – if they can be

**CHART 1**      **JOB POLARISATION IS ALSO EVIDENT IN EUROPE**  
 (change in employment structure between 1999 and 2016 by skill level<sup>(1)</sup>, in percentage points)



Source: Eurostat.

(1) Highly-skilled jobs correspond to occupations such as directors, managers, intellectual and scientific occupations, technical occupations and the like (categories 1, 2 and 3 in the ISCO-88 classification). Medium-skilled jobs correspond to occupations which include office clerks, service personnel, craft and related trades workers, plant and machine operators and assemblers (categories 4, 5, 7 and 8 in the ISCO-88 classification). Low-skilled jobs correspond to labourers and unskilled cleaners, caretakers and maintenance workers (category 9 in the ISCO-88 classification).

relocated – suffer the adverse consequences (Feenstra and Hanson, 1996; Goos *et al.*, 2014). Other theories suggest that labour market institutions (such as the existence of a minimum wage, job protection, etc.) vary in their effects according to the skill group, and could therefore likewise contribute to polarisation.

In this section, we use the data from the labour force surveys. In line with most empirical studies on this subject, we examine a job's skills by considering occupations rather than educational levels. Occupations are generally classified according to wages. Here, we simply divide occupations into three skill groups. Jobs in agriculture and the armed forces are excluded.

Highly-skilled jobs correspond to occupations such as directors, managers, intellectual and scientific occupations, technical occupations and the like (categories 1, 2 and 3 in the ISCO-88 classification). Low-skilled jobs correspond to elementary occupations (category 9 in the ISCO-88 classification, which includes labourers and unskilled cleaners, caretakers and maintenance workers). Medium-skilled jobs cover the other occupations (categories 4, 5, 7 and 8 in the ISCO-88 classification, which includes office clerks, craft and related trades workers, plant and machine operators and assemblers). The data here concern all workers.

The results obtained are compatible with the hypothesis of job polarisation in all EU15 countries. Between 1999 and 2016, the prevalence of medium-skilled jobs declined (down by an average of 6.6 percentage points) in favour of an increase in the share of highly-skilled jobs (+6.5 points) and, to a lesser degree, low-skilled jobs (+0.1 point). The scale of the phenomenon varies from one country to another. In some countries, low-skilled jobs are also declining, as in Portugal, Austria and Spain. In others, such as Finland and the Netherlands, the expansion of highly-skilled jobs is less pronounced.

According to this definition of jobs and occupational categories, Belgium recorded a 5.4 percentage point decline in medium-skilled jobs over this period, while highly-skilled jobs increased by 3.4 points and low-skilled jobs by 1.9 points.

These findings on job polarisation are robust in that they are borne out by other data banks (the Structure of Earnings Survey (SES) in Europe, the Current Population Survey (CPS) and the administrative social security data in the United States, etc.), but are also confirmed by more detailed occupational categories.

### *Polarisation reflects higher demand for skilled labour*

Polarisation is the outcome of the changes in demand for labour. During the period considered, the supply of skilled labour has also increased enormously, but the relative earnings of the most highly-skilled have not fallen, showing that the shift in demand for skilled labour has more than offset this expansion of supply.

While analysis of occupations according to the task content implies that technological progress varies in its impact on the three skill groups (favourable for the highest-skilled, adverse for the medium-skilled and neutral for services activities concentrated mainly in the least-skilled segment), in their model, Cozzi and Impullitti (2016) conclude that a general equilibrium mechanism explains an increase in demand (and wages) for service workers compared to other low-skilled activities. The technological catching-up process between advanced economies is said to imply stronger competition for attracting the most highly-skilled workers. The rise in relative pay for highly-skilled work and the increased dispersion in the upper part of the wage distribution lead these workers to make more use of services activities so that they can devote more time to their own occupation.

In Belgium, this was one of the arguments for creating the service voucher system. The growth of low-skilled employment is evident mainly in the expansion of personal services in the broad sense (domestic help, care assistants, etc.). Since the system was set up in 2004, it has created no fewer than 130 000 jobs, most of which are filled by women.

## 2. Limited wage dispersion in Belgium

In order to calculate the distribution deciles, all employees are ranked according to their wage level. The first decile (D1) separates the 10 % of employees on the lowest wages from the other 90 % of employees. This is a measure of low wages. The ninth decile (D9) separates the 90 % of employees paid lower wages from the 10 % of the population with

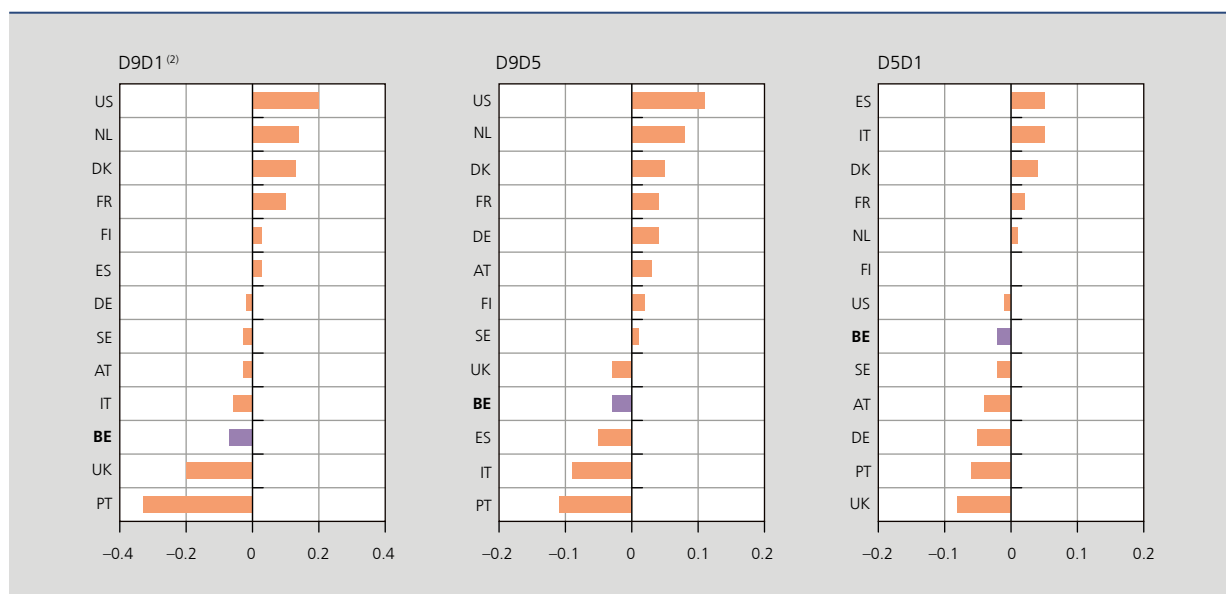
the highest earnings. That is therefore a measure of high wages. Consequently, the ratio between D9 and D1 (called D9D1) measures the dispersion across the whole distribution. In general, dispersion is also apparent within each decile, and that dispersion increases at higher levels in the distribution. The first deciles are more uniform, as they comprise more generic jobs, particularly as regards pay. Conversely, the last deciles encompass employees in jobs where both the content and the responsibilities are diverse, and that is reflected in a wide range of pay.

Chart 2 shows the variation in dispersion in various countries between 2006 and 2016. In one group of countries, particularly the United States but also the Netherlands, Denmark and France, the D9D1 ratio has gone up. That is not the case in Belgium, which belongs to the group of countries where wage differentiation has tended to decline over the recent period. That is all the more remarkable as the level of wage differentiation is already low in Belgium, with a D9D1 ratio of 2.36 in 2015. Among the EU15 countries, only Italy had a lower dispersion, namely 2.25. For comparison, in the United States these deciles have a ratio of 5.05, which is equivalent to a dispersion almost twice as great as in Belgium.

To ascertain whether inequality has worsened uniformly or whether it tends to be concentrated in the upper or lower part of the distribution, the ratio of high wages to median wages (D9D5) and the ratio of median to low wages (D5D1) are considered separately. Comparison between countries reveals that the widening wage inequality in the United States and the Netherlands over the past decade is due to greater differentiation in the upper part of the distribution: it is mainly high incomes that have risen, compared to medium and low incomes. There is also increasing dispersion in the upper part of the distribution in Germany, Austria and Finland, whereas wage inequality in general has diminished in those three countries. The increase in dispersion in France and Denmark seems to be more evenly distributed.

In Belgium, the decline in dispersion is due to reduction in both the upper and lower parts of the distribution. That is also the case in Portugal and the United Kingdom, but in absolute terms, those two countries have much greater wage inequality than Belgium.

**CHART 2** WAGE DISPERSION IS DECLINING IN BOTH THE UPPER AND LOWER PARTS OF THE DISTRIBUTION IN BELGIUM  
(in percentage points, difference in dispersion indicators between 2006 and 2016<sup>(1)</sup>)



Source : OECD.

(1) 2016 or the latest available year (2015 for Belgium).

(2) D9D1 : ratio between the 9<sup>th</sup> and 1<sup>st</sup> deciles of the wage distribution. The ratios D9D5 and D5D1 are defined in the same way.

## 3. Trend in wages in Belgium: use of the SES

### 3.1 Data

We use data from the annual Structure of Earnings Survey (SES) in Belgium for the years 2004 to 2014<sup>(1)</sup>. That survey provides detailed information on the level of hourly, monthly and annual pay in relation to employees' individual characteristics (sex, age, occupation, tenure, highest educational level attained, etc.) and their employer (industry, region, size and economic control of the undertaking). In order to control for the effect of working time, we focus on hourly pay. Mean gross hourly wages are defined as gross pay in the reference month (namely October) divided by the number of hours paid during that period. We deflated the gross hourly pay by the harmonised index of consumer prices (HICP)<sup>(2)</sup> in order to control for price effects. We only study wages from the point of view of paid employees, and take no account of an individual's decision on whether or not to participate in the labour market.

As in the other parts of this article, we define skill levels on the basis of the types of occupation<sup>(3)</sup>. Managers, members of the intellectual and scientific occupations and those in intermediate occupations belong to the highly-skilled jobs category, while people in elementary occupations are classed as low-skilled. Other types of occupation are considered to be medium-skilled.

The proportion of highly-skilled and low-skilled jobs has grown in relation to medium-skilled occupations over the relatively short period of ten years. The rise is most marked in the case of highly-skilled jobs. It is important to study the distribution of jobs according to skills, rather than the distribution of workers according to level of education, although the two may influence one another. Nonetheless, the distribution according to skills gives a clearer picture of demand for labour, while the distribution according to level of education tells us more about the supply of labour. A comparison shows that the proportion of highly educated workers continued to rise between 2004 and 2014, while that of workers with a medium or low level of education declined. The biggest fall occurred in the percentage of workers with a low level of education. The level of education of consecutive cohorts went up sharply over the decades in the 20<sup>th</sup> century. The oldest cohorts entering retirement in the initial decades of the 21<sup>st</sup> century will therefore automatically boost the proportions of workers in the labour force with a medium or high level of education, but that tells us little about the skills required to perform the jobs available on the labour market. In the rest of this section, we shall therefore focus on skill levels.

#### *No rise in gross wages in real terms in Belgium between 2004 and 2014*

According to the SES data, aggregate real wages have fallen, regardless of the level of skills. The low-skilled recorded the biggest decline (–2.2 % per annum, compared to –0.3 % for the medium-skilled and –0.8 % for the highly-skilled). This suggests that low-skilled workers have suffered more, on average, from the changes in the economy during the period under review. Wages in highly-skilled jobs have also fallen more than those in medium-skilled jobs. However, the economic and financial crisis and wage moderation measures were naturally significant factors here.

### 3.2 Wage determinants

#### 3.2.1 Determinants of average wages

To gain a better understanding of the factors that play a major role in determining mean wage growth, we carry out a regression of the explanatory variables available to us on the logarithm of real hourly wages using the ordinary least squares method. In particular, we examine the effect of the following factors: sex, educational level, type of employment contract, blue-collar or white-collar status, tenure, experience, level of skills, number of employees in the firm, the region where it is based, and whether it has one or more establishments, whether it is under private or public control, and the branch of activity in which it operates. Since some of these variables are coded as dummy variables, it is important to define the chosen reference individual: it is a moderately educated man working full-time under a permanent contract

(1) Data from the 2015 survey are also available but the collection method has changed: questions are now put to firms via the internet instead of by interviewers, and that may affect the comparability of the results with those of previous surveys.

(2) For the sake of international comparability, we used the HICP rather than the health index.

(3) The definition of skill levels is based on the International Standard Classification of Occupations (ISCO).

**TABLE 1** ESTIMATION OF WAGE EQUATIONS BASED ON SES DATA FOR BELGIUM

	2004 log (hourly wage in constant euros)	2014 log (hourly wage in constant euros)
Female .....	-0.1417*** (0.0024)	-0.0579*** (0.0021)
Low educational level .....	-0.0751*** (0.0025)	-0.1094*** (0.0022)
High educational level .....	0.1774*** (0.0030)	0.1814*** (0.0033)
Age .....	0.0241*** (0.0009)	0.0356*** (0.0008)
Age squared .....	-0.0002*** (0.0000)	-0.0003*** (0.0000)
Blue-collar worker .....	-0.0846*** (0.0031)	-0.0100*** (0.0025)
Tenure .....	0.0094*** (0.0004)	0.0078*** (0.0003)
Tenure squared .....	-0.0002*** (0.0000)	-0.0002*** (0.0000)
Part-time <sup>(1)</sup> .....	0.0040 (0.0025)	-0.0452*** (0.0029)
Low-skilled job .....	-0.0156*** (0.0041)	-0.0401*** (0.0039)
Highly-skilled job .....	0.2182*** (0.0032)	0.2198*** (0.0033)
Temporary contract .....	-0.0367*** (0.0066)	0.2496*** (0.0071)
Number of employees in the establishment .....	0.0001*** (0.0000)	0.0000*** (0.0000)
Undertaking with multiple establishments .....	0.0230*** (0.0026)	0.0460*** (0.0019)
Brussels .....	-0.0044 (0.0030)	-0.0065** (0.0026)
Wallonia .....	-0.0466*** (0.0023)	-0.0536*** (0.0020)
Mixed or public enterprise .....	-0.1368*** (0.0052)	-0.0673*** (0.0036)
Constant <sup>(2)</sup> .....	2.0098*** (0.0159)	1.5753*** (0.0165)
Number of observations .....	83802	81923
Adjusted R <sup>2</sup> .....	46.3%	57.3%

Source: Statbel.

Standard deviations in brackets.

\* p-value < 10 % \*\* p-value < 5 % \*\*\* p-value < 1 %.

The dummy variables for the branches of activity are not included in the table.

(1) The sample only includes full-time workers. This variable indicates that the person worked fewer hours than specified in the employment contract.

(2) Reference: man, medium educational level, white-collar status, full-time, medium-skilled job, permanent contract, firm in manufacturing industry with only one establishment located in Flanders and controlled by private shareholders.

in a private company in the manufacturing sector with a single establishment in Flanders, performing a medium-skilled white-collar job. The estimates were produced separately for each year from 2004 to 2014.

If we control for all the explanatory variables included in the model, the degree to which female workers are disadvantaged declines during the years considered. In 2004, women earned about 14 % less than men, but that gap had fallen to 6 % by 2014. Although we excluded part-time workers, some people worked less than 35 hours a week in practice during the reference period. In general, after adjustment for their other characteristics, they have earned around 5 % less than full-time workers since the crisis.

On average, highly-educated individuals earned about 20 % more than the moderately-educated, while those with a low level of education earned about 8-11 % less. Under Belgian employment law, the hourly wages of workers employed under temporary contracts must be the same as those of permanent employees. According to our database, however, their wages appear to be different. That may also be due to divergences in unobserved characteristics between the two groups of workers not included in the regression. While workers on temporary contracts earned less, on average, at the start of the period considered, they were paid more than permanent workers from 2006 onwards.

In Belgium, wages increase with length of service for the same employer. Every additional year of service pushes up real hourly wages by an average of 0.7 % to 0.9 %. Nonetheless, the quadratic term reveals a concave relationship, with pay rises levelling out at the highest seniority levels. Apart from tenure, potential experience is also rewarded by the market. The marginal effect of an additional year's work (measured here simply according to the employee's age) is estimated at between 2 % and 3.5 %.

Workers in highly-skilled jobs earned 22 % more, on average, than those in medium-skilled jobs. In low-skilled occupations, the estimates are less consistent; on average, low-skilled workers earned between 2 % and 4 % less than the medium-skilled. Wages in Brussels, which did not differ significantly from those in Flanders at the start of the period, were 0.5 % lower at the end of the period. In Wallonia, wages were persistently lower on average than in Flanders. As regards differences between branches of activity, in the hotel and restaurant sector and, to a lesser extent, the trade branch, wages were consistently lower than in manufacturing industry. Conversely, average pay was higher in the "utilities sector" and in the financial sector. In industry, pay differentials seem to have been influenced considerably by the effects of the business cycle, especially in 2008 and 2012. We therefore focus solely on 2004 and 2014, when there were no major crises so that cyclical movements caused less distortion. Table 1 presents the estimates for those two years.

### 3.2.2 Different effects depending on the position in the wage distribution

The effect of a variable is not necessarily constant regardless of the employee's position in the wage distribution. For example, possession of a driving licence is certainly a positive pay factor, on average, but the effect is greater in the lower part of the distribution than in the higher deciles.

To conduct this type of analysis, we perform a quantile regression which is very similar to the classic regression, except that here we examine the situation within each quantile.

Thus, with our wage equation, we have estimated the following model for each decile in the distribution :

$$\text{decile}_j(\log(\text{wage}|X)) = X'\beta_j$$

where  $j$  varies from 0.1 to 0.9. These regressions can be used to determine how each decile changes according to the available explanatory variables. These estimates were produced for 2004 and 2014. The main results are presented in chart 3.

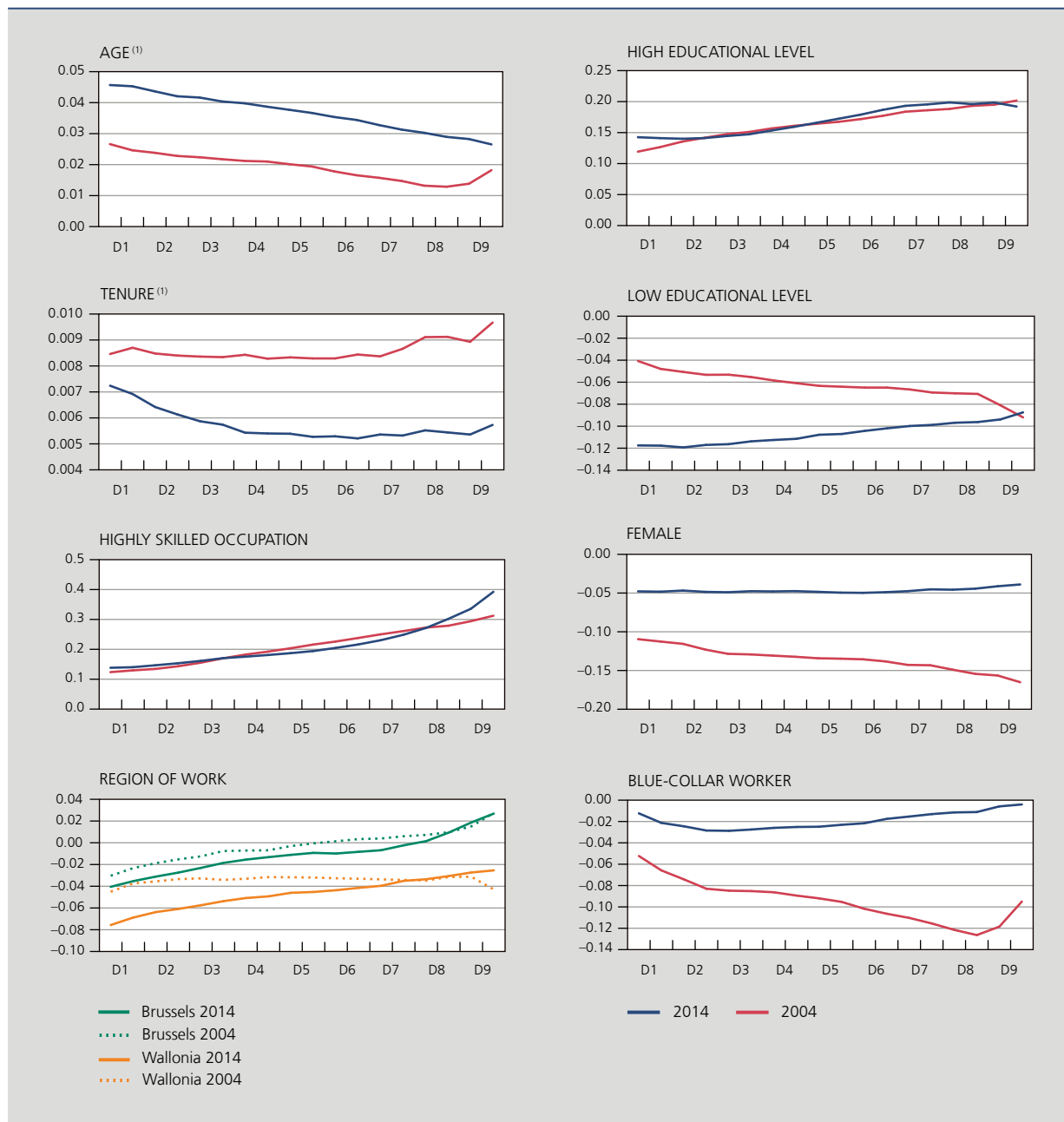
The main wage determinants are the level of skills, educational level and experience. The SES distinguishes between potential experience (measured by age) and tenure i.e. the number of years that the employee has spent working for the same employer.

Employees with a higher education diploma earn about 17 % more than those with a medium educational level (i.e. those completing secondary education). Possession of a higher education diploma has a positive effect regardless of the decile, but the effect increases the higher the position in the wage distribution. For the low-wage workers group (whose pay is lower than the first decile), the advantage associated with a higher education diploma was 12 % (14 % in 2014).

In contrast, in the best paid group, that advantage was almost twice as high in 2004, at 20 % from the 8<sup>th</sup> decile onwards (and likewise 20 % in 2014).

The disadvantage for employees with the lowest qualifications (no more than a lower secondary education diploma) compared to people successfully completing secondary education ranged between 4 % in the lowest decile and 9 % in the highest deciles. In 2014, that figure ranged from 9 % for low wage-earners to 12 % in the upper part of the distribution.

**CHART 3 THE EFFECTS SOMETIMES DIFFER WIDELY DEPENDING ON THE POSITION IN THE WAGE DISTRIBUTION, IN 2004 AND IN 2014**  
(in percentage points, by deciles)



Source: Statbel.

(1) Both age and tenure are continuous variables in the data bank. The chart shows the marginal effect per additional year. That effect takes account of the quadratic term.

Whatever the position in the wage distribution, experience (measured here by age) and tenure are always rewarded in Belgium. In 2004, according to the SES data, that reward ranged between 1 % and 3 % for each additional year's experience, depending on whether the upper or lower part of the distribution was considered. For the 2014 figures, that range widened to between 3 % and 5 % depending on the decile. The return on experience diminishes (the quadratic term has a negative sign), with the maximum pay achieved on average at the age of 61 years in 2004, compared to 64 years in 2014. The reward for tenure, which partly measures the human capital specific to the employer, was 0.9 % for each additional year in 2004. That gain was fairly uniform across the distribution. In 2014, the figure ranged between 0.5 % and 0.7 % per additional year, with a greater advantage for the lower deciles, although it was still significant for all employees. The amount paid for tenure was greatest, *ceteris paribus*, at about 30 years in 2004 and 24 years in 2014.

A highly-skilled occupation has a positive effect regardless of the worker's position in the wage distribution, but that advantage is greater the higher the pay. That finding is fairly consistent over the observation period.

On the basis of the SES data for Belgium, it is possible to determine whether workers have blue-collar or white-collar status. That distinction is not based on the job performed in the firm or branch of activity, but on the type of employment contract. Under Belgian employment law, that distinction was particularly important in regard to pay scale rises, redundancy payments and the rules on absenteeism. Since 1 January 2014, the two types of status have been harmonised. The data on wages reflect that change. Depending on the decile, the disadvantage in terms of pay ranged between 5 % and 13 % in 2004. In 2014, the disadvantage for blue-collar workers declined substantially, remaining slightly negative and ranging between -3 % for the upper deciles and virtually 0 % in the lower part of the distribution. It would be worth conducting a more detailed study of the link between the changing return on tenure and the status harmonisation.

In 2004, even controlling for the branch of activity, occupation, tenure and educational level, women were still at a considerable disadvantage in terms of wages. Moreover, these differences between men and women were even greater at higher levels in the distribution. Depending on the other observable characteristics, the 9<sup>th</sup> decile of the female wage distribution was 17 % lower than the 9<sup>th</sup> decile of the wage distribution of their male counterparts, whereas that gap was only 11 % for the 1<sup>st</sup> decile. These divergences could be due, for example, to a "glass ceiling" blocking the promotion path at higher levels in the wage hierarchy. That situation has changed considerably. According to the 2014 data, the average disadvantage has declined to around 5 %. Furthermore, that effect is much more uniform across the deciles than in 2004.

The regional location of the establishment where the employee works is another significant variable according to the Belgian data. Regardless of the decile, pay is lower in Wallonia than in Flanders. For Brussels, the sign changes across the distribution. The lower deciles are better paid in Flanders, whereas that is no longer the case for the upper deciles. It is the quantile regression that reveals these variations, since wages in Brussels did not differ significantly from those in Flanders in 2004, and were slightly lower in 2014.

The findings presented here do not make it possible to distinguish the effect of a significant factor: the composition of paid employment has also changed greatly over time, even though the period of our study is limited to ten years. For instance, in 2014, the proportion of employees with a higher education diploma had risen by 7 percentage points, and the proportion of highly-skilled jobs was up by 8 percentage points, employees were two years older, on average, than in 2004, the proportion of women in work had continued to rise slowly, and the proportion of blue-collar status had diminished. In the next section, we examine the effect of these changes.

### 3.3 Composition effects and change in aggregate wages

Having examined the results of the Mincer equations<sup>(1)</sup>, we shall break down the variation in wages between 2004 and 2014 into a part attributable to changes in the composition of employment and a part due to changes in the returns on the characteristics or to unobserved factors. For that purpose, we use the Blinder-Oaxaca decomposition.

The Blinder-Oaxaca technique explains the gap in the means of an outcome variable between two groups; in our case, we examine the difference in the level of average wages between 2004 and 2014. We begin by checking whether

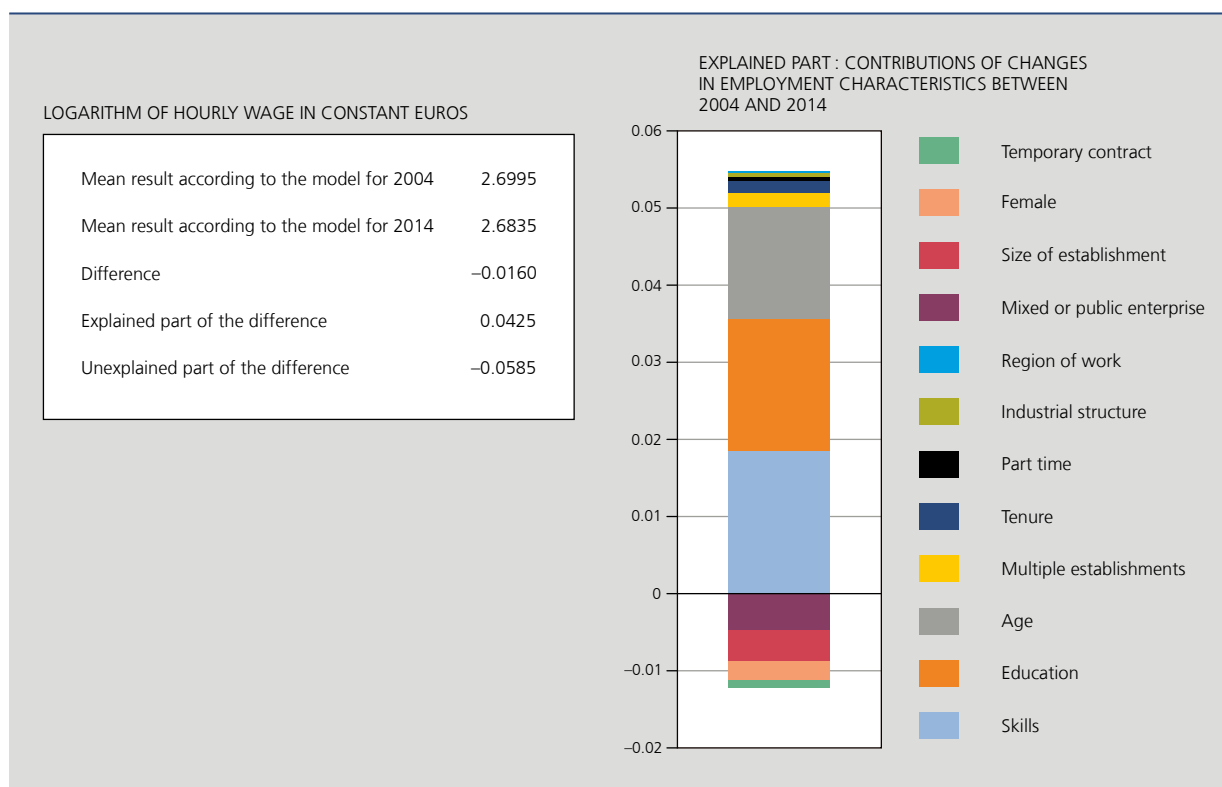
(1) Jacob Mincer pioneered the empirical studies of wage determinants.



average real hourly wages vary significantly between 2004 and 2014. It is clear that this difference is significantly greater than zero. The real gross average hourly wage declined between 2004 and 2014, largely on account of the wage moderation measures introduced during that period.

The difference between aggregate wages in 2014 and the 2004 figure is broken down into two components. The “explained” part is the share of the difference due to the change in the composition of paid employment over the period. The “residual” part can be attributed to changes in the remuneration of the characteristics during the period, but also to factors not observed in the model.

**CHART 4** BLINDER-OAXACA DECOMPOSITION



Source : Statbel.

Although we can see a slight fall in real gross wages at aggregate level, the Blinder-Oaxaca decomposition shows that changes in the composition of employment operate in the opposite direction. If the returns on the various wage determinants had remained the same (as those in 2004) over time, real aggregate wages would have increased simply as a result of the change in the composition of paid employment. That positive composition effect is due mainly to the rising level of skills and education and to the fact that employees are older, on average. The contributions of the other factors are marginal. Elements which have had a negative impact on the composition include the fact that the 2014 representative sample contains more small firms and mixed enterprises than the 2004 sample, and that the expansion of female employment also exerts downward pressure since there is still a pay gap between male and female employees.

Overall, it is the unexplained part that accounts for the developments seen, owing to both changes in the return on the characteristics between 2004 and 2014 and the change in unobserved factors.

The breakdown of the wage gap between 2004 and 2014 can also be analysed for the various deciles within the distribution, rather than just for the averages. Such an extension was proposed by Melly (2005). The results of that

breakdown by quantile are similar to those obtained from the Blinder-Oaxaca decomposition. The composition effects operate in the opposite direction from that seen for almost all deciles.

## Conclusions

The past fifteen years have seen job polarisation in Belgium, but on a relatively modest scale compared to that in other advanced economies. Medium-skilled employment has declined, primarily in favour of highly-skilled jobs and, to a lesser extent, low-skilled jobs. Skills are defined here on the basis of occupations<sup>(1)</sup>, rather than educational levels.

Wage differentiation is low in Belgium. According to the OECD data, the ratio between the 9<sup>th</sup> decile and the 1<sup>st</sup> decile was 2.4 in 2015. Only Italy and Sweden exhibited an even lower wage dispersion. Moreover, wage inequality has tended to diminish in Belgium over the past decade, whereas it has grown in the United States, the Netherlands, Denmark and France.

According to data from the Structure of Earnings Survey, real wages declined slightly in Belgium between 2004 and 2014. The fall was most marked in the case of the least-skilled jobs, but was also evident for the highly-skilled and, to a lesser extent, the medium-skilled.

The difference in mean wages for 2004 and 2014 was broken down according to the Blinder-Oaxaca technique in order to identify the effect of changes in employee characteristics over the period. The decomposition shows that these composition effects had a positive impact on the movement in wages. Since we find that real wages have fallen slightly, this means that other factors (“residual effect”) counteracted those composition effects. If we perform a similar breakdown for the quantiles, we obtain a similar result.

As regards economic policy recommendations, the polarisation (observed at least in employment) raises the question of worker mobility and reallocation. Labour market policies must make it as smooth as possible for employees in medium-skilled occupations to retrain in other sectors of activity or other segments of the labour market. The matching of vacancies to workers is benefiting from the digital revolution and should also be more efficient than in the past. Vocational training certainly has a role to play in fostering this transformation of the labour market. In all countries, but particularly in Belgium, there are substantial differences in participation in continuing training depending on the educational level. Redistribution measures also need to be adjusted to ensure that the gains of automation and digitalisation are shared as fairly as possible in order to support employees displaced to the least-skilled segment, including workers other than those with employee status (i.e. the low-skilled self-employed and similar groups).

(1) However, the content of occupations also changes over time. That is why the standard classification of occupations is regularly revised. Nonetheless, occupations offer an imperfect way of measuring skills.

## Bibliography

- Autor D., F. Levy and R. Murnane (2003), "The Skill Content of Recent Technological Change: An Empirical Exploration", *The Quarterly Journal of Economics*, 118(4), 1279-1333.
- Cerina F., A. Moroz and M. Petersen Rendall (2018), *The Role of Gender in Employment Polarization*, mimeo, February.
- Charnoz P., E. Coudin and M. Gaini (2011), *Wage inequalities in France 1976-2004: a quantile regression analysis*, DESE working paper 2011/06, Insee.
- Cozzi G. and Impullitti G. (2016), "Globalization and wage polarization", *Review of Economics and Statistics*, 98(5), 984-1000.
- D'Haultfœuille X. and P. Givord (2014), "La régression quantile en pratique", *Économie et Statistique*, 471.
- De Mulder J. and C. Duprez (2015), "Has the reorganisation of global production radically changed demand for labour?", NBB, *Economic Review*, December, 71-86.
- Feenstra R. and G. Hanson (1996), "Globalization, Outsourcing, and Wage Inequality", *American Economic Review*, 86(2), 240-245.
- Goos M., A. Manning and A. Salomons (2014), "Explaining Job Polarization: Routine-Biased Technological Change and Offshoring", *American Economic Review*, 104(8), 2509-2526.
- Goos M. (2018), "The impact of technological progress on labour markets: policy challenges", *Oxford Review of Economic Policy*, 34(3), 349-361.
- Jann B. (2008), "The Blinder–Oaxaca decomposition for linear regression models", *The Stata Journal*, 8(4), 453-479.
- Melly B. (2005), "Decomposition of differences in distribution using quantile regression", *Labour Economics*, 12, issue 4, 577-590.
- OECD (2018), *OECD Employment Outlook 2018*, Paris.
- Van den Berge W. and B. Ter Weel (2015), *Baanpolarisatie in Nederland*, CPB Policy Brief, 2015/3.
- Verdugo G. (2017), *Les nouvelles inégalités du travail*, Paris: Les Presses de SciencePo.

# Recent international trends in corporate taxation : more competition or more convergence ?

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S. Van Parys

## Introduction

The international corporate taxation environment is rapidly changing. In recent times, a number of countries have lowered their tax rates or plan to do so. In addition, there have been moves to combat the erosion of the tax base and tax-motivated profit shifting.

In that context, a reform of the Belgian corporate tax system was conducted in December 2017, leading to abandonment of the strategy of tax niches based on preferential regimes, combined with relatively high nominal tax rates. The Bank published a study on the budgetary and macroeconomic aspects of the corporation tax reform in Belgium on 6 December 2017.

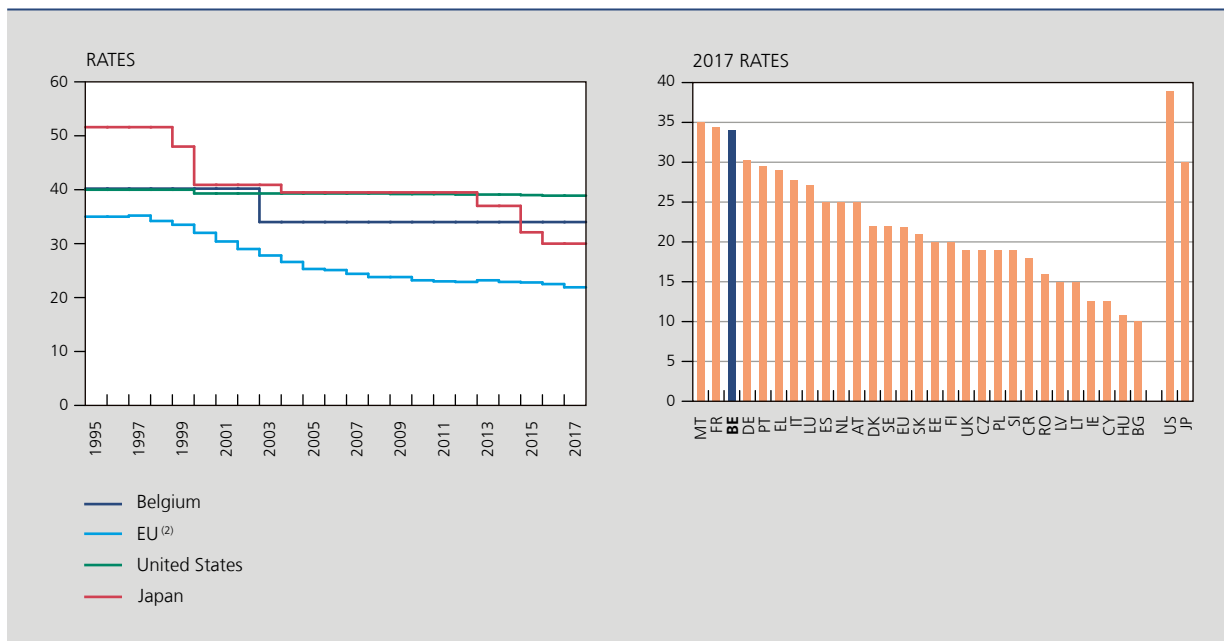
This article presents a brief description of that reform and a detailed analysis of the international corporate taxation environment. Section 1 describes changes in corporate tax rates and revenues. Section 2 examines the most important lessons to be drawn from the economic literature on the subject. Section 3 sets out the measures taken at international level to combat profit shifting and other practices which are eroding the tax base, in order to prevent corporate tax avoidance. Section 4 outlines the reforms to corporate tax regimes in Belgium, in the other EU Member States and in the United States. Section 5 puts forward a number of policy recommendations. Finally, the article ends with the main conclusions.

## 1. Corporate taxation from an international perspective

### 1.1 Rates

The downward trend in corporate tax rates in Europe is undeniable, as the average nominal tax rate in the EU has fallen steadily, declining from 35 % in 1995 to 21.9 % in 2017.

**CHART 1** NOMINAL CORPORATE TAX RATES<sup>(1)</sup>: DOWNWARD TREND AND SIGNIFICANT DEVIATIONS



Source: EC.  
 (1) These are the highest statutory tax rates, including any local or regional taxes on corporate profits.  
 (2) Unweighted average.

The downward trend in tax rates was most evident during the period preceding the economic and financial crisis. In the EU, the nominal average rate of corporate income tax dropped from 32 % in 2000 to 23.8 % in 2008. After that, it stabilised overall at around that level, as some countries increased their rates while others cut them.

Lately, it seems that rates have begun falling again. In 2016, Denmark and Spain cut their respective nominal rates to 22 % and 25 %. In 2017, the rate dropped to 24 % in Italy, 27.1 % in Luxembourg, 21 % in Slovakia, and 18 % in Croatia, while in Hungary it was halved to 10.8 %. Furthermore, the rate continued to fall in the UK, dropping to 19 % in 2017, compared to 30 % ten years previously.

There is every reason to expect the downward trend in nominal tax rates to persist in the years ahead in many European countries. Apart from Belgium, reforms are planned in the Netherlands, France and Luxembourg. These reforms are discussed in section 4.

There are wide variations in the maximum nominal rates of corporate income tax between the EU Member States. Malta has the highest nominal rate of tax on corporate profits, at 35 %. At the other extreme are Ireland, Cyprus, Hungary and Bulgaria. This last country charges a nominal rate of barely 10 %. In Belgium, the nominal rate was 33.99 % in 2017, the third highest tax rate in the EU, after Malta and France. In that same year, the unweighted EU average was 21.9 %, as already stated.

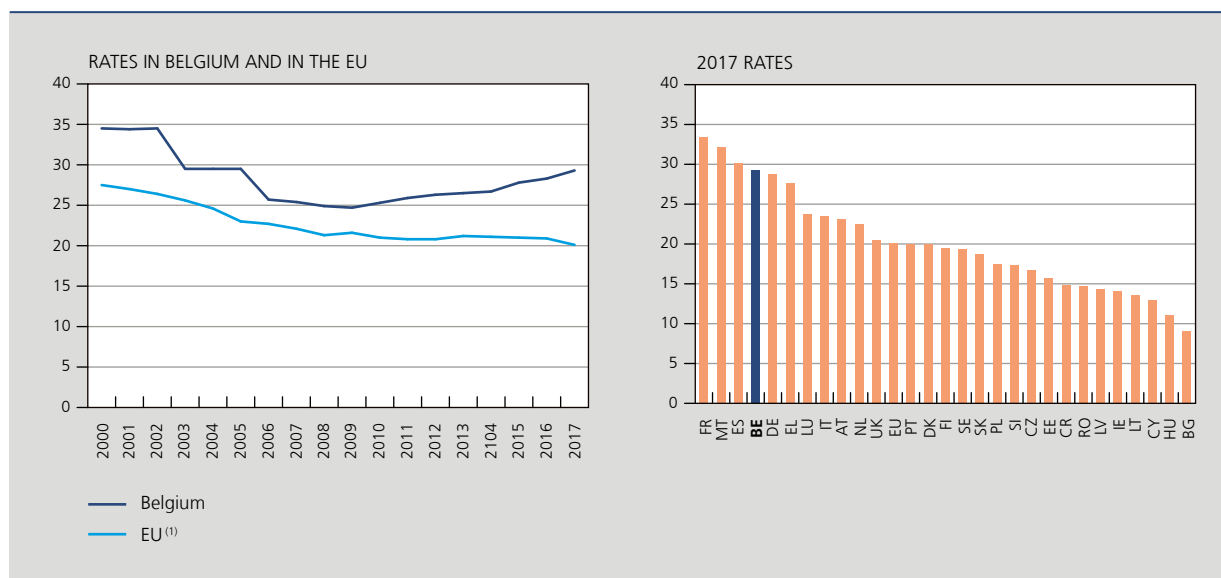
Compared to the United States and Japan, nominal corporate income tax rates in Europe are low. In 2017, the nominal rate in the United States stood at 38.9 % while in Japan it was 30 %. Both apply a system of imputation, i.e. multinational companies are taxed in their country on the whole of their profits, wherever they were made. However, companies can obtain a tax credit for taxes paid in other countries.

Nevertheless, a list of the highest nominal rates in various countries provides only a partial picture of the real tax burden on companies, because the corporate tax charged may vary greatly from one country to another depending on tax breaks, depreciation methods or the existence of preferential regimes. The real rates of tax calculated on the basis of tax legislation therefore provide a more accurate picture of the effective tax burden.

The real tax burden on companies is lower than the nominal tax rate in almost all EU countries. In Belgium, for example, the difference between the nominal tax rate and the average effective rate came to almost 5 percentage points in 2017, as the Belgian government's policy combined a relatively high nominal tax rate with a fairly small tax base.

**CHART 2** AVERAGE EFFECTIVE CORPORATE INCOME TAX RATES

(in % of the tax base before tax breaks)



Source: ZEW.

(1) Unweighted average.

## 1.2 Corporate income tax revenues

The decline in nominal rates of corporate income tax, sometimes likened to a “race to the bottom”, is due to the lack of a coordinated European policy, which has led some Member States to design strategies aimed at attracting international investment or capital by manipulating nominal tax rates, the tax base or exemption rules.

Although almost all European countries have, to a large extent, cut their nominal corporate tax rates in recent decades, the real consequences of those reductions need to be qualified.

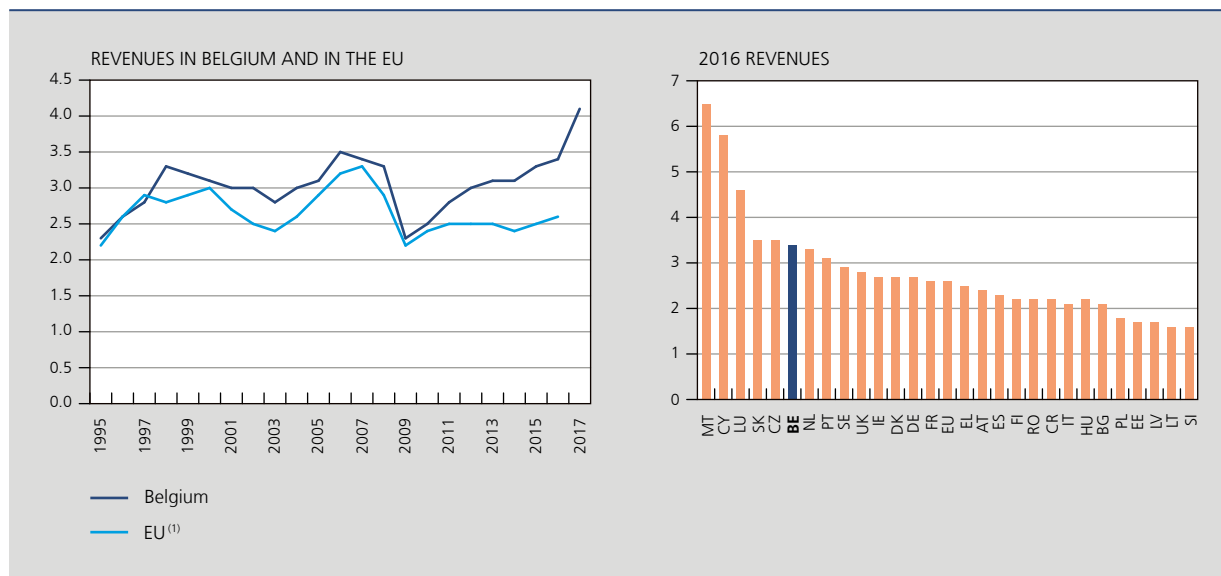
For instance, despite this decline in nominal rates, the average corporate tax yield as a ratio of GDP has not fallen in the EU. On the contrary, these tax revenues, which naturally depend on the economic situation, increased from 2.2 % of GDP in 1995 to 2.6 % in 2016. In Belgium, the rise was even more marked, since the figure increased from 2.3 % of GDP in 1995 to 3.4 % in 2016. In 2017, corporate tax revenues actually reached a historically high level of 4 % of GDP.

This shows the considerable expansion of the tax base over that period. However, on the basis of the available data on the net operating surplus, it cannot be said that this expansion accounts on its own for the rise in corporate tax revenues. This suggests that the nominal rate reductions were also accompanied by enlargement of the basis used to calculate the tax. In practice, this means that compensatory measures were taken, such as the abolition of certain tax breaks or preferential regimes granting tax concessions. The fact that the lower tax rates have not led to any significant fall in corporate tax revenues is also due partly to the greater number of conversions into companies<sup>(1)</sup>, a higher proportion of income from

(1) For members of the professions and other self-employed persons, conversion to a company means pursuing their occupation via a company. That often enables them to reduce – perfectly legally – the tax charged on their activities.

**CHART 3** CORPORATE INCOME TAX REVENUES

(in % of GDP)



Sources: EC, NBB.  
(1) Weighted average.

capital and a decline in interest rates which has reduced the allowances for interest charges. That information could also indicate that tougher and more successful action is being taken against tax avoidance and tax evasion.

Finally, it seems that some relatively small European countries with low tax rates still obtain quite substantial revenues from corporate taxation. That applies, for example, to Cyprus and Ireland, and appears to demonstrate that those countries are managing to attract tax bases by charging low rates.

## 2. The optimum corporate income tax from a theoretical point of view

The optimal tax theory examines the impact of taxes on the social welfare of an economy, resulting from both the scale of economic activity and its distribution among households. In that regard, the analysis makes no sense unless the tax system is considered as a whole, since individual taxes such as corporation tax can only be assessed in the light of other taxation. That theory does not say anything about the desired level of taxation and takes the proportion of public expenditure funded by taxes as given. Apart from theoretical considerations, when devising the optimum tax regime it is also necessary to take account of practical constraints, such as how the taxes are administered, from the point of view of both the government and the taxpayer. This section discusses corporate income taxation from a theoretical viewpoint, first in the context of a closed economy and then in an open economy.

### 2.1 Corporate income tax in a closed economy

In a closed economy, capital and profits cannot cross borders and it is therefore not so easy to avoid the tax due on them. In that context, in order to understand the welfare implications of a tax on capital incomes, it is necessary to examine the impact on both economic efficiency (the scale of economic activity) and on redistribution.

At first glance, taxing capital incomes is not optimal from the point of view of efficiency. Such a tax in fact penalises future consumption as opposed to current consumption and therefore disrupts the intertemporal neutrality of consumer choice. This results in sub-optimal savings and consequently a reduction in investment. Simple exogenous and

endogenous growth models show that a tax on capital incomes leads to lower investment and a reduced capital stock, and hence slower economic activity and growth.

However, more sophisticated theoretical models reveal that taxing capital may make sense after all from the point of view of efficiency. First, taxing the pure economic rent proves optimal. This is the return in excess of the minimum that investors expect on the financial markets, taking account of a risk-free yield and a risk premium. While this minimum return should preferably be exempt, taxing the excess return does not result in distortion of consumption or investment decisions, because a higher return is a sign of market power, as in the case of monopolies, or location advantages, and is not the reward for economic effort. Partial taxation of the total capital return, which is much simpler to administer than a tax on the pure economic rent, may be seen as an approximation of a tax on the pure economic rent.

Next, a tax on capital incomes may be desirable to offset other distortions, such as those resulting from the taxation of labour incomes. The latter may reduce the return on investment in human capital (education, training), especially if it is progressive. Imposing a tax on capital incomes, too, means less disruption of consumer decisions to save or invest in training. Another argument for taxing capital incomes, and consequently discouraging future consumption, is that, on average, the preference for leisure increases – or the labour supply becomes smaller – with age. Insofar as consumption and leisure are complementary, a tax on consumption means an implicit tax on leisure, and it reduces the distortion of the choice between leisure and (taxed) labour. The taxation of capital incomes, which discourages future consumption, thus permits an implicit tax on leisure at a more advanced age, or an implicit subsidy for the labour of older persons.

A tax on capital incomes may also be advocated from the point of view of redistribution. A tax on labour incomes is in principle the most appropriate redistribution method because those incomes are an accepted approximation of the ability to earn money. However, capital incomes may also be an indication of that ability, as some people are more capable than others of increasing the return on their investments. A tax on capital therefore leads to a redistribution from those with greater earning capability to those with less capability. Levelling out differences in initial wealth may be another reason for taxing capital incomes, but is only desirable if the inheritance tax on unintentional inheritances does not yield the expected results.

Although there are clearly reasons for taxing capital incomes, the question is whether, in a closed economy, that tax should preferably be levied on the company or on the shareholder, via personal income tax. Corporate taxation ensures that the tax cannot be avoided by systematically postponing the payment of profits. It can therefore be viewed as a withholding tax on personal income and an administratively effective way of ensuring that shareholders pay taxes on the profits. Another advantage of corporate taxation is that profits derived from capital are taxed in the same way, regardless of the form in which they are paid out (dividends or capital gains) and the shareholders' place of residence.

Considering that a corporate tax is desirable, box 1 discusses the best way of designing such a tax.

### Box 1 – What would the optimum corporate income tax look like ?

This box discusses the best way of designing a corporate tax, taking account of both theoretical and administrative considerations. It looks at both the ratio between the corporate tax rate and other tax rates, and at the composition of the tax base.

From an administrative point of view, it is arguable that rates of tax on capital incomes should be aligned with rates charged on labour incomes, as it is almost impossible to achieve a fair breakdown between labour and capital incomes within a company. If the overall tax burden on capital incomes is lower – i.e. taking account of both corporate tax and personal income tax – that is an incentive, particularly for self-employed persons, to replace labour incomes with capital incomes by forming a company. Moreover, labour incomes are also subject to social security contributions. Empirical studies (e.g. Goolsbee, 2004) have shown that the proportion of businesses





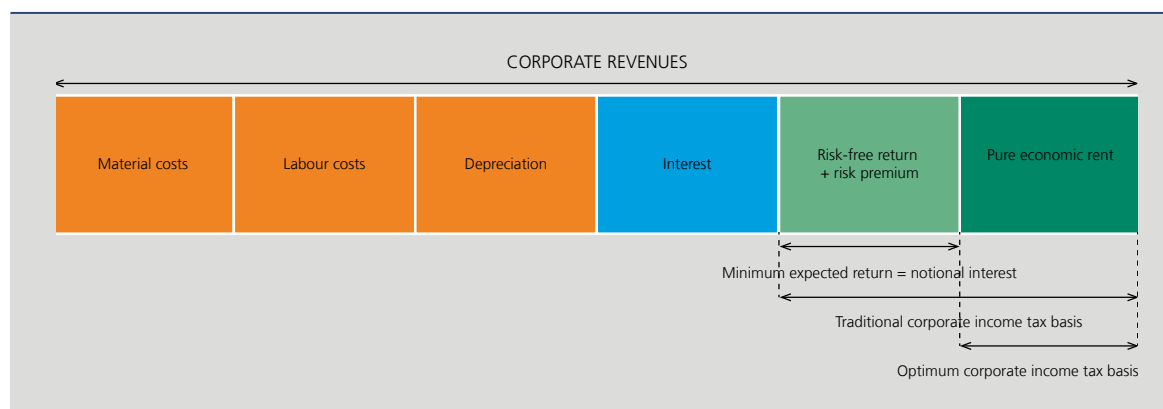
operating in the form of companies increases considerably as the corporate tax rate declines. De Mooij and Nicodème (2008) demonstrate that this helps to explain why corporate income tax revenues did not diminish in the EU between 1997 and 2003, despite the reduction in tax rates.

The principle of tax capacity is also invoked to justify an equal tax on capital incomes and labour incomes. It postulates that each euro of income should be taxed at the same rate, whatever its origin. However, this legal philosophy principle does not necessarily correspond to the principle of maximising social welfare, used in economic analysis, not even as regards redistribution. The two principles only coincide in this respect if labour and capital incomes are equally good ways of measuring earning power.

In regard to corporate taxation, in a closed economy, it is desirable for all companies to be taxed in the same way, to minimise the distortion of the allocation of resources between firms. It would only be possible to advocate lower taxes on small firms than on large ones if a defect in the market caused serious under-investment in small firms. On the one hand, positive externalities are sometimes attributed to small firms, such as job creation and innovation; on the other hand, they are said to be penalised by information asymmetry, so that investors cannot accurately assess the risk. However, there is not enough empirical evidence of this. These market shortcomings would only prevent a small group of dynamic start-ups – which often do not yet generate any profits – from investing in the optimum way. Tax incentives specifically targeting small firms would thus fail to achieve their objective. Moreover, incentives based on firm size may hamper firms' growth or lead to unnecessary hiving-off of activities. The fact that small firms incur higher administrative costs than large firms in paying their taxes is another argument in favour of granting them concessions. However, in that case, administrative simplification is more efficient than applying lower rates.

The optimum basis for charging corporate income tax corresponds to the pure economic rent. That is defined as the difference between the income from an activity and the total expenses, including the opportunity cost, of another investment presenting a similar risk. In most corporate income tax regimes, only the interest due on borrowings is deductible as an expense, while the opportunity cost of equity finance is not. That cost is the sum of the risk-free return on an investment and a risk premium; it can therefore only be determined by approximation. A system of notional interest deduction tries to take maximum account of the opportunity cost of equity. In the ideal regime, expenses which cannot be taken into account for a given year because the tax base is negative can be carried forward to another year. The tax system thus encourages entrepreneurs to take risks, and that is important for innovation.

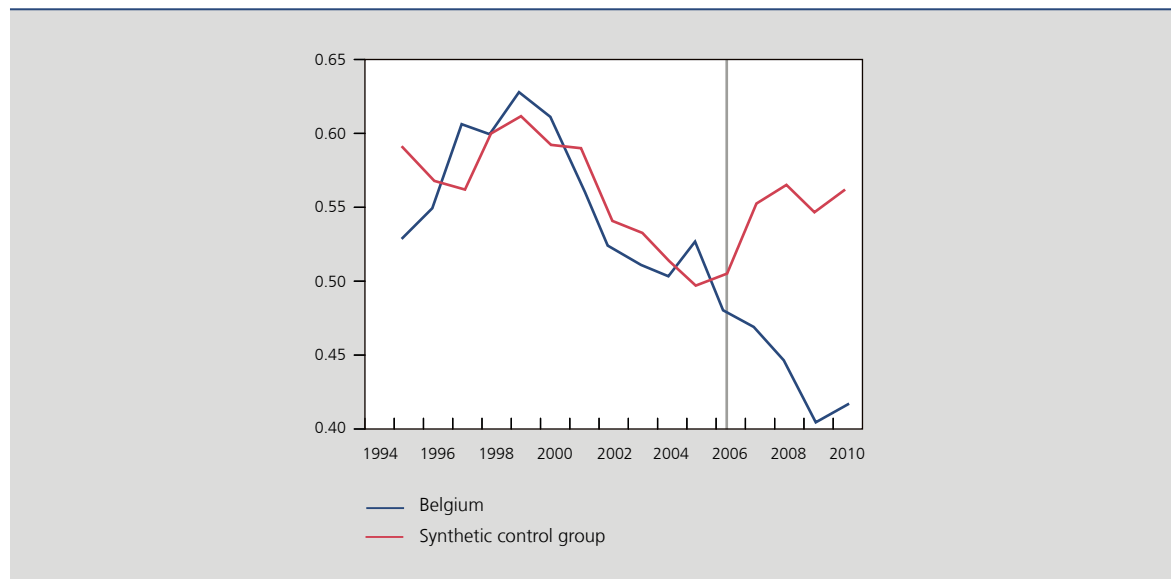
PURE ECONOMIC RENT



A tax on the pure economic rent is considered ideal because it does not distort the producer's decision on the quantity produced and the price charged. It is a way of reducing to zero the marginal effective tax rate – i.e. that rate of tax on the return that exceeds the minimum return necessary to attract capital on the financial markets – which determines the firm's decision on whether or not to proceed with additional investment. Simulations using general equilibrium models, such as those by De Mooij and Devereux (2009) and by the EC (EC, 2016e), demonstrate that the fiscally neutral introduction of a tax regime with notional interest deduction in fact leads to higher investment and stronger activity growth than a system with lower nominal tax rates but no notional interest deduction. However, the empirical evidence is less clear-cut.

If costs relating to equity capital are treated less favourably than borrowing costs, as in most corporate income tax systems, that also distorts the method of funding businesses. The debt ratios of both financial and non-financial corporations are then higher than they would be without that tax bias. Empirical studies show that corporate debt ratios thus display a positive correlation with corporate tax rates. In Belgium, the introduction of the notional interest allowance with effect from the 2007 tax year strengthened the capital situation and reduced the debt ratio of non-financial corporations. Following the introduction of this system, the debt ratio of those companies is more than 10 percentage points lower than that of a synthetic control group not granted the allowance (Hebous and Ruf, 2017). A similar, if slightly less marked, difference was seen in the case of financial corporations (Schepens, 2016).

IMPACT OF THE NOTIONAL INTEREST DEDUCTION ON THE DEBT RATIOS OF NON-FINANCIAL CORPORATIONS IN BELGIUM  
(in %)



Source: Hebous and Ruf (2017).

In addition, the tax base can be adjusted to allow for quite significant externalities which are not sufficiently taken into account by the free market.

Corporate expenditure on research and development generates significant positive externalities and leads to innovation. As a result, existing products and processes are replaced by new and better ones. It is therefore a driver of long-term productivity growth. If a firm decides to spend on research and development, it ignores the

fact that, ultimately, others may also benefit from the increased productivity via the transfer of knowledge. In the absence of additional incentives, research and development expenditure would be lower than desirable from the point of view of an economy's social welfare. That is why it is a good idea to provide grants or tax incentives for such expenditure.

There are substantial negative externalities associated with pollution and congestion. Ideally, incentives which increase them, such as tax concessions for company cars, should be avoided wherever possible.

Finally, all companies in a country should be subject to the same tax system and there should be no preferential regimes, so that competition conditions are the same for all firms, whether domestic or foreign.

## 2.2 Corporate income tax in an open economy

In an international environment, capital is mobile. Businesses can change their location, multinationals can operate in more than one country and shift their profits, and shareholders of the same company can live in different countries. Globalisation and economic integration are accentuating capital mobility. However, the taxation of capital incomes is still an essentially national competence. In an international context, countries may resort to taxes based on the source of the income or the place of residence.

If the tax is based on source, the country taxes the income generated by investments made within its borders, regardless of the investor's domicile. That applies to corporate income tax and personal income tax exemption for shareholders receiving incomes from abroad. A source-based tax may be justified to compensate for the advantages that the country offers to the business generating the income. The drawback is that it determines decisions on where to invest. In contrast, a tax based on the place of residence applies to all the income that a country's residents receive, regardless of the country where the activity generating the income takes place. That applies to personal income tax, for which a tax credit is granted in respect of taxes paid in another country. This principle may be justified by the principle of tax capacity, and has the advantage that the tax does not influence the choice of location for the activity. Nevertheless, it does require a substantial international exchange of data on investors' capital incomes.

Countries decide for themselves how to organise their tax on capital incomes. In practice, they use both corporate income tax, which is levied on business profits, and personal income tax on dividends and interest, with or without a tax credit or exemption for income derived from investments abroad. This approach creates various problems. First, the random use of multiple systems may lead to double taxation or failure to tax certain incomes. To remedy that, countries conclude agreements to prevent double taxation. Second, businesses exploit the differences between countries' tax regimes in order to reduce the effective taxation of their incomes. That behaviour is most obvious in the case of source-based corporate income tax, as the activities and profits are transferred to the countries charging the lowest taxes. Countries then become embroiled in a game of strategy aimed at attracting the biggest possible tax base: this is known as international tax competition. Third, the multiplicity of tax systems gives rise to significant administrative expense and compliance costs for firms operating internationally. It also prevents the offsetting of losses and profits within multinationals.

### 2.2.1 International tax competition in the case of corporate income taxation

The combination of international capital mobility and national corporate income tax distorts behaviour. On the one hand, it influences firms in their choice of location for investing in production. On the other hand, multinationals shift their profits.

Standard theoretical models show that – all other things being equal – firms locate their activities where the average effective corporate tax rate (i.e. the rate that takes account of the nominal rate and rules on the tax base) is lowest.

They therefore do their best to take advantage of the differences in corporate taxation between countries. Conversely, countries adopt a strategic position aimed at attracting the maximum investment by adjusting their tax rates. The advantage lies not only in increased revenues, but also in the fact that a larger capital stock enhances productivity. However, countries that do so disregard the resulting negative externality for other countries, which is reflected in capital outflows. As individual countries take no account of this detrimental spillover effect, international tax competition gives rise to sub-optimal corporate tax rates, and hence to insufficient public expenditure in all countries. This process is sometimes referred to as a “race to the bottom”. In that situation, countries may benefit from a coordinated increase in their tax rates.

However, according to sophisticated models, that does not mean that rates must be the same in all countries. Capital is less elastic in relation to tax rates in larger countries, enabling them to apply higher rates. At global level, an increase in the tax burden on capital, which will be more marked if the rate is increased in a bigger country, in fact leads to a lower equilibrium return after tax, cutting the cost of capital and therefore partially offsetting the expense resulting from the rate increase. However, Bucovetsky (2009) shows that a country has to be very small in order to gain no advantage from the coordination of tax rates. It is also evident from the literature on economic geography that, in economic clusters such as the centre or “core” of Europe, firms benefit from agglomeration rents owing to the low transport costs and positive spillover effects due to the proximity of other economic players. Governments can tax these rents without risking a capital outflow. However, that does not rule out tax competition altogether. For instance, firms will still relocate if the taxes are too high in comparison with peripheral countries. In addition, core countries can also interact. Other factors which reduce capital mobility and therefore attenuate competition between countries are advantages specifically connected with the location, such as the availability of certain commodities, infrastructures or skilled labour, and the preference for investing in one’s own country because of advantages in terms of information.

As well as moving the location of investment in production, multinationals can exploit differences between tax systems by shifting their profits to the countries with the lowest nominal corporate tax rates. Although the tax due results directly from investment, firms have access to devices for separating the two. Theoretical models which take account of the mobility of profits without the relocation of the physical capital produce results similar to those in which the physical capital is mobile. Here, too, the equilibrium rate is lower for small countries, as a lower tax rate causes them to lose relatively less revenue from their small tax base while securing them quite significant gains via the taxable profits that they attract from the rest of the world. The application of a uniform tax rate in two competing countries will harm the small country, but a minimum rate will promote the welfare of both countries. The difference in relation to physical capital competition models is that the relevant rate here is the nominal rate, and not the effective tax rate; in fact, profit shifting has no impact on the treatment relating to the tax base.

Multinationals have various ways of shifting their profits. These techniques can be roughly divided into two categories, namely manipulation of transfer prices and modification of the funding structure.

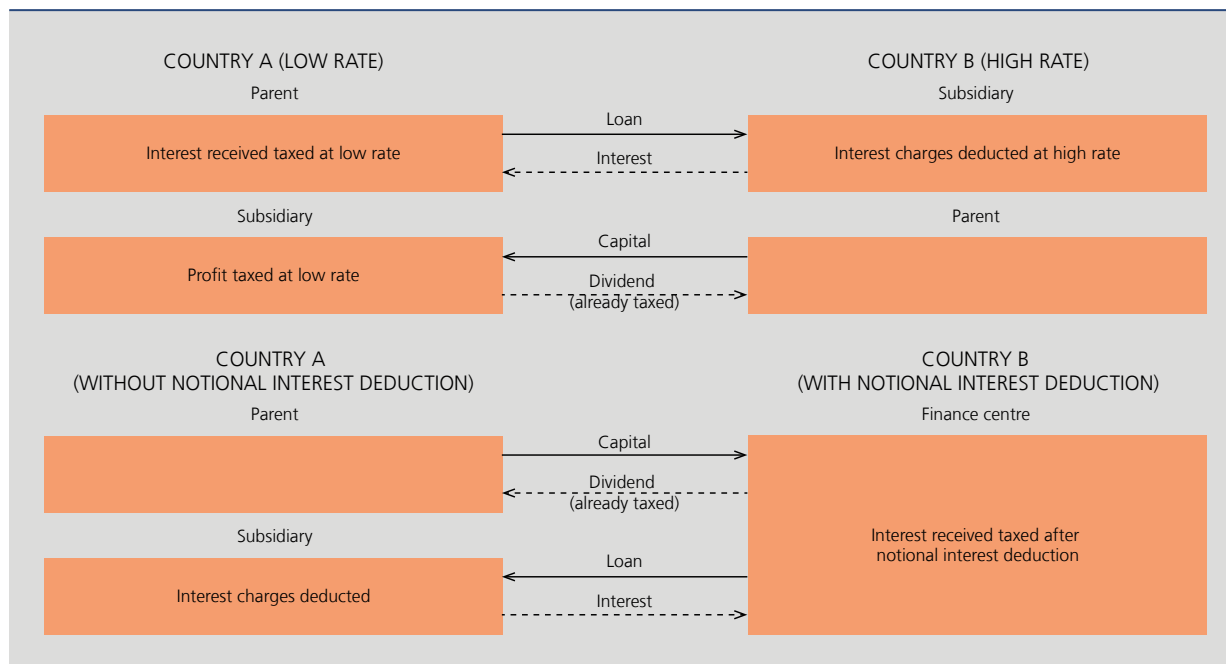
On the one hand, the transfer price represents a cost for the firm receiving a particular product, service or right, which reduces its profit, while on the other hand it constitutes income for the firm supplying that product, service or right, which increases its profit. It is in the interests of multinationals to manipulate transfer prices so as to increase the profits of firms based in countries charging a low rate of tax, and to reduce the profits of those located in countries where the tax rate is high. In the case of everyday goods and services, it is possible to check whether the transfer price conforms to the market prices charged between unrelated companies. However, for some goods and services, particularly intangible ones such as brand names and property rights, there is no market. Multinationals manage to avoid tax by locating the property rights in a country charging a low corporate tax rate or applying a favourable regime to income from intellectual property, regardless of whether the activities pursued in that country contributed to the acquisition of the intellectual property, and artificially inflating the dues paid by establishments located in countries with a high tax rate. It is also possible for multinationals to allocate their overheads in a favourable way.

Adapting the corporate funding structure may also be a way of avoiding tax. In that case, it exploits the fact that, in most corporate tax systems, interest on borrowings can be deducted from taxable profits, unlike the opportunity cost of capital (notional interest). It is then advantageous to finance subsidiaries in other countries with borrowings if they are located in a country that charges a relatively high rate of tax, and to use equity capital if they are located in a country where the tax rate is fairly low. In that context, the crucial point is that the dividend paid within the group of companies

is presumed to be taxed in the country of the company which is paying it. That is the case in most countries, and notably in Belgium with the deduction of dividends received (RDT/DBI).

If a country also has a system allowing the deduction of notional interest on the capital, the scope for tax avoidance is even greater. Multinationals can optimise their taxes by establishing finance centres endowed with extremely high capital, whose main activity consists in granting loans to other establishments in the same group. That enables them to reduce their tax bill while benefiting from the deduction of notional interest in the country operating that regime, and the deduction of borrowing costs in the countries where the other establishments are located.

**CHART 4** PROFIT SHIFTING BY MODIFICATION OF THE FUNDING STRUCTURE



### 2.2.2 How to avoid the negative effects of international tax competition ?

Opinions are apparently divided on whether it is necessary to harmonise tax systems or coordinate corporate taxation in order to combat the distortions of behaviour caused by international tax competition, or whether a high degree of tax competition is desirable.

Apart from the externalities that appear between countries autonomously deciding their taxation policy, there are other distortions specific to the centralised or decentralised character of decision-making which must likewise be taken into account when assessing the taxation policy of different countries. Unlike the usual tax competition models, “public choice” theory assumes that policy-makers maximise their own objectives rather than the welfare of the population. Decision-makers who are not benevolent could choose to increase tax revenues as much as possible rather than welfare. Tax rates would then be higher than desirable. In that case, international tax competition could lead to lower tax revenues. However, it is hard to say whether that would result in the optimum level of taxation from a welfare point of view.

According to the fiscal federalism theory, the combination of government revenue and expenditure should ideally reflect the population’s preferences as far as possible, with the national legislative authorities in principle being better informed than the supranational legislative authorities. The “second-generation” theory of fiscal federalism focuses on the information asymmetries between politicians and the population. In that regard, decentralised decision-making would increase the responsibility of the decision-makers. According to the “yardstick competition” model, in the absence of better information the voters base their view on the results obtained in other jurisdictions to assess their government’s

policy, and that increases their government's responsibility and encourages it to work more efficiently. That theory is primarily relevant in the case of local jurisdictions with few differences of language and culture, where much more information is exchanged than between countries. However, the fiscal federalism theory also states that if the policy has significant spillover effects on other jurisdictions, it is preferable for decisions to be coordinated. That is particularly true in the case of capital taxation, where these effects are considerable in view of the increasing international mobility of capital and profits, as explained in detail above.

In view of the substantial spillover effects, which have also been clearly demonstrated empirically, close international coordination of corporate taxation seems advisable, in terms of both the tax base and the rate charged.

As regards the tax base, what is needed is harmonisation that limits the scope for profit shifting, making the tax base correspond to the economic rent – in accordance with the principles set out in box 1 – and taking consistent account of the positive externalities of investment in research and development. Profit shifting can be limited by attributing the profits to the countries where the activity generating them is located. That can be done by using formulas which take various factors into consideration, as in the EC proposal for a common consolidated corporate tax base (CCCTB) (see section 3). Countries can also conclude agreements on transfer prices and limit the scope for adjusting the funding structure for tax planning purposes, as is done in the OECD (again, see section 3). Agreements on the tax treatment of intellectual property rights and tax incentives for expenditure on research and development can reduce profit shifting and promote innovation. Finally, the harmonised introduction of a notional interest deduction scheme including rules to prevent abuse and a system of consolidating profits and losses within groups of companies would help to minimise the influence of corporate tax on entrepreneurs' investment decisions.

It would also be a good idea to coordinate corporate tax rates to some degree, in the form of a minimum rate. It is less effective to harmonise the tax base if the rates are not harmonised: the distortion relating to decisions on where to invest in production still exists and could even increase.

Harmonisation and coordination measures should preferably involve as many countries as possible. The impact often can only be favourable to them all if they all actually collaborate. That is what makes these initiatives intrinsically fragile.

A more fundamental reform would consist in switching from a system of taxation based on source to taxation based on residence. Disappearance of the tax based on source would also eliminate the scope for exploiting tax differences between countries. However, such a reform would entail technical problems, as it could drive firms to postpone the repatriation of profits to shareholders. It would also require a substantial international exchange of data on the capital incomes of investors. In recent years, some significant steps have been taken in that direction, such as the abolition of banking secrecy.

A third reform option, put forward for long-term consideration, would be to replace the current system of taxation based on source or residence with a system of taxes based on destination. This system would tax corporate profits in the place where the products are sold. It would be very similar to a VAT system, the main difference being that labour costs would be deducted from the tax base so that only the profits would be taxed. Such a system would not influence decisions on the location of firms and would offer far less scope for profit shifting. Like a tax based on the place of residence, however, a tax based on destination would abolish the principle of remuneration of the producer country, specific to taxation based on source.

### 3. Recent international cooperation initiatives concerning corporate taxation<sup>(1)</sup>

The aim of coordination and cooperation in regard to corporate tax is nothing new. This section reviews developments in that sphere before discussing a number of recent European initiatives on that subject.

#### 3.1 Review of initiatives

Like other direct taxes, corporate taxation is an autonomous competence of the EU Member States, though they have to respect the rules of the Single Market, such as the restrictions on state aid. Since the EEC was founded, there have been

(1) On the basis of the information available when the text was finalised on 19 September 2018.

numerous initiatives aimed at harmonising corporate tax. Despite the many proposals, there has been no harmonisation at EU level<sup>(1)</sup>.

In view of the Member States' reluctance to harmonise corporate tax, the EC has adopted a pragmatic position over the years, opting for a two-pronged approach. In the long term, it works on measures to achieve a harmonised tax base for companies operating across borders in the EU, and in the short term it focuses on targeted measures which remove certain tax barriers for multinationals and prevent any harmful tax competition. For example, there have been measures to avoid double taxation (directive on relations between parent companies and subsidiaries, directive on mergers), a list of harmful tax regimes (leading to abolition of the coordination centres in Belgium), and the Joint Transfer Pricing Forum, which advises the EC on transfer pricing issues. In 2001, the Commission had tabled a new proposal for a common consolidated corporate tax base (CCCTB). This method should enable international companies to calculate their tax base at group level before apportioning it according to a formula between the Member States, which would apply their own tax rates. In 2011, after ten years of work, this initiative led to a draft Directive on which the Member States have yet to agree.

In the wake of the economic and financial crisis and various revelations about tax avoidance and tax evasion, the need to step up the coordination of corporate taxation has returned to the forefront in recent years. By means of aggressive tax planning, some companies in fact manage to shift profits to countries where they pay little or no tax, or to erode the tax base.

In 2013, in view of the keen interest in the issue of tax base erosion and profit shifting, and thanks to the political will to address these problems, the OECD succeeded – with the support of the G20 – in launching its Base Erosion and Profit Shifting (BEPS) project. In a time span of two years, no fewer than 13 reports were produced, culminating in a set of recommendations, new international rules and good practices which should ensure that profits are taxed at the place where the value added is actually created. Annex 2 to this article lists the 15 action points in the BEPS project. Although the components of the BEPS action plan are not legally binding, they have been largely approved by the OECD members and by the G20, and by a number of developing countries and other players (including the IMF and the World Bank). Those countries are therefore expected to take the necessary steps to solve the problem of base erosion and profit shifting, and to implement the OECD recommendations in that sphere.

In that context, various new initiatives have also been adopted at the European level in recent years in order to create a fair tax system with particular emphasis on the taxing of profits. They largely take account of the conclusions of the work on the BEPS project by the OECD and the G20, to which the EC also made an active contribution. The member states considered it important to coordinate the implementation of the BEPS action plan in the EU, in order to ensure that the operation of the single market is not additionally distorted by divergences in the interpretation and application of these recommendations on the part of the Member States.

A number of European measures discussed below should in the short run provide a solution to the problems of tax avoidance and tax evasion. By relaunching its CCCTB proposal, the EC is also working on a long-term solution which should tackle the roots of the problem of base erosion and profit shifting (BEPS) and ensure that profits are taxed where they are generated.

### 3.2 Examination of preferential regimes

In recent years, a number of preferential tax schemes applied by the Member States have been examined in connection with fair corporate taxation. The Code of Conduct Group on Business Taxation is a key instrument here. It establishes a code of conduct which comprises an overview of harmful tax measures and is intended to create fair competition in the corporate taxation sphere. Member States adopting this code undertake to abolish or reform tax measures considered harmful (*rollback*) and not to introduce them in the future (*standstill*).

(1) The Neumark Committee (1962) and the Van den Tempel Report (1970) both advocated the harmonisation of corporation tax rates. This last report eventually led in 1975 to a proposal for a Directive on the harmonisation of the corporation tax rate by alignment of the rates within a range of 45-55%. However, the European Parliament considered that an agreement on harmonisation of the tax base was needed first. In 1988, the EC submitted a proposal for harmonisation of the tax base, but it was rejected by a number of Member States. In 1992, a new harmonisation proposal was launched by the Ruding Report, recommending a minimum standard for the tax base and minimum and maximum rates of corporation tax (30% and 40% respectively). These proposals also failed.

At the request of the Ecofin Council, this Code of Conduct Group has, in recent years, analysed the Member States' preferential tax schemes for income derived from intellectual property (*patent boxes*), while the EC, via its competition policy, and more specifically by examining illegal state aid, checks whether the Member States' tax rulings – i.e. the agreements between the tax authorities and certain firms on the way in which corporation tax law is applied – conform to the rules on state aid.

### ***Favourable tax treatment of income derived from intellectual property (patent boxes)***

In the wake of the OECD/G20 BEPS project, the Code of Conduct Group decided, following examination, that the Member States' "patent boxes", or in other words tax regimes creating a tax advantage for income derived from intellectual property, need to be modified to conform to the (adapted) Nexus approach. That decision was endorsed by the Ecofin Council in December 2014.

According to the Nexus approach, an advantageous tax regime for income from intellectual property can only apply if the activities aimed at acquiring intellectual property are actually conducted by the entity concerned. To judge whether the entity actually carried out sufficient activities, the expenditure on research and development (R&D) is used as an approximation. In practice, the tax advantage has to depend on the Nexus fraction, which corresponds to the ratio between the amount spent on R&D by the company itself (or expenditure outsourced to an unrelated company) and the total amount that has been spent on developing or buying the intellectual property.

After examination by the Code of Conduct Group on Business Taxation, it emerged that none of the patent box regimes in force in the Member States conformed to the Nexus approach. The Code of Conduct Group therefore established that the legislation of the Member States on the tax treatment of income from intellectual property needed to be brought into line with the Nexus approach by 30 June 2016. At the request of the Ecofin Council, the Code of Conduct Group verifies whether the Member States have actually adapted their patent boxes to the new Nexus approach. In the case of Belgium, both the Code of Conduct Group and the OECD consider that the new system of deducting income from innovation (replacing the tax deduction for income from patents) is not harmful.

### ***Examination of tax rulings***

Since 2014, the EC has demanded information on Member States' tax rulings and examined whether those advance rulings constitute unlawful State aid. In some cases, the EC has decided to open a formal inquiry into the granting of unlawful state aid; it did so, for instance, in regard to the excess profit rulings in Belgium. At the beginning of 2016, the EC judged that, in some cases, these rulings resulted in a considerable advantage for multinationals, constituting illegal state aid. That resulted in abolition of this system in Belgium and the EC's demand that the state aid wrongly granted to the companies concerned must be reclaimed. The state aid granted by way of excess profit rulings was repaid to the Belgian state in 2016 and 2017. Similarly, some tax rulings of other Member States, such as Ireland, Luxembourg and the Netherlands, were deemed by the EC to constitute illegal State aid. Formal inquiries are still ongoing against the Netherlands, Luxembourg and the United Kingdom.

## **3.3 Increased tax transparency**

The EC hopes that increased tax transparency will discourage the Member States, multinationals and other players from continuing to use certain (harmful) tax strategies, or will make them more cautious in the development of new tax strategies and measures. To achieve that, there have been important initiatives in recent years which have helped to enhance tax transparency.

In December 2015, the Ecofin Council adopted a Directive obliging the Member States, from 1 January 2017 onwards, to ensure the systematic and automatic exchange of data on advance tax rulings in cross-border cases and on prior agreements on transfer pricing. This does not only concern new or amended advance rulings on these subjects, but also all rulings passed in that sphere in the five years preceding the entry into force of the directive. Apart from the other Member States, the EC must also be informed of these advance tax rulings. This Directive forms part of a package of tax transparency measures that the EC presented in March 2015.

It should be noted that the Directive does not ban advance tax rulings: it aims to ensure that other Member States are notified of a Member State's tax rulings, via the compulsory exchange of information, and are therefore able to respond.



Previously, Member States were often unaware of this type of advance rulings: the Member State implementing the advance tax rulings could decide for itself whether or not to inform other Member States.

Multinationals also need to demonstrate greater transparency. In May 2016, a Directive was adopted obliging multinationals with a consolidated group revenue of € 750 million or more, and established in the EU or conducting business there (via EU-based entities), to submit a report for each country with effect from 2017, disclosing certain information each year for each tax jurisdiction in which it operates. This country-by-country reporting supplements the master file which contains information on the group's global activities, intra-group operations and transfer pricing policy, and the local file containing data on transactions with other group entities effected by the entity or entities located in a Member State, and the prices charged. In addition, this directive requires the Member State in which the group has to submit its country-by-country reports – generally the Member State in which the group's parent company is located – to exchange automatically the data contained in the country-by-country reporting with all Member States in which the group has an entity or permanent establishment, so that those countries have a complete picture of the group. The greater transparency demanded of multinationals is in line with the recommendations of the OECD/G20 BEPS project as regards the documentation of transfer prices.

The Ecofin Council and the European Parliament are currently examining a proposal for introducing public country-by-country reporting for multinationals active in the EU. These undertakings will then have to disclose certain information, such as where they make profits or losses, their turnover, the activities that they pursue, how many people they employ, but also where they pay tax and how much they pay<sup>(1)</sup>.

In May 2018, the Ecofin Council also approved a draft Directive which will oblige tax advisers and other intermediaries, namely anyone offering tax advice, such as accountants, lawyers, banks, etc., to disclose the complex cross-border tax structures that they set up or recommend, which may lead to aggressive tax strategies. The disclosure obligation imposed by the directive will ensure that Member States are informed at an early stage of the tax planning strategies to be implemented. Member States will thus be able to take action in good time, i.e. even before these strategies are implemented, e.g. by amending their legislation. They will also be able to target their checks specifically on set-ups which could lead to aggressive tax planning. In addition, the Directive will oblige Member States to exchange automatically with one another the information that they receive in this way, so that all Member States know about the tax planning strategies that concern them. Furthermore, this Directive forms part of the OECD/G20 BEPS action plan, in which action point n° 12 provides for mandatory disclosure by intermediaries.

### 3.4 Anti Tax Avoidance Directive (ATAD)<sup>(2)</sup>

At the end of January 2016 the EC launched a package of measures to combat tax avoidance (*Anti Tax Avoidance Package*). The ATAD formed a crucial part of the package.

This Directive, adopted by the Ecofin Council on 12 July 2016, should in principle be transposed into national law by 31 December 2018 and enter into force on 1 January 2019<sup>(3)</sup>. The aim of the ATAD is to implement a number of crucial measures to combat tax avoidance in order to provide protection against aggressive tax planning. It thus responds to the calls from various players, such as the European Parliament. Some of the measures in the ATAD also ensure that a legal framework will be created for the coordinated implementation of a number of BEPS recommendations in the Member States. In that regard, the ATAD sometimes actually goes beyond the provisions of the OECD/G20 final reports. Moreover, the ATAD aims at a common minimum level of protection against tax avoidance: Member States themselves are free to aim at a higher level of protection when transposing the directive into national law, e.g. by defining stricter threshold values.

The ATAD contains five measures which should help to ensure that profits are taxed where they are actually generated.

(1) According to the draft Directive as introduced by the EC, in regard to activities conducted in the EU, groups with a consolidated net turnover of over € 750 million have to publish the information demanded for each Member State where they operate, while in the case of activities outside the EU, aggregate reporting should be sufficient in principle, except for activities conducted with "non-cooperative" jurisdictions.

(2) Directive 2016/1164 laying down rules against tax avoidance practices that directly affect the functioning of the internal market.

(3) Except for exit taxation, which has to be transposed by 31 December 2019, for implementation with effect from 1 January 2020. In regard to limiting the deduction of interest, a transitional period is possible so long as the national regulations on this subject are just as effective as the rules in the Directive, until such time as a minimum standard is agreed in the OECD. However, the transitional period must end on 31 December 2023.

### 3.4.1 Limiting the deductibility of interest charges

The tax base may be eroded by means of excessive interest payments. For example, some multinationals arrange for group entities based in a Member State imposing high taxes on profits to record substantial interest charges via intra-group loans, so as to ensure a large tax allowance and thus to limit the tax base, while the group entity granting these loans – which therefore receives the interest income – is located in a country which charges little or no tax on profits. In order to combat such abuse, the ATAD restricts the deductibility of interest charges.

The possibility of deducting from the tax base the positive difference – also known as additional borrowing cost or net interest – between deductible borrowing costs (interest charges on all forms of debt and economically comparable costs) and the taxable interest income is limited by the ATAD to a maximum of 30 % of the gross operating surplus (EBITDA). However, the EBITDA is defined for tax purposes as excluding tax-exempt income. The ATAD specifies that Member States may include some exceptions to the rule in their legislation. For instance, deduction of net interest may still be permissible up to € 3 million, or Member States may authorise autonomous entities to continue deducting the whole of their net interest since the risk of erosion of the tax base by excessive interest arises mainly in related undertakings (notably by the use of intra-group loans).

### 3.4.2 Exit tax

The tax base may also be eroded by placing certain assets or the tax domicile outside the jurisdiction of a Member State so that the latter can no longer tax some corporate profits. An exit tax means that Member States can nevertheless still tax the profits on transferred assets at the time of exit if these profits were generated in their territory, even if they have not yet been realised. The purpose of this measure is to ensure that profits are taxed where the economic activity actually takes place. The ATAD envisages four specific situations in which the taxpayer is liable for exit tax. That is the case, for example, if assets are transferred from the head office to a permanent establishment (or vice versa) located in another Member State or in a third country, or where the tax domicile is switched to another Member State or third country. The transfer of assets between a parent company and a subsidiary is beyond the scope of the ATAD<sup>(1)</sup>.

### 3.4.3 Rule on controlled foreign companies (CFCs)

Some multinationals transfer their profits from their parent company to a controlled foreign company in order to take advantage of a low or zero rate of corporate tax. However, under certain conditions the CFC rule allows those profits to be taxed in the Member State of the parent company by adding them back into its tax base.

Under the ATAD, an entity or permanent establishment whose profits are not taxed in the Member State of the parent company is a controlled foreign company (CFC) of the taxpayer if the latter, directly or indirectly, holds more than 50 % of the capital or voting rights, or is entitled to receive more than 50 % of the profits, and if the controlled foreign company pays “little” tax. That is the case if the effective corporate tax paid by the CFC in another country is less than the difference between the corporate tax that it would have paid in the Member State of the taxpayer and the corporate tax actually paid, or in other words, if the latter is less than half the tax rate in the taxpayer’s Member State.

If these two conditions are met, some of the CFC’s income can be added to the taxpayer’s tax base.

### 3.4.4 Conflicts arising from hybrid mismatches

Hybrid mismatches are situations in which financial entities or instruments are classified differently in the respective national laws of two countries (or in tax treaties). These mismatches are abused for the purpose of aggressive tax planning techniques, so that some elements avoid tax.

The ATAD offers a solution for a number of classification differences arising from hybrid mismatches. In the case of double deduction, i.e. where costs are deducted from the tax base in both Member States, the deduction is granted

(1) The transfer of assets between a parent company and a subsidiary, i.e. two entities with their own legal personality, can in fact be considered a legal transfer of ownership (sale) so that the transfer pricing rules apply. The transfer of assets to a permanent establishment, which can be defined in simplified terms as a foreign establishment (e.g. a factory or branch) of the parent company, without its own legal personality but subject to tax on its activities in another country, is not always considered a legal transfer of ownership having income as its counterpart.

only in the Member State of origin of the payment. Where a particular element is deducted from the tax base in one Member State without being added to the tax base in another Member State, the Member State where the deduction is made must reject it.

The original ATAD, which only provides a solution for hybrid mismatches between two Member States, has now been revised. The ATAD II was adopted in May 2017 and has to be transposed by the Member States by 31 December 2019. The ATAD II extends the rules on hybrid mismatches to non-EU countries and its definition of conflicts arising from hybrid mismatches is broader than in the original ATAD.

### 3.4.5 General anti-abuse clause

This clause can be deemed to supplement the specific anti-abuse measures and acts as a safety net for cases where certain artificial tax structures designed to avoid tax nevertheless fall outside the scope of the specific anti-abuse measures. This clause enables the Member States to stop such abuse resulting from structures of that type by disregarding them when calculating corporate tax. The ATAD defines an artificial structure as one which has no commercial motivation and does not reflect economic reality.

## 3.5 Other measures aimed at fairer and more effective corporate taxation in the EU

Apart from the ATAD, examination of preferential regimes and increased tax transparency, the EU has taken a number of other measures in recent years to make corporate taxation fairer and more effective.

### 3.5.1 Common external strategy – list of non-cooperative jurisdictions for tax purposes

A key component of the common external strategy is the establishment at EU level of a list of third countries which can be considered non-cooperative jurisdictions (or tax havens). The EU list aims to encourage a good tax policy in those countries and thus find a solution to the impact that certain tax strategies of those countries have on tax bases in the EU.

At present, there are two lists of non-cooperative jurisdictions, namely a greylist and a blacklist. Countries or jurisdictions on the blacklist do not fulfil one or more of the EU's good tax policy criteria<sup>(1)</sup> and are not sufficiently committed to resolving the problems identified or refuse to cooperate. Countries or jurisdictions on the greylist do not satisfy one or more of the EU criteria, but have stated that they are prepared to amend their tax laws in order to conform to the said criteria, and can therefore be considered "cooperative".

These two lists were drawn up following an extensive screening process by the EC, the Code of Conduct Group and, ultimately, the Member States, and were published for the first time on 5 December 2017. Since then, these lists have already been updated three times as a result of new information notified and new commitments given by the jurisdictions concerned, the latest revision dating from 25 May 2018. There are currently seven countries on the blacklist: Guam, the US Virgin Islands, Namibia, Palau, Samoa, American Samoa and Trinidad and Tobago. The original blacklist published in December 2017 contained 17 countries.

For the moment, apart from the fact that blacklisted countries are formally referred to as "non-cooperative tax havens", entry on the EU blacklist seems to have rather limited impact, as the Member States have yet to agree on common sanctions, though they can take measures on their own initiative. However, the EC has linked the EU blacklist to the European Fund for Sustainable Development and the European Fund for Strategic Investments so that those resources can no longer benefit an entity in the countries concerned. The EC is also examining the possibility of linking the blacklist to other legislation.

Countries on the greylist are closely monitored by the Code of Conduct Group and must have made the required changes by a certain date. If they do not fulfil their commitments within the time allowed, these countries may be included on the blacklist. At present, there are numerous countries on the greylist (65 altogether), including Vietnam, the Hong Kong SAR, Peru, Thailand, the Maldives, Turkey, Qatar, the Cayman Islands, etc.

(1) These criteria are based on three pillars, namely tax transparency, fair and equitable tax competition, and the implementation of some of the BEPS project action points, such as the minimum standards specified by the OECD/G20.

The EU Member States are neither screened nor listed, as according to the EC (2017c), they are encouraged to introduce fairer corporate taxation, notably by the new rules on increasing transparency and the other measures concerning a fairer and more effective corporation tax, and those to combat BEPS.

### 3.5.2 Directive on the resolution of tax disputes

In October 2017, the Member States also reached agreement on a Directive concerning systems for resolving tax disputes arising from variations in the interpretation and application of the tax treaties, that are sometimes leading to double taxation. A key point here is that the Member States are currently subject to specific deadlines for resolving these disputes, which is helping to make the tax system fairer and more efficient. The Member States have to take the measures necessary to comply with that Directive by 30 June 2019.

### 3.5.3 Update of the “corporation tax” code of conduct

Work is also in progress on updating the Code of Conduct on Business Taxation. The aim is to adapt it to the complex international environment in which firms now operate. In that context, the Ecofin Council has also asked the Code of Conduct Group to clarify certain points and provide guidelines that take account of the BEPS recommendations.

The Code of Conduct Group’s reports to the Ecofin Council are now also published in order to make the group more visible and transparent. In that connection, an overview of all the guidelines approved by the group since 1998 was published in February 2018.

## Box 2 – Taxing the digital economy in the context of corporation tax

In recent years, the digital economy has expanded strongly, while – in some respects – corporate taxation has not been adapted to this new form of entrepreneurship. The digital economy actually has some specific features which are not taken (sufficiently) into account by the current corporate tax rules. For instance, a physical presence, at the very least a permanent establishment in the tax jurisdiction, is often a necessary condition for levying corporate tax. However, a digital business can operate perfectly well in a country without having a physical presence there. It is therefore easier for digital businesses to centralise their physical presence in a country where the rate of corporate tax is low or zero, leading to the fact that the value added is not necessarily taxed where it is created. Also, one of the main characteristics of the digital economy is that it derives its income from applying or trading intangible fixed assets, such as algorithms, patents, or user data. However, these intangible assets are often particularly difficult to value and certain elements, notably the value added created by user participation, are not always taken into account in the definition of the tax base, so that the real value added created by the digital economy is not always taxed correctly or in full. In addition, intangible assets are highly mobile, and that enhances the scope for profit shifting.

These factors are part of the reason why there is currently a significant difference between digital and traditional businesses in terms of the effective corporate tax paid. For instance, according to the EC (2018d), the effective rate of corporate tax applicable to traditional multinationals in the EU averages 23.2%, while for digital multinationals it is only 9.5%. However, it should be noted that the calculation of that effective rate also takes into account the fact that governments often grant certain (tax) concessions to digital businesses in order to stimulate their growth.

Fair taxation of the digital economy is therefore one of the points in the OECD/G20 BEPS action plan, and one of the items on the EC’s agenda.

In March 2018, an initial interim report (OECD, 2018) was produced on this subject. It clearly indicates that opinions are still divided on how to resolve this problem: it will therefore be some time yet before an international agreement can be achieved.



Although the EC advocates a global solution to this problem, it nevertheless decided to present a phased plan, in March 2018, proposing a solution within the EU. In doing so, it hopes to provide an answer for a number of Member States which are looking for a solution, as different, unilateral initiatives could distort the internal market or cause uncertainty for businesses. It also hopes that, by taking the lead, it can encourage and steer the international debate on this issue.

In its proposal for fair taxation of the digital economy, the EC likewise resorts to its two-pronged policy. Its phased plan provides for a temporary solution which can be implemented in the short term, and modification of the corporate tax rules which should be regarded more as a long-term solution.

For the EC, the best solution is to adjust the corporate tax rules in order to introduce the concept of a “digital presence”. That should enable the Member States to tax digital activities (with or without a minimum physical presence). In its proposal for a Directive, the EC therefore included the definition of a significant digital presence. Thus, a digital presence is defined as significant if, during the tax period in the Member State, revenues from providing digital services to users exceeds € 7 million, the number of digital service users exceeds 100 000, or the number of business contracts for digital services exceeds 3 000.

If a digital service provider fulfils any of these conditions, then according to the draft Directive, it has a permanent establishment in the Member State concerned (on the basis of a significant digital presence) and the firm can therefore be taxed by the Member State in question even if it not physically present. As well as adapting the corporate taxation rules in the Member States, the EC would also like to incorporate the concept of a digital presence in its CCCTB proposal.

As it will probably take some time to reach agreement on reforming the corporate income tax rules, the EC meanwhile proposes to tax a range of digital activities which are not currently taxed, as some Member States had clearly expressed their interest in that respect. The EC suggests, by way of an interim solution, levying a 3 % tax on income derived from a range of digital activities. The draft Directive aims to tax income from the publication on the digital interface of advertising specifically targeting users, the sale of user data and the provision of a digital interface enabling users to contact one another in order to exchange goods and services, for example.

This tax would only apply to firms recording global revenues exceeding € 750 million, including at least € 50 million in the EU, generated by taxable digital activities. Thus, according to the EC, these activities would be taxed pending the adjustment of the corporate taxation rules, while small start-ups would be unaffected. The tax would be levied where the digital service is used.

The Ecofin Council has not yet made a decision on these proposals.

### 3.6 Proposal for a common (consolidated) tax base

In October 2016, the EC presented specific plans for reviving negotiations on a common consolidated corporate tax base (CCCTB), which had stalled since 2011. As already stated, the aim of the CCCTB proposal is to harmonise the corporate tax base – it therefore does not concern the tax rates – and it has the advantage that a group will have to deal with only one tax authority for calculating its consolidated tax base in the EU, and not with the authorities of all the Member States in which it operates. The consolidation consists in incorporating in a single tax base the taxable result of the multinational group in the various Member States; that will make it possible, for example, to offset losses incurred in one Member State against profits made in another. The common consolidated tax base will then be apportioned between the various Member States by means of a formula in which labour (wage bill and number of employees), fixed assets and turnover will be given the same weighting, which should ensure that the profits are taxed where they are actually made. The Member States will then apply their tax rates to their share of the common consolidated tax base.

The EC has learnt from previous attempts to reach agreement on the CCCTB, and has therefore opted for a new approach. Thus, it decided to phase in the CCCTB gradually. First, the Member States are to agree on a common corporate tax base (CCTB). Only in a second stage will they have to agree on a common consolidated corporate tax base (CCCTB). In the past, work on the CCCTB has shown that some points, such as consolidation, gave rise to difficult discussions which would delay progress on other aspects. In addition, a number of substantive rules and provisions included in the 2011 draft (which has since been withdrawn) were likewise revised, supplemented or deleted in order to take maximum account of the work already done for the purpose of introducing fair and efficient corporate taxation.

Taking account of the draft Directive(s) put forward by the EC, the C(C)CTB would be compulsory for all groups with consolidated revenues of over € 750 million (in the 2011 proposal, the CCCTB was still optional for all firms), while other companies could choose whether or not to apply it. It was deemed necessary to make the C(C)CTB compulsory for large firms of such a size, because these groups generally have sufficient resources to use tax avoidance strategies. In fact, the consolidation of the tax base eliminates the problem of transfer pricing, while a harmonised tax base prevents any abuse associated with variations in the law between Member States.

The EC proposal on a common tax base supplements the 2011 proposal by including various measures which are also imposed by the ATAD, so as to ensure that the C(C)CTB also conforms to these anti-abuse provisions. It should be noted that the C(C)CTB would impose harmonised rules, while the ATAD aims to provide a minimum level of protection allowing Member States to be stricter if they like. In addition, the new proposal for a common tax base pays particular attention to two deductions: the deduction for research and development (R&D) expenditure and the new deduction for growth and investment.

The proposal makes provision for a particularly large deduction for R&D expenditure, in order to offer maximum support for innovation. The new deduction for growth and investment is meant to end the inequality of tax treatment between debt financing and equity financing of investment. The deduction for growth and investment enables firms, under certain conditions, to also deduct the increase in their equity from their tax base in relation to a given base year<sup>(1)</sup>, so that debt financing no longer gains a tax advantage via the deduction of interest. The C(C)CTB proposal therefore suggests introducing an incremental system for the deduction of notional interest. In that connection, it should be noted that there is also provision for making the reduction in equity subject to tax.

Up to now, no agreement has been reached in the Ecofin Council on either the Directive on a common corporate tax base (CCTB) or on the Directive concerning a common consolidated corporate tax base (CCCTB). At its plenary session on 15 March 2018, the European Parliament, which only needs to be consulted on these Directives, adopted a version of the EC's CCTB and CCCTB proposals which it had amended itself.

## 4. Corporate income tax reform initiatives

In the context of the international developments discussed above, it was desirable for Belgium to implement a corporation tax reform by converting the European Directives on combating tax avoidance and cutting the nominal tax rates in order to remain competitive. The reform, approved by the Belgian Parliament on 22 December 2017<sup>(2)</sup>, is discussed in section 4.1. However, Belgium is not the only country to have adopted reforms. Initiatives in other EU Member States are examined in section 4.2, while the recent major reform of corporate tax in the United States and its potential implications for the EU are analysed in section 4.3.

(1) More specifically, the notional interest deduction is calculated on the basis of the increase in the equity over the previous ten years, or – in the first nine years of implementation of the system – on the basis of the increase in the equity compared to the first year following the introduction of the system. The interest rate is equal to the rate on ten-year government bonds plus a 2 percentage point risk premium.

(2) Law of 25 December 2017 reforming corporate income tax.

## 4.1 Corporation tax reform in Belgium

### *Stimulation measures*

One of the key points of the Belgian corporation tax reform is the rate reduction. The standard rate will be lowered from 33 % to 29 % in 2018 (2019 tax year), and finally cut to 25 % in 2020 (2021 tax year). The complementary crisis contribution will fall from 3 % to 2 % in 2018 (2019 tax year) and will be abolished altogether in 2020 (2021 tax year). For companies whose taxable profit does not exceed € 322 500, the progressive rate of corporation tax will disappear. In future, a reduced rate will apply to companies classed as small under Belgian law. For SMEs, the tax rate will be cut to 20 % on the first € 100 000 of the taxable profit from 2018 onwards (2019 tax year); the complementary crisis contribution will also be reduced before being finally abolished. The part of their taxable profit in excess of € 100 000 will attract the standard rate of corporation tax. This means that, for SMEs, the average tax rate will always be lower than the standard rate.

**TABLE 1** REDUCTION IN NOMINAL TAX RATES  
(in %)

	2018 (2019 tax year)	2020 (2021 tax year)
<b>Normal nominal rate</b>		
Old .....	33	33
New .....	29	25
SME rate (on the first € 100 000) .....	20	20
<b>Complementary crisis contribution (surcharges<sup>(1)</sup>)</b>		
Old .....	3	3
New .....	2	0

Source: FPS Finance.

(1) Before the reform, this led to a combined nominal corporate income tax rate of 33.99%.

A loss-offsetting system is also introduced for related companies so as to make corporation tax in Belgium more competitive. The chosen system will be one in which two companies associated in a group can conclude a mutual agreement whereby the loss recorded by one of them in the current year can be transferred to the other. This system implies that companies belonging to a group are not obliged to draw up a consolidated group tax return. Nonetheless, it is so designed that assets cannot be transferred between two companies in the same group.

The attractiveness of corporation tax in Belgium is also reinforced by increasing the allowance for definitively taxed income (DTI allowance), which will go up from 95 % to 100 %. The existing exemption from payment of payroll tax for researchers is extended to holders of a bachelor's degree.

Finally, various other, less significant, stimulation measures are proposed, such as the provisional reduction to 12.5 % in the rate of the exit tax for real estate investment vehicles, the reduction in the rate of tax on capital gains on closure of a business, standardising it at 15 %, and abolition of the 0.412 % levy on capital gains on shares in companies which are not SMEs.

### *Compensatory measures*

In parallel with the rate reductions and other stimulation measures, a number of compensatory measures are also being adopted to enlarge the tax base so as to ensure that the corporation tax reform is neutral for the budget. In principle, the average tax burden should therefore remain unchanged.

The main compensatory measure is the reform of the notional interest deduction system. In the system applicable up to 2017, the notional interest deduction concerned the total outstanding capital. The reform will seriously restrict this

system as only the increase in equity – what is known as incremental capital – will be taken into account. This system ties in with the EC proposal for introducing an incremental notional interest deduction system based on the increase in the capital over a ten-year period. However, the new system in Belgium is less extensive. For instance, its application is confined to the (average) annual increase in the capital, and the rate of notional interest is lower than proposed by the EC.

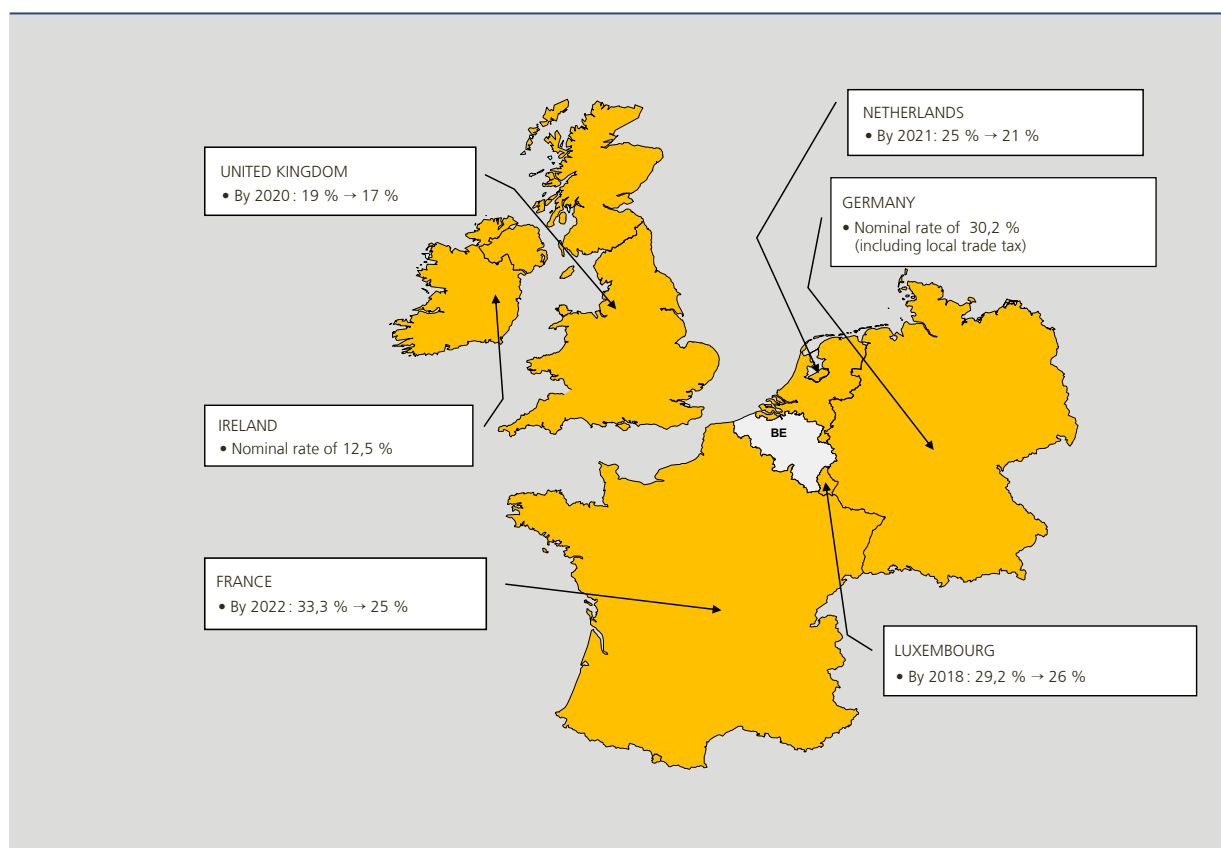
A minimum tax base was also introduced by means of a “basket” containing a number of deductible items, such as definitively taxed income carried forward, innovation income carried forward, past losses, the notional interest deduction carried forward and the new system of incremental notional interest deduction. The maximum allowance for this basket is set at € 1 million, plus 70 % of the tax base remaining after application of the investment allowance. Thus, the minimum corporation tax base is equal to 30 % of the tax base in excess of the sum of € 1 million.

Another key aspect of the reform is the transposition of the European Directives on combating tax avoidance, and in particular the ATAD. Since these Directives aim to limit the erosion of the tax base by tightening up on tax planning, they may help to fund the reform. Among other things, their transposition leads to a restriction on tax deductible borrowings, the taxation of certain income from foreign firms in the controlling domestic firm, and measures intended to combat hybrid mismatches. The exit tax, which was already applied in Belgium, is also being extended. This means that the transfer of assets from a Belgian parent company to a foreign permanent establishment will likewise be subject to this tax in the future.

Other structural measures include harmonising the exemptions for capital gains on shares with the DTI rules, discouraging conversion to a company by increasing the minimum remuneration requirement and penalising failure to respect that condition, making capital reductions taxable, increasing the rate of default interest and late payment interest, abolishing the tax allowances on additional taxes, and disallowing various costs concerning fines and car expenses.

#### 4.2 Corporate income tax reform initiatives in other EU Member States

**CHART 5** CORPORATE INCOME TAX REFORM IN OTHER EU MEMBER STATES





In order to remain competitive and attract foreign investment, various other European countries are similarly contemplating corporate income tax reforms. In addition, as the scope for transferring taxable profits and avoiding corporate income tax is becoming limited at international level, the focus is more on the difference in nominal rates between countries. That is why, among Belgium's neighbouring countries, the Netherlands, France and Luxembourg have all taken steps to cut their tax rates.

In the Netherlands, where the first € 200 000 of the taxable profit is taxed at a lower rate, it was decided – under the government agreement adopted in October 2017 – to lower both the reduced rate and the standard rate. The Dutch government has therefore opted to keep a progressive system but nevertheless plans a reform and tax reduction in stages between now and 2021.

France, too, has a progressive system of corporate taxation whereby the first € 500 000 is taxed at a lower rate. Nonetheless, with effect from the 2020 tax year, this progressive system will be abolished and all profits will be taxed at the lower rate of 28 %. During the following two years, the tax rate will be reduced further to 25 %. In addition to the corporate tax rate payable in France, there is a supplementary 3.3 % levy which will not be abolished.

**TABLE 2** CORPORATE TAX REFORM INITIATIVES IN OTHER EU MEMBER STATES

	Approved?	Characteristics of the current system	Reform timetable
Netherlands	Approved in the Dutch government agreement of October 2017	Progressive system: € 0-200 000: 20 % > € 200 000: 25 %	2019: € 0-200 000: 19 % > € 200 000: 24 % 2020: € 0-200 000: 17.5 % > € 200 000: 22.5 % 2021: € 0-200 000: 16 % > € 200 000: 21 %
France	Approved by the French parliament in December 2017	Progressive system: An earlier reform in 2016 made provision for a reduction to 28 % in 2020. In addition to the rate in force, a supplementary contribution of 3.3 % is levied.	2018: € 0-500 000: 28 % > € 500 000: 33.3 % 2019: > € 500 000: 31 % 2020: Abolition of the progressive system Rate of 28 % 2021: Rate of 26,5 % 2022: Rate of 25 %
Luxembourg	Approved by the Luxembourg parliament in December 2016	Reform already begun in 2017. The rates also include the municipal business tax and the unemployment fund contribution.	2017: 27,1 % 2018: 26 %
United Kingdom	Proposed reform	Reduction from 20 % to 19 % from 1 April 2017 (already decided).	2020: 17 %

Luxembourg, which operates a dual system in which small firms and start-ups are taxed at a lower rate, had already decided in December 2016 to reduce the general rate of corporate tax to 26 % by 2018<sup>(1)</sup>. In addition, it decided to cut the lower rate still further to 22.8 % and extend its application to firms whose taxable profit does not exceed € 30 000.

The United Kingdom has reduced the rate of corporation tax from 20 % to 19 % for tax years from 1 April 2017 onwards; in addition, there is a proposal for lowering that rate to 17 % from 1 April 2020.

Finally, Germany forms an exception to these rate reductions, as there is currently no proposal for revising the rates downwards. Consequently, Germany has a high rate compared to neighbouring countries, namely 30.2 %<sup>(2)</sup>.

### 4.3 Corporate income tax reform in the United States

#### *Main points of the reform*

At the end of 2017, the American Congress approved a radical reform of corporate tax, based on two pillars. First, on 1 January 2018, the nominal tax rate was slashed from 35 % to 21 %<sup>(3)</sup>. Also, the American system of global taxation was replaced by a territorial system so that the tax rate again became a key factor determining the foreign direct investment of American companies. In a worldwide system of taxation, the profits generated by foreign establishments of American multinationals, if repatriated, were in any case subject to American corporate income tax. Nonetheless, it was possible, via a tax credit, to deduct the corporate tax already paid abroad<sup>(4)</sup>. With the switch, to a territorial system, profits are in principle taxed solely in the country where the business is based. However, at the time of this switch, a transitional tax is put in place which helps to finance the reform in the short term: the repatriation of deferred earnings is then subject to a one-off tax at a rate of 15.5 % for cash and liquid assets, and 8 % for non-liquid assets.

In order to stimulate economic growth and encourage business investment, the reform also makes provision for a temporary full deduction of new investment expenditure. This deduction is applicable to the first five years of the reform and attempts to attract innovative activities by creating an appropriate climate for income from intangible assets (see box 3).

Finally, the American reform aims to discourage tax avoidance by multinationals by introducing a minimum tax on businesses established in the United States (Base Erosion Anti-Abuse Tax). This tax is calculated on the taxable profits of the firm before deduction of payments (excluding the sales of goods) to related foreign companies. The aim here is to prevent profit shifting in the form of excessive prices for transactions between related companies. The minimum tax rate was 5 % in 2018, but will rise to 10 % from 2019, and even 12.5 % from the 2026 tax year. However, it should be noted that the tax applies only to firms of a given size, namely those with a turnover of € 500 million or more, whose deduction of payments to related foreign companies exceeds a certain percentage. The inherent risk in this minimum tax is the possibility of double taxation of payments to related foreign companies, because the reform takes no account of the way in which this payment is treated in the country where the related company is based. However, double taxation may be contrary to the bilateral tax treaties concluded by the United States with other countries.

(1) This is the rate, including the unemployment fund contribution and municipal business tax, applicable to firms based in Luxembourg City.

(2) This is the rate of corporate income tax including the special rate of local business tax levied in Berlin.

(3) These are the federal tax rates. Most American states levy additional taxes.

(4) Profits retained by the foreign subsidiary, referred to as retained earnings, were not taxed in the United States until they were repatriated. Consequently, retained earnings were largely kept in the foreign establishments of American companies.

#### Box 3 – The American “carrot and stick” strategy for attracting income from intangible assets

The American corporate tax reform comprises a targeted strategy for attracting income from intangible assets. Two aspects of this reform are crucial here, namely the FDII (Foreign-Derived Intangible Income) rule and the GILTI (Global Intangible Low-Taxed Income) rule.



Under the FDII rule, American companies qualify for a lower tax rate of 13.125 % on the excess return on their foreign sales, including the sale of licences and leases. The excess return is defined as the global return in excess of 10 % of the value of the company's tangible assets. This rule therefore aims to ensure that American firms locate their production for export in the United States and stop that production being transferred to other countries.

Under the GILTI rule, American multinationals with a controlled foreign company deriving substantial income from intangible assets are also taxed on that income in the United States. American corporate tax therefore still includes a worldwide taxation element, namely the tax on the excess return of a foreign company controlled by an American parent. Nonetheless, when this tax is assessed, a tax credit of 80 % of taxes already paid abroad is granted. The minimum tax rate applied after deduction of the tax credit is 10.5 % and applies equally to unrepatriated profits.

However, it should be noted that the "carrot and stick" strategy adopted by the United States to attract innovative activities may not conform to various international agreements. For instance, the BEPS agreements on patent box schemes, whereby the favourable taxation of income from intangible assets is only granted if there is a direct link with the formation of those assets, are certainly not respected. Moreover, the FDII rule could also be considered an unlawful export subsidy.

### *Implications for Europe*

The drastic reduction in the nominal tax rate in the United States will heighten mutual tax competition with Europe, and that will be further intensified by the strategy developed in the United States to attract income from intangible assets. To remain attractive as a location for multinationals, various European countries will consider cutting their rates, encouraging a further race to the bottom.

The switch to a territorial tax regime in the United States will also exacerbate tax competition between European countries. In a system of global taxation, profits repatriated to the United States are taxed at the prevailing American rate. Conversely, in a territorial regime, the European country's rate effectively plays a decisive role in attracting American firms and investment.

Another consequence of the American reform is that tax bases in Europe will come under renewed pressure, because the American system aimed at attracting income from intangible assets will lead to the transfer to the United States of activities hitherto pursued in Europe. The potential uncertainty over the double taxation of income in the context of the minimum tax in the United States may also encourage the transfer of activities from the EU to the United States. The potential erosion of the tax bases is further amplified by the changed incentives concerning profit shifting, because – following the drastic cut in the American rate – it becomes more attractive for firms to transfer their profits to the United States.

Finally, capital flows between the United States and the EU will also be influenced. In particular, the switch to a territorial tax system will boost the repatriation of previously retained earnings, thus expanding the inflow of capital into the United States. This change of regime will also increase American foreign direct investment in Europe, with the tax rate in European countries becoming a key factor here. Foreign direct investment in the United States will increase too, as the tax cut has enhanced profitability. In general, the impact on the net inflow of foreign direct investment depends on the difference between the average effective tax rate in the United States and that in the European country concerned, with a lower effective tax rate leading to a positive net inflow.

## 5. Evaluation and recommendations

### 5.1 Evaluation of European initiatives

The initiatives taken at the instigation of the OECD and with the support of the G20 to combat the erosion of the tax base and tax-motivated profit shifting formed the basis of the ATAD, permitting the coordinated implementation of

action in the EU. The measures aimed at total transparency of tax regimes, e.g. regarding advance tax rulings or prior agreements on transfer pricing, should also curb the transfer of profits to countries where little or no tax is levied. In addition, rules were passed which must be respected by preferential tax regimes applicable to income from patent rights (patent boxes). Consequently, the Belgian regime, which was highly advantageous for firms from an international point of view, was replaced by a deduction for income from innovation with effect from 1 July 2016. The EC considered that advance tax rulings on excess profits (excess profit rulings), which sometimes offered significant tax advantages for multinationals, were against the European rules on state aid. These initiatives, designed to combat tax avoidance, merit support because that practice is both unfair, and inefficient in macroeconomic terms.

Similarly, the EC's intention to establish a common consolidated tax base in the EU, so that profits can be consolidated in multinationals and apportioned according to a formula to the country where the activity takes place, is equally sound. The same applies to its intention to align the tax base with the economic rent, and provide a harmonised incentive for expenditure on research and development. A common corporate tax base in the EU should in any case permit administrative simplification for businesses. An effective approach to tax competition requires not only harmonisation of the tax base but also coordination of the tax rates, e.g. in the form of a minimum rate.

## 5.2 Evaluation of the corporate income tax reform in Belgium

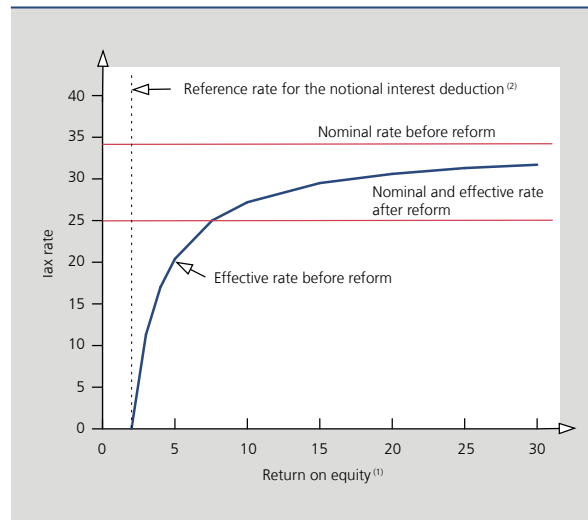
The changing international context, and particularly the international initiatives to combat erosion of the tax base and the downward trend in nominal tax rates, meant that it was necessary to reform corporation tax in Belgium. A key aspect of the Belgian reform is the transposition of the European anti-tax-avoidance Directives. At the same time, it was appropriate to reduce the nominal tax rates, as they were high from a European point of view. Only Malta and France charged higher rates, while the rates were lower in all other EU Member States. Moreover, the downward trend in these rates, which was mainly evident in the run-up to the economic and financial crisis but then more or less came to a halt, seems to have been resumed, as some Member States have recently lowered their corporate tax rate or plan to do so. Cutting the standard nominal rate of corporation tax in Belgium to 25 % will bring the rate more into line with the EU average, which is still slightly lower and arrived at 21.9 % in 2017. If the Belgian rate were to deviate too far from that of other Member States, that might compromise Belgium's attractiveness as a location for multinational undertakings' activities, which could have a detrimental impact. The reform can therefore be expected to produce positive dynamic effects overall, compared to the status quo of the corporation tax regime in Belgium.

The reform of the notional interest deduction is the main measure aimed at offsetting the budgetary impact of lowering the tax rate. The introduction of the notional interest deduction largely eliminated the tax discrimination against equity capital as opposed to borrowings, and improved the solvency of Belgian businesses. Moreover, the notional interest deduction stimulates private investment. That is why international institutions have generally expressed their approval. The EC also recognises the merit of this system, but in its proposal for a common consolidated tax base, it advocates an incremental system for the deduction of notional interest based on the increase in the capital over ten years. This would imply less scope for tax avoidance, and the budgetary impact of introducing this allowance would be relatively small, whereas the economic advantages of the system would be largely maintained. The new Belgian notional interest deduction system, which is more limited than the EC's proposal, will also drastically restrict the scope for abuse. The reform will also reduce the system's economic advantages, one being that the method of funding businesses is not distorted in favour of debt financing rather than equity financing.

The impact of the rate reduction and the reform of the notional interest deduction on the effective tax burden depends on the return on equity. For instance, firms with a low return on their equity which have secured a substantial reduction in their effective tax rate via the notional interest deduction will see their effective tax burden increase. As a result, Belgium will cease to be an attractive location for the financing centres of multinationals. Highly profitable businesses will see their tax burden decrease.

The decision to cut the tax rates and enlarge the tax base is therefore sound, as it is a way of limiting the distortions resulting from corporation tax. The economic dynamism of the reform is reinforced by the measures to encourage investment in research and development and thus to foster innovation. Conversely, the preferential treatment of SMEs via a lower tax rate is contrary to the recommendations of the international institutions, because it could give rise to inefficiencies and conversions to company status. However, a further broadening of the tax base would have been

CHART 6 RETURN ON EQUITY AND EFFECTIVE TAX RATE



Source: NBB.

(1) This is the return on equity before tax.

(2) This is equal to the interest rate on ten-year linear bonds.

possible. By introducing the basket, which limits the amount which can be included for a given year in respect of losses carried forward and other tax-related deductions useful to large firms, the reform goes against the principle of maximising the alignment of the tax base with the economic return and the recommendation in favour of increasing the scope for carrying forward losses, unlike the measure aimed at enabling groups of companies to consolidate their profits between themselves.

## Conclusions

The international context concerning corporate taxation is highly relevant in view of the mobility of capital and profits. In recent years, various measures to combat the erosion of the corporate tax base and tax-motivated profit shifting have been adopted at the instigation of the OECD and with the support of the G20. These anti-tax-avoidance initiatives merit full support.

In addition, some European countries have recently cut their rates or plan to do so. The United States also decided to reduce the tax rate as part of a radical corporate tax reform, and that, too, heightens tax competition within Europe. Thus, the downward trend in corporate tax rates, which had practically stalled after the economic and financial crisis, appears to have resumed.

In this context, the corporation tax regime in Belgium was reformed by the Law of 25 December 2017, by cutting the nominal tax rate and enlarging the tax base. If the rates charged in Belgium differ too much from those in other EU Member States, that could make Belgium much less attractive as a location for the activities of multinationals.

Further European coordination in relation to corporate taxation is desirable. The EC aims to achieve a common consolidated tax base within the EU, but agreements on minimum rates would also be a good idea.

**ANNEX 1** STANDARD CORPORATE TAX RATES<sup>(1)</sup>

(in %)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
Belgium	40.2	40.2	40.2	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	29.6	
Bulgaria	32.5	28.0	23.5	23.5	19.5	15.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Czech Republic	31.0	31.0	31.0	31.0	28.0	26.0	24.0	24.0	21.0	20.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Denmark	32.0	30.0	30.0	30.0	30.0	28.0	28.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	24.5	23.5	22.0	22.0	22.0	22.0	22.0
Germany	51.6	38.3	38.3	39.6	38.3	38.7	38.7	38.7	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2
Iceland	26.0	26.0	26.0	26.0	26.0	24.0	23.0	22.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	20.0	20.0	20.0	20.0	20.0	20.0
Estonia	24.0	20.0	16.0	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
Greece	40.0	37.5	35.0	35.0	35.0	32.0	29.0	25.0	35.0	35.0	24.0	20.0	20.0	26.0	26.0	29.0	29.0	29.0	29.0	29.0	29.0
Spain	35.0	35.0	35.0	35.0	35.0	35.0	32.5	32.5	30.0	30.0	30.0	30.0	30.0	30.0	30.0	28.0	28.0	25.0	25.0	25.0	25.0
France	37.8	36.4	35.4	35.4	35.4	35.0	34.4	34.4	34.4	34.4	34.4	36.1	36.1	38.0	38.0	38.0	34.4	34.4	34.4	34.4	34.4
Croatia	35.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Italy	41.3	40.3	40.3	38.3	37.3	37.3	37.3	37.3	31.4	31.4	31.4	31.4	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	27.8
Cyprus	29.0	28.0	28.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
Latvia	25.0	25.0	22.0	19.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Lithuania	24.0	24.0	15.0	15.0	15.0	15.0	19.0	18.0	15.0	20.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Luxembourg	37.5	37.5	30.4	30.4	30.4	30.4	29.6	29.6	29.6	28.6	28.6	28.8	28.8	29.2	29.2	29.2	29.2	29.2	29.2	27.1	26.0
Hungary	19.6	19.6	19.6	19.6	17.6	17.5	17.5	21.3	21.3	21.3	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	10.8	10.8
Malta	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Netherlands	35.0	35.0	34.5	34.5	34.5	31.5	29.6	25.5	25.5	25.5	25.5	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Austria	34.0	34.0	34.0	34.0	34.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Poland	30.0	28.0	28.0	27.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Portugal	35.2	33.0	33.0	33.0	27.5	27.5	27.5	26.5	26.5	26.5	29.0	29.0	31.5	31.5	31.5	29.5	29.5	29.5	29.5	31.5	31.5
Romania	25.0	25.0	25.0	25.0	25.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Slovenia	25.0	25.0	25.0	25.0	25.0	25.0	23.0	23.0	22.0	21.0	20.0	20.0	18.0	17.0	17.0	17.0	17.0	17.0	17.0	19.0	19.0
Slovakia	29.0	29.0	29.0	29.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	23.0	22.0	22.0	22.0	21.0	21.0	21.0	21.0
Finland	29.0	29.0	29.0	28.0	28.0	28.0	28.0	28.0	28.0	26.3	26.3	26.3	26.3	26.3	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Sweden	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	26.3	26.3	26.3	26.3	26.3	22.0	22.0	22.0	22.0	22.0	22.0	22.0
United Kingdom	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	28.0	28.0	28.0	26.0	24.0	23.0	21.0	20.0	20.0	20.0	20.0	20.0	19.0
Japan	40.9	40.9	40.9	40.9	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5	37.0	37.0	32.1	30.0	30.0	30.0	29.7	29.7
United States	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.2	39.2	39.2	39.1	39.0	39.1	39.0	38.9	38.9	38.9	38.9	25.8
European Union <sup>(2)</sup>	32.0	30.4	29.0	27.8	26.6	25.3	25.1	24.4	23.8	23.8	23.2	23.0	22.9	23.2	22.9	22.8	22.5	21.9	21.9	21.9	21.9
Euro area <sup>(2)</sup>	33.3	32.1	30.4	28.7	27.8	26.7	26.6	25.7	25.1	25.3	24.5	24.4	24.3	25.0	24.7	24.6	24.3	24.1	24.1	24.1	24.1

Source: EC.

(1) The data reflects the highest statutory rate, including any surcharges also on local and/or regional level.

(2) Unweighted average.

## Annex 2 – Overview of the action points in the BEPS project on corporate income tax (OECD/G20) and corresponding actions at European level

In the autumn of 2015, the OECD/G20 BEPS project resulted in a final report in which the OECD and G20 countries agreed on a number of action points and the corresponding recommendations. The table below gives an overview of the 15 action points and recommendations in the OECD/G20 reports and the corresponding actions taken at European level.

OECD/G20 BEPS recommendation	Initiative at European level
1. Address the tax challenges of the digital economy. Certain specific features of the digital economy in fact contribute to BEPS.	The EC launched a programme designed to ensure that the digital economy is taxed in a fair and growth-friendly way. The focus here was not only on corporate tax but also on other taxes such as VAT.  In this connection, in March 2018, the EC launched two draft Directives aimed at the imposition of a fair taxation of the digital economy in the corporate income tax system.
2. Neutralise the effects of hybrid mismatches.	Directive 2017/952 (the ATAD II, which replaces Article 9 of the ATAD) is intended to provide a solution to various situations in which hybrid mismatch abuse is possible, both between Member States and with third countries.
3. Reinforce the controlled foreign company (CFC) rules.	Articles 7 and 8 of the ATAD (Directive 2016/1164) impose a CFC rule on Member States.
4. Limit base erosion by limiting deductions of interest and other financial expenses.	Article 4 of the ATAD (Directive 2016/1164) contains a measure limiting the deduction of interest charges in order to combat erosion of the tax base due to excessive interest payments.
5. Take effective action against harmful tax practices. The BEPS action plan focuses in particular on the automatic exchange of information on tax rulings and the Nexus approach for tax regimes applicable to patents (patent boxes).	<i>Tax rulings</i> : Directive 2015/2376 obliges the Member States to exchange information on tax rulings in cross-border cases and on transfer pricing agreements.  <i>Patent boxes</i> : agreement in the Code of Conduct Group concerning the Nexus approach. Member States must make their patent box systems conform to the BEPS recommendation on the subject.
6. Prevent abuse of tax treaties	EC Recommendation to Member States, as part of the Anti Tax Avoidance Package, whereby they should include a general anti-abuse clause based on the principal purpose test in the tax treaties that they conclude.
7. Prevent artificial avoidance of permanent establishment status. In this regard, the definition of the permanent establishment concept used in the OECD model treaty for the avoidance of double taxation will be adapted.	In the Anti Tax Avoidance Package, the EC recommends aligning the definition of the permanent establishment concept used in tax treaties with the concept in the OECD Model Tax Convention.
8-10. Align transfer pricing outcomes with value creation. For that purpose, the existing rules were clarified and tightened. Action 8 focuses on the transfer pricing of intangible assets, Action 9 concerns the contractual allocation of the risks, and Action 10 covers other factors with a high risk of BEPS in the context of transfer pricing.	The Joint Transfer Pricing Forum is revising and updating the EU's approach to transfer pricing, taking account of the BEPS recommendations.
11. Measuring and monitoring the scale of BEPS.	The EC intends to publish studies on the subject jointly with Eurostat and the Member States. The European Parliament is also conducting research on this subject.
12. Oblige taxpayers to disclose their tax structures. This would permit the early detection of aggressive tax planning.	In May 2018, the Ecofin Council approved Directive 2018/822 which aims to impose new transparency rules on tax advisers and other players (such as banks, lawyers, etc.) who might help to devise tax avoidance strategies.
13. Review transfer pricing documentation: as well as the local file and the group file, country-by-country reporting is also required. The OECD recommendation does not specify any obligation to disclose this information.	Directive 2016/881 makes country-by-country reporting mandatory for multinationals of a certain size. A draft Directive on public country-by-country reporting is currently being considered.
14. Make tax dispute resolution mechanisms more effective: minimum rules were adopted on the prevention and speedy resolution of these disputes.	Directive 2017/1852 on tax dispute resolution mechanisms in the EU lays down specific deadlines for resolving disputes.
15. Devise a multilateral instrument to streamline the implementation of the BEPS rules, particularly in tax treaties.	The Anti Tax Avoidance Package contains an EC Recommendation on how tax treaties can be adapted to combat abuse.

Sources: Explanatory Statement of Actions 2015, Final Reports, OECD/G20 Base Erosion and Profit Shifting Project, and Commission staff working document accompanying the document "Communication from the Commission to the European Parliament and the Council – Anti Tax Avoidance Package: Next steps towards delivering effective taxation and greater tax transparency in the EU".

## Bibliography

Bénassy-Quéré A., N. Goyalraja and A. Trannoy (2007), "Tax and Public Input Competition", *Economic Policy*, 22(50), April, 385-430.

Bettendorf L., M. Devereux, A. van der Horst, S. Loretz, R. de Mooij, B. Jacobs and E. Wasmer (2010), "Corporate tax harmonization in the EU", *Economic Policy*, Vol. 25(63), 537-590, July.

Bucovetsky S. (2009), "An index of capital tax competition", *International Tax and Public Finance*, 16(6), 727-752.

Burggraeve K., Ph. Jeanfils, K. Van Cauter and L. Van Meensel (2008), "Macroeconomic and fiscal impact of the risk capital allowance", NBB, *Economic Review*, September, 7-49.

*Council Conclusions of 8 November 2016 on the criteria for and process leading to the establishment of the EU list of non-cooperative jurisdictions for tax purposes*, Official Journal of the European Union, C 461/2, 10 December.

*Council Conclusions of 5 December 2017 on the EU list of non-cooperative jurisdictions for tax purposes*, Official Journal of the European Union, C438/5, 19 December.

*Council Directive (EU) 2015/2376 of 8 December 2015 amending Directive 2011/16/EU as regards mandatory automatic exchange of information in the field of taxation*, Official Journal of the European Union, L 332/1, 18 December.

*Council Directive (EU) 2016/881 of 25 May 2016 amending Directive 2011/16/EU as regards mandatory automatic exchange of information in the field of taxation*, Official Journal of the European Union, L 146/8, 3 June.

*Council Directive (EU) 2016/1164 of 12 July 2016 laying down rules against tax avoidance practices that directly affect the functioning of the internal market*, Official Journal of the European Union, L 193/1, 19 July.

*Council Directive (EU) 2017/952 of 29 May 2017 amending Directive (EU) 2016/1164 as regards hybrid mismatches with third countries*, Official Journal of the European Union, L 144/1, 7 June.

*Council Directive (EU) 2017/1852 of 10 October 2017 on tax dispute resolution mechanisms in the European Union*, Official Journal of the European Union, L 265/1, 14 October.

*Council Directive (EU) 2018/822 of 25 May 2018 amending Directive 2011/16/EU as regards mandatory automatic exchange of information in the field of taxation in relation to reportable cross-border arrangements*, Official Journal of the European Union, L 139/1, 5 June.

Council of the EU (a), *Tax: EU list of non-cooperative jurisdictions* (<http://www.consilium.europa.eu/fr/policies/eu-list-of-non-cooperative-jurisdictions/>).

Council of the EU (b), *Common consolidated corporate tax base* (<http://www.consilium.europa.eu/fr/policies/ccctb/>).

Council of the EU (c), *Code of Conduct Group on Business Taxation* (<http://www.consilium.europa.eu/fr/council-eu/preparatory-bodies/code-conduct-group/>).

Council of the EU (2014), *Code of Conduct Group (Business Taxation) report to the Council*, 16553/1/14, 11 December.

Council of the EU (2015a), *Council conclusions on business taxation – future of the code of conduct*, press release 908/15, 8 December.



- Council of the EU (2015b), *Council conclusions on corporate taxation – tax base erosion and profit shifting*, press release 910/18, 8 December.
- Council of the EU (2016), *Council conclusions on the code of conduct on business taxation*, Press release 108/16, 8 March.
- Council of the EU (2017a), *Code of Conduct Group (Business Taxation): report to the Council*, 10047/17, 12 June.
- Council of the EU (2017b), *Code of Conduct Group (Business Taxation): report to the Council*, 14784/17, 24 November.
- Council of the EU (2018), *Taxation: 3 jurisdictions removed, 3 added to EU list of non-cooperative jurisdictions*, press release 125/18, 13 March.
- de Mooij R. (2005), "Will corporate income taxation survive?", *De Economist*, 153(3), 277-301.
- de Mooij R. and G. Nicodème (2008), "Corporate Tax Policy and Incorporation in the EU", *International Tax and Public Finance*, 15, 478-498.
- de Mooij R. and M. Devereux (2009), *Alternative Systems of Business Tax in Europe: An applied analysis of ACE and CBIT Reforms*, EC Taxation Papers, Working Paper 28.
- de Mooij R. and S. Hebous (2017), *Curbing Corporate Tax Bias*, IMF, Working paper 17/22.
- de Mooij R., S. Hebous, M. Hrdinkova (2017), *Growth-enhancing corporate tax reform in Belgium*, IMF, Selected Issues Paper, IMF Country report 17/70, 17 March.
- Devereux M. P. (2012), *Issues in the design of taxes on corporate profit*, Oxford University Centre for Business Taxation, April.
- Devereux M. P. and J. Vella (2015), *Are we heading towards a corporate tax system fit for the 21<sup>st</sup> century?*, Oxford University Centre for Business Taxation, Working Paper 14/25.
- Dutch Government (2017), *Vertrouwen in de toekomst*, Regeerakkoord 2017-2021 (<https://www.kabinetsformatie2017.nl/documenten/publicaties/2017/10/10/regeerakkoord-vertrouwen-in-de-toekomst>), Netherlands, 10 October.
- EC (a), *Country by country reporting* ([https://ec.europa.eu/taxation\\_customs/business/tax-cooperation-control/administrative-cooperation/enhanced-administrative-cooperation-field-direct-taxation/country-country-reporting\\_en](https://ec.europa.eu/taxation_customs/business/tax-cooperation-control/administrative-cooperation/enhanced-administrative-cooperation-field-direct-taxation/country-country-reporting_en)).
- EC (b), *State Aid – Tax rulings*, DG Competition ([http://ec.europa.eu/competition/state\\_aid/tax\\_rulings/index\\_en.html](http://ec.europa.eu/competition/state_aid/tax_rulings/index_en.html)).
- EC (2015a), Commission staff working document, *Technical analysis of focus and scope of the legal proposal – accompanying the document "Proposal for a Council Directive amending Directive 2011/16/EU as regards exchange of information in the field of taxation"*, SWD(2015) 60 final, 18 March.
- EC (2015b), *Communication from the Commission to the European Parliament and the Council: A fair and efficient corporate tax system in the European Union: five key areas for action*, COM (2015) 302 final, 17 June.
- EC (2015c), *Corporate income taxation in the European Union, accompanying the document "Communication from the Commission to the European Parliament and the Council on a Fair and Efficient Corporate Tax System in the European Union: 5 Key Areas for Action"*, SWD(2015) 121 final, Brussels, 17 June.

EC (2016a), *DG Competition Working Paper on state aid and tax rulings*, Internal Working Paper, Background to the High Level of Forum on State Aid of 3 June 2016, June.

EC (2016b), *State Aid: Commission concludes Belgian "excess profit" tax scheme illegal; around € 700 million to be recovered from 35 multinational companies*, Press release IP/16/42, 11 January.

EC (2016d), *Communication from the Commission to the European Parliament and the Council – Anti-Tax Avoidance Package: Next steps towards delivering effective taxation and greater tax transparency in the EU*, COM (2016) 23 final, 28 January.

EC (2016d), *Communication from the Commission to the European Parliament and the Council on an external strategy for effective taxation*, COM (2016) 24 final, 28 January.

EC (2016e), *Commission Recommendation on the implementation of measures against tax treaty abuse*, COM(2016) 271 final, 28 January.

EC (2016f), *Commission staff working document accompanying the document "Communication from the Commission to the European Parliament and the Council – Anti Tax Avoidance Package: Next Steps towards delivering effective taxation and greater tax transparency in the EU"*, SWD(2016) 6 final, 28 January.

EC (2016g), *The Anti Tax Avoidance Package – Questions and answers*, 28 January ([http://europa.eu/rapid/press-release\\_MEMO-16-160\\_fr.htm](http://europa.eu/rapid/press-release_MEMO-16-160_fr.htm)).

EC (2016h), *Proposal for a Directive of the European Parliament and of the Council amending Directive 2013/34/EU as regards disclosure of income tax information by certain undertakings and branches*, COM (2016) 198 final, 2016/0107(COD), 12 April.

EC (2016i), *Questions & Answers – Introducing public country-by-country reporting for multinational enterprises* ([http://europa.eu/rapid/press-release\\_MEMO-16-1351\\_en.htm?locale=en](http://europa.eu/rapid/press-release_MEMO-16-1351_en.htm?locale=en)), 12 April.

EC (2016j), *Communication from the Commission to the European Parliament and the Council – Building a fair, competitive and stable corporate tax system for the EU*, COM (2016) 682 final, 25 October.

EC (2016k), *Impact assessment accompanying the document Proposals for a Council Directive on a Common Corporate Tax Base and a Common Consolidated Corporate Tax Base (CCCTB)*, SWD(2016) 341 final, Strasbourg, 25 October.

EC (2016l), *Proposal for a Council Directive on a Common Consolidated Corporate Tax Base (CCCTB)*, COM (2016) 683 final, 2016/0336 (CNS), 25 October.

EC (2016m), *Proposal for a Council Directive on a Common Corporate Tax Base*, COM (2016) 685 final, 2016/0337 (CNS), 25 October.

EC (2017a), *Recommendation for a Council Recommendation on the 2017 National Reform Programme of Belgium and delivering a Council opinion on the 2017 Stability Programme of Belgium*, COM (2017) 501 final, 22 May.

EC (2017b), *The EU list of non-cooperative tax jurisdictions – Questions and Answers*, ([http://europa.eu/rapid/press-release\\_MEMO-17-5122\\_fr.htm](http://europa.eu/rapid/press-release_MEMO-17-5122_fr.htm)), 5 December.

EC (2017c), *Proposal for a Council Directive amending Directive 2011/16/EU as regards mandatory automatic exchange of information in the field of taxation in relation to reportable cross-border arrangements*, COM (2017) 335 final, 2017/0318 (CNS), 21 June.

EC (2018a), *Commission welcomes adoption of far-reaching new transparency rules for tax advisers in the EU*, Press release IP/18/1841, 13 March.

EC (2018b), *Questions and answers on new tax transparency rules for intermediaries* ([http://europa.eu/rapid/press-release\\_MEMO-17-1677\\_fr.htm](http://europa.eu/rapid/press-release_MEMO-17-1677_fr.htm)), updated on 13 March.

EC (2018c), *Communication from the Commission to the European Parliament and the Council – Time to establish a modern, fair and efficient taxation standard for the digital economy*, COM(2018) 146 final, 21 March.

EC (2018d), *Digital Taxation: Commission proposes new measures to ensure that all companies pay fair tax in the EU*, Press release IP/18/2041, 21 March.

EC (2018e), *Proposal for a council Directive laying down the rules relating to the corporate taxation of a significant digital presence*, COM(2018) 147 final, 2018/0072 (CNS), 21 March.

EC (2018f), *Proposal for a Council Directive on the common system of a digital services tax on revenues resulting from the provision of certain digital services*, COM (2018) 148 final, 2018/00073 (CNS), 21 March

EC (2018g), Commission Staff Working document, *Impact assessment accompanying the document proposal for a Council Directive laying down the rules relating to corporate taxation of a significant digital presence and proposal for a Council Directive on the common system of a digital services tax on revenues resulting from the provision of certain digital services*, SWD(2018) 81 final/2, 21 March.

EC (2018h), *Taxation Trends in the European Union – Data for the EU member states, Iceland and Norway*, Edition 2018.

Eugène B., P. Bisciari, M. Nautet, P. Stinglhamber and L. Van Meensel (2013), "Trends in tax systems in the EU", NBB, *Economic Review*, 29-48, December.

European Parliament (2018a), *Legislative train schedule: Common Consolidated Corporate Tax Base (CCCTB) – 2016 proposal* ([http://www.europarl.europa.eu/legislative-train/theme-deeper-and-fairer-internal-market-with-a-strengthened-industrial-base-taxation/file-common-consolidated-corporate-tax-base-\(ccctb\)](http://www.europarl.europa.eu/legislative-train/theme-deeper-and-fairer-internal-market-with-a-strengthened-industrial-base-taxation/file-common-consolidated-corporate-tax-base-(ccctb))).

European Parliament (2018b), *Legislative train schedule: Common Corporate Tax Base (CCTB) – 2016 proposal* ([http://www.europarl.europa.eu/legislative-train/theme-deeper-and-fairer-internal-market-with-a-strengthened-industrial-base-taxation/file-common-corporate-tax-base-\(cctb\)](http://www.europarl.europa.eu/legislative-train/theme-deeper-and-fairer-internal-market-with-a-strengthened-industrial-base-taxation/file-common-corporate-tax-base-(cctb))).

European Parliament (2018c), *Legislative resolution on the proposal for a Council Directive on a Common Consolidated Corporate Tax Base (CCCTB)*, T8-0087/2018, 15 March.

European Parliament (2018d), *legislative resolution of 15 March 2018 on the proposal for a Council Directive on a Common Corporate Tax Base*, T8-0088/2018, 15 March.

Goolsbee A. (2004), "The impact of the Corporate Income Tax: Evidence from State Organizational Form Data", *Journal of Public Economics*, 88, 2283-2299.

HCF (2014), *Tax shifting in favour of labour, and broader tax bases – Scenarios for a significant global tax reform*, "Taxes and parafiscal levies" section, August.

HCF (2016), *Corporation tax in a "post-BEPS" context*, "Taxes and parafiscal levies" section, June.

Hebous S. and M. Ruf (2017), "Evaluating the effects of ACE systems on multinational debt financing and investment", *Journal of Public Economics*, 156, 131-149.

Her Majesty's Treasury (2016), *Budget 2016*, The United Kingdom, 16 March ([https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/508193/HMT\\_Budget\\_2016\\_Web\\_Accessible.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/508193/HMT_Budget_2016_Web_Accessible.pdf)).

IMF (2018), *Fiscal Monitor: Capitalizing on Good Times*, Washington, April.

Jacobs B. (2013), *From optimal tax theory to applied tax policy*, *FinanzArchiv*, 69(3).

Juncker J.-C. (2014), *A New Start for Europe: My agenda for Jobs, Growth, Fairness and Democratic Change*, President Juncker's Political Guidelines, July.

Kari S. (2015), *Corporate tax in an international environment – problems and possible remedies*, VATT Working Papers 62.

Keen M. and K. A. Konrad (2012), *International tax competition and coordination*, Max Planck Institute for Tax Law and Public Finance, Working Paper 2012-06.

*Law of 25 December 2017 reforming corporation tax*, Moniteur belge, Belgium, 29 December.

*Loi du 23 décembre 2016 portant mise en œuvre de la réforme fiscale 2017*, Journal officiel du Grand-Duché de Luxembourg, Grand-Duchy of Luxembourg, 27 December.

*Loi n° 2016-1917 du 29 décembre 2016 de finances pour 2017*, Journal officiel de la République française, n° 0303, France, 30 December.

*Loi n° 2017-1837 du 30 décembre 2017 de finances pour 2018*, Journal officiel de la République française, n° 0305, France, 31 December.

Mankiw N. G., M. Weinzierl and D. Yagan (2009), *Optimal taxation in theory and practice*, NBER, Working Paper 15071.

Mirrlees J., S. Adam, T. Besley, R. Blundell, S. Bond, R. Chote, M. Gammie, P. Johnson, G. Myles and J. Poterba (2011), *Tax by Design: the Mirrlees Review*, Oxford: Oxford University Press.

Myles G. D. (2009a), *Economic growth and the role of taxation – theory*, OECD Economics Department Working Papers, 713.

Myles G. D. (2009b), *Economic Growth and the role of taxation – disaggregate data*, OECD Economics Department Working Papers, 715.

National Bank of Belgium (2017), *Budgetary and macroeconomic aspects of the corporation tax reform in Belgium*, 6 December.

Nicodème G. (2006), *Corporate tax competition and coordination in the European Union: What do we know? Where do we stand?*, *European Economy, Economic Papers* 250.

Nicodème G. (2009), *Corporate income tax and economic distortions*, EC Taxation papers.

Nicodème G. (2017), *Impact assessment accompanying the re-launched CCCTB proposal*, Presentation at BIOF, Brussels, 27 March.

OECD (2015a), *OECD/G20 Base Erosion and Profit Shifting Project: Explanatory Statement*, 2015 Final Reports.

OECD (2015b), *OECD/G20 Base Erosion and Profit Shifting Project: 2015 Final Reports*, Frequently Asked Questions.

OECD (2015c), *Measuring and Monitoring BEPS, Action 11 – 2015 Final Report*, OECD/G20 Base Erosion and Profit Shifting Project, 5 October.

OECD (2017), *Harmful Tax Practices: 2017 Progress Report on Preferential Regimes* (inclusive framework on BEPS: Action 5), OECD/G20 Base Erosion and Profit Shifting Project.

OECD (2018), *Tax challenges Arising from Digitalisation*, OECD/G20 Base Erosion and Profit Shifting Project, 16 March.

Prammer D. (2011), *Quality of taxation and the crisis: tax shifts from a growth perspective*, EC Taxation Papers 29.

Schepens, G. (2016), "Taxes and Bank Capital Structure", *Journal of Financial Economics*, 120, 585-600.

Sørensen P. B. (2010), "The theory of optimal taxation: new developments and policy relevance", Danmarks Nationalbank, *Nationaløkonomisk Tidsskrift*, 148, 212-244.

Spengel C., F. Heinemann, M. Olbert, O. Pfeiffer, T. Schwab and K. Stutzenberger (2017), *Analysis of US Corporate Tax Reform Proposals and their Effects for Europe and Germany*, ZEW Mannheim.

*The EU list of non-cooperative jurisdictions for tax purposes*, Official Journal of the European Union, C 29/2, 26 January 2018.

*The EU list of non-cooperative jurisdictions for tax purposes – Report by the Code of Conduct Group (Business taxation) suggesting the de-listing of certain jurisdictions*, Official Journal of the European Union, C 100/4, 16 March 2018.

*The EU list of non-cooperative jurisdictions for tax purposes – Changes due to commitments received from jurisdictions affected by hurricanes – Adoption*, Official Journal of the European Union, C 100/5, 16 March 2018.

*The EU list of non-cooperative jurisdictions for tax purposes – Report by the Code of Conduct Group (Business taxation) suggesting amendments to the Annexes to the Council conclusions of 5 December 2017, including the de-listing of two jurisdictions*, Official Journal of the European Union, C 191/1, 5 June 2018.

Van Cauter K. and L. Van Meensel (2007), "Recent trends in corporate income tax", NBB, *Economic Review*, juin, 67-83.

Weichenrieder A. J. (2005), *(Why) do we need corporate taxation?*, CESifo Working Paper 1495.

Zangari E. (2014), *Addressing the Debt Bias: A Comparison between the Belgian and the Italian ACE Systems*, EC Taxation Papers, Working Paper 44.

## Conventional signs

%	per cent
e.g.	<i>exempli gratia</i> (for example)
etc.	<i>et cetera</i>
i.e.	<i>id est</i> (that is)
p.m.	<i>pro memoria</i>



# List of abbreviations

## Countries or regions

BE	Belgium
DE	Germany
EE	Estonia
IE	Ireland
EL	Greece
ES	Spain
FR	France
IT	Italy
CY	Cyprus
LT	Lithuania
LV	Latvia
LU	Luxembourg
MT	Malta
NL	Netherlands
AT	Austria
PT	Portugal
SI	Slovenia
SK	Slovakia
FI	Finland
BG	Bulgaria
CZ	Czech Republic
DK	Denmark
HR	Croatia
HU	Hungary
PL	Poland
RO	Romania
SE	Sweden
UK	United Kingdom
EA	Euro area
EU	European Union
EU15	European Union of 15 countries, before the 2004 enlargement
EU28	European Union with Croatia



BR	Brazil
CA	Canada
CN	China
JP	Japan
KR	South Korea
MY	Malaysia
MX	Mexico
RU	Russian Federation
SA	Saudi Arabia
SG	Singapore
TW	Taiwan
US	United States
VN	Vietnam

### Other abbreviations

APP	Asset purchase programme
ATAD	Anti Tax Avoidance Directive
B2C	Business-to-consumer
B&B	Bed and breakfast
BEA	Bureau of Economic Analysis
BEPS	Base erosion and profit shifting
BIS	Bank for International Settlements
BMPE	Broad Macroeconomic Projection Exercise
C2C	Consumer-to-consumer
CCTB	Common corporate tax base
CCCTB	Common consolidated corporate tax base
CEO	Chief Executive Officer
CFC	Controlled foreign company
CPC	Central Product Classification
CPI	Consumer Price Index
CPS	Current Population Survey
CSSP	Committee on Statistics and Statistical Policy
DBI	Definitief belaste inkomsten
DESI	Digital Economy and Society Index
DSGE	Dynamic stochastic general equilibrium
DSR	Debt service ratio
DTI	Definitively taxed income
EBITDA	Earnings before interest, taxes, depreciation, and amortisation
EC	European Commission
ECB	European Central Bank
EEC	European Economic Community
FDII	Foreign-Derived Intangible Income
FeBet	Fédération belge des taxis (Belgian taxi sector federation)
FISIM	Financial intermediation services indirectly measured
FOMC	Federal Open Market Committee
FPS	Federal Public Service
FRED	Federal Reserve Economic Data

FTE	Full-time equivalent
G20	Group of Twenty
GATT	General Agreement on Tariffs and Trade
GDP	Gross domestic product
GILTI	Global Intangible Low-Taxed Income
HICP	Harmonised index of consumer prices
ICT	information and communication technology
IMF	International Monetary Fund
ING	Internationale Nederlanden Groep
ISCO	International Standard Classification of Occupations
ISIC	International Standard Industrial Classification
IT	Information technology
KORUS	Free Trade Agreement between South Korea and the United States
LCR	Liquidity coverage ratio
LFS	Labour force survey
MIR	Monetary financial institution interest rates
NACE	Nomenclature of economic activities in the European Community
NAFTA	North American Free Trade Agreement
NAI	National Accounts Institute
NBB	National Bank of Belgium
P2P	Peer-to-peer
PwC	PricewaterhouseCoopers
OECD	Organisation for Economic Cooperation and Development
OIS	Overnight index swap
OPEC	Organisation of the Petroleum Exporting Countries
R&D	Research and development
RDT	Revenus définitivement taxés
SBTC	Skill-biased technological change
SES	Structure of earnings survey
SME	Small and medium-sized enterprise
TAA	Trade Adjustment Assistance
Tiva	Trade in value added
TLTRO	Targeted longer-term refinancing operation
TPP	Trans-Pacific Partnership
TTIP	Transatlantic Trade and Investment Partnership
UNCTAD	United Nations Conference on Trade and Development
UNECE	United Nations Economic Commission for Europe
USTR	United States Trade Representative
VAT	Value added tax

WTO	World Trade Organisation
ZEW	Zentrum für Europäische Wirtschaftsforschung

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