4. ADDITIONAL AGGRAVATING AND MITIGATING RISK FACTORS

This chapter explores additional aggravating and mitigating risk factors, only partially reflected in the analysis so far, and that are critical to provide an overall assessment of fiscal sustainability risks*. To that end, an analysis of the structure of debt is presented, together with a review of government liabilities beyond (EDP) debt, in particular contingent liabilities. Last, considerations are given to government assets and net debt.*

Recent developments of the structure of government debt are overall favourable across the EU, representing a resilience factor for most countries. *In particular, a general trend of lengthening of the debt maturity is observed. The investor base is also large and diversified in many countries. Recent asset purchases' programmes by the Eurosystem also resulted in a substantial increase of the share of government debt held by Central Banks, representing a stable financing source. However, in many Member States, the share of short-term debt has increased as a result of the COVID-19 crisis, and is non negligible in some countries. Few non-EA countries are also exposed to foreign exchange risk.*

Contingent liabilities' risks remain important in the EU, in particular in the context of the COVID-19 crisis. *As a response to the crisis, many governments granted substantial support to the private sector in the form of guarantees. However, the surge in such government guarantees remained moderate in most cases, and overall lower than during the Global Financial Crisis. They are expected to ease up in 2022 according to Member States' Draft Budgetary Plans. A snapshot analysis of banking balance sheets points to contained vulnerabilities, though the impact of the COVID-19 pandemic on credit quality as well as other indicators continues to be difficult to be precisely assessed. Simulations, based on the Commission Symbol model, which try to overcome such data limitations, highlight that (implicit) contingent liabilities' risks linked to the banking sector are present in some countries, in particular under a stressed scenario.*

The holding of (large) financial assets in some countries constitutes a mitigating factor to fiscal risks. *At the same time, country rankings for indebtedness are similar when comparing gross and net debt ratios, and both indicators increased in the majority of countries over the past decade, notably reflecting the GFC and the COVID-19 crises.*

Additional aggravating and mitigating risk factors are taken into account – as a complement to the quantitative results of the framework – in order to ensure a balanced overall assessment of fiscal sustainability challenges. The previous chapters presented quantitative results on the basis of the DSA risk assessment, as well as fiscal sustainability indicators. Yet, these quantitative results need to be interpreted against additional aggravating and / or mitigating risk factors that are only partially factored-in in the quantitative results of the framework. Such factors are particularly relevant at the current juncture of still important uncertainty.

A number of key aggravating and mitigating risk factors are analysed in this chapter. Section 4.1 provides an analysis of the debt structure, notably in terms of maturity, currency denomination and holders, which gives an important indication of potential vulnerabilities (or strengths). Section 4.2 examines implicit and contingent liabilities, notably linked to the government guarantees granted as a response to the COVID-19 crisis, and those that could arise from the banking sector, including on the basis of the Commission Symbol model. Section 4.3 discuses other relevant factors, including government assets. The additional risk factors considered in this chapter are treated horizontally in the overall assessment, insofar the identified vulnerabilities or supporting factors may materialize in the short, medium or long term. ([61])

([61]) Some other factors are not examined in this chapter. This concerns in particular the quality of institutions. As shown by a rich literature, the quality of institutions is an important supporting factor of public debt sustainability. In the EU, a deeply integrated region of mainly advanced economies, evidence suggests that the quality of

4.1. RISKS RELATED TO THE GOVERNMENT DEBT STRUCTURE

The structure of government debt can play an important role in ensuring sustainable public finances in different ways. First, by determining the level and response of interest payments to changes in economic and financial conditions. Then, by influencing the degree of risks, notably refinancing and rollover risks. According to IMF (2014), an optimal government debt portfolio should minimise interest payments subject to a prudent degree of refinancing and rollover risks (cost – risk trade-off).

The debt composition needs to be analysed along several dimensions. In this section, the analysis focuses on three aspects: the maturity structure, the currency denomination composition and the nature of the investors' base. ([62]) With this aim, three main variables of debt structure are used: i) the share of short-term debt in total government debt (at original maturity); ii) the share of debt denominated in foreign currency in total government debt, and iii) the share of debt held by non-residents in total government debt.

A risk-based approach is used to capture additional vulnerabilities or mitigating capacity, stemming from the composition of government debt. The values of the three main selected variables are analysed against critical thresholds of fiscal risk obtained through the signalling approach - the same as in the computation of S0. ([63])The results are reported for all countries in the form of a joint heat map (see Table I.4.1) and separately for each country in the statistical fiches in the volume 2 of the FSR. ([64])

Table I.4.1: **Risks related to the government debt structure, by country (2020)**

	Short-term public debt (original maturity)	Public debt in foreign currency	Public debt held by non-residents
	Shares of total debt (%):		
BE	**8.0**	0.0	**55.9**
BG	0.1	**82.5**	48.8
CZ	1.7	8.6	32.7
DK	**21.6**	8.4	33.0
DE	**11.8**	4.3	45.4
EE	**9.3**	0.0	**70.0**
IE	**10.1**	0.0	**55.5**
EL	5.8	1.2	**82.6**
ES	**7.5**	0.0	43.9
FR	**12.8**	4.3	48.6
HR	6.0	**71.0**	32.1
IT	**14.2**	0.1	29.8
CY	**6.6**	0.0	**81.9**
LV	3.0	0.0	**66.8**
LT	0.0	0.0	**69.5**
LU	2.6	0.0	**50.0**
HU	**8.2**	22.0	33.2
MT	**10.2**	0.0	18.2
NL	**14.7**	0.0	37.8
AT	**8.9**	0.4	**63.7**
PL	1.8	23.4	34.5
PT	**16.7**	0.0	49.0
RO	3.5	**52.3**	50.9
SI	2.5	0.1	**58.9**
SK	3.5	0.0	**53.6**
FI	**15.6**	2.7	**60.8**
SE	**29.9**	17.9	20.0

(1) Upper and lower thresholds: (i) Share of short-term government debt: upper threshold 6.57%; lower threshold 5.3%; (ii) Share of government debt in foreign currency: upper threshold 31.58%; lower threshold 25%; (iii) Share of government debt held by non-residents: upper threshold 49.01%; lower threshold 40%. Spread on 10-year; government bonds vs. Germany – 2019 last value - upper threshold 231; lower threshold 185 (see also Annex A1).
(2) Share of short-term debt: based on partially missing information for Netherlands.
(3) Foreign-held debt figures are shown against a double shading that blends the colour coding of volatility risks from non-resident tenure (left side of the shaded cells) with that of sovereign risk given by the average spread on 10-year government bonds vs. Germany (right side of the shaded cells).
Source: Eurostat, ECB.

The share of short-term government debt has increased in 2000, though the average maturity of government debt remains high. With a high share of short-term debt, a government may be vulnerable to increases in monetary policy rate, and to rapid changes in financial markets' perceptions. From this angle, fiscal risks exist for several EU countries (see Table I.4.1). The share of short-term debt is particularly high in Sweden (close to 30% of total government debt), with the

institutions would be on average higher and less heterogeneous than in other parts of the world (for a literature review, see Box 1.2 of the FSR 2018).

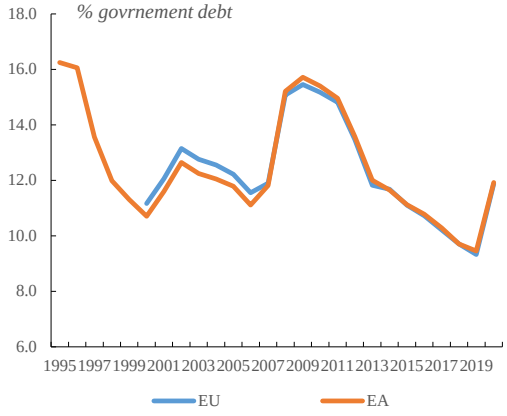
([62]) Other dimensions could also be considered such as the type of interest rates (fixed / variable), and relatedly the presence of indexation mechanisms (e.g. inflation-linked bonds), or state-contingent features, as well the nature of debt instruments (the latter is analysed to some extent in section 4.2 of this chapter).

([63]) For details on the signals approach see Chapter 1. This methodology shows that, based on historical events, the three variables appear to be relatively good leading indicators of fiscal stress.

([64]) Fiscal risk levels are determined accordingly: i) high risk (red), if the values are at or above the threshold of fiscal risk from the signals' approach; ii) medium risk (yellow), if the values are below the threshold obtained from the signals' approach, but at or above a benchmark of around 80% of the same threshold; iii) low risk (green) otherwise.

short-term debt ratio also exceeding 10% in Denmark, Portugal, Finland, Netherlands, Italy, France, Germany, Malta and Ireland. Moreover, this ratio increased in most countries in 2020, and for the EU/EA as a whole (see Graph I.4.1), as a result of the COVID-19 crisis and the need to finance large financing needs. ([65])

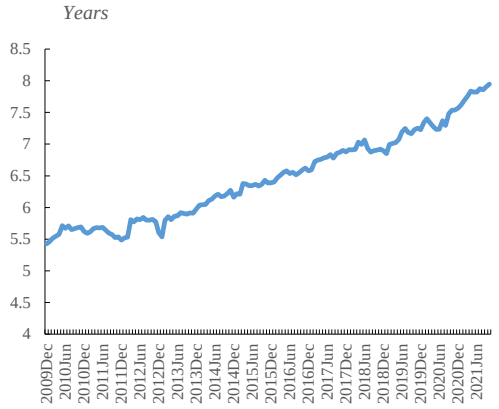
Graph I.4.1: **Share of short-term debt (% of total general government debt)**



(1) Short-term debt includes currency and deposit, short-term debt securities and short-term loans.
Source: Eurostat.

Yet, these results need to be further qualified, notably given the trend increase of the overall average maturity of government debt. The average (residual) maturity of government debt (securities) has increased over time (see Graph I.4.2), and reached a record high in 2021 (at close to 8 years on average) since 2009 (around 5½ years). This increasing trend is observed for most countries, and the maturity was particularly long in 2021 in Greece, Austria, Belgium, Ireland, Slovenia and Lithuania (see Table I.4.2). Moreover, the weight of short-term debt *as a share of GDP* is worth considering in parallel (e.g. for Sweden, given the low level as a share of GDP, this ratio is limited) ([66]). In the case of external short-term debt of non-euro area countries, the level of a country's international reserves equally deserves consideration. ([67]) Last, Treasury cash-flow management has an influence both on the headline short-term debt and the availability of other liquid financial assets, such as cash deposits, which could mitigate potential stress (see also section 4.3).

Graph I.4.2: **Average (residual) maturity of government debt (securities), simple average over EU countries**



(1) Data are missing for Estonia.
Source: ECB (Debt securities issuance and service by EU governments, October 2021).

Table I.4.2: **Average (residual) maturity of debt, general government, by EU country**

	Debt securities				All debt
	2009Dec	2020Dec	2021Oct	Increase 2021/09	2020
BE	5.5	10.4	10.9	5.4	10.4
BG	4.3	8.4	7.7	3.4	8.8
CZ	6.2	5.9	6.4	0.2	:
DK	8.1	7.3	7.9	-0.2	:
DE	5.5	6.7	7.4	1.9	7.3
EE	:	:	:	:	8.4
IE	6.3	10.9	10.7	4.5	9.1
EL	7.9	9.2	9.5	1.6	22.5
ES	6.5	7.8	7.9	1.4	7.5
FR	6.4	7.9	8.3	1.9	8.4
HR	:	5.4	5.7	:	5.1
IT	7.3	7.0	7.1	-0.3	7.4
CY	3.1	7.9	7.7	4.6	8.0
LV	3.7	8.8	9.2	5.5	8.1
LT	:	9.0	9.6	:	9.0
LU	3.9	6.3	6.2	2.2	:
HU	4.1	5.6	6.6	2.6	5.1
MT	5.3	7.7	8.6	3.3	8.7
NL	5.2	7.2	8.3	3.2	:
AT	7.3	10.9	11.5	4.2	:
PL	5.3	4.4	4.4	-0.8	:
PT	6.1	6.5	7.0	0.9	6.6
RO	2.3	7.4	7.6	5.3	7.7
SI	5.9	8.8	9.7	3.7	9.0
SK	4.5	8.3	8.7	4.3	:
FI	4.1	6.5	7.2	3.1	:
SE	5.4	4.4	4.8	-0.6	:
Average (simple)	**5.4**	**7.6**	**7.9**	**2.5**	**:**

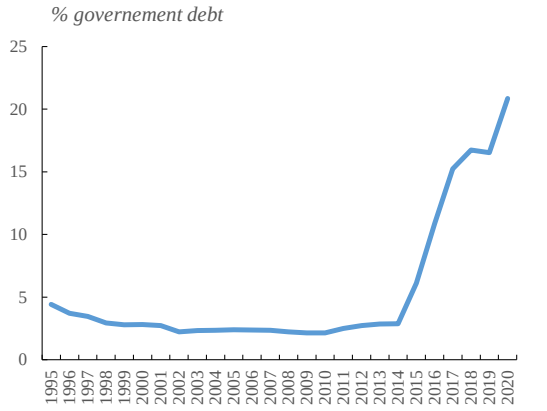
Source: ECB (Debt securities), Eurostat (all debt), national sources (all debt for EL and CY).

([65]) If the structure of debt tends to be fairly stable over time, in the wake of major crises or large scale financial innovation, changes in the debt composition can be large and sudden (see Abbas et al., 2014 and Box 3.4 of the 2018 FSR).
([66]) See S0 indicator table on fiscal variables.
([67]) The size of a country's international reserves compared with its short-term external debt shows whether it has enough resources to counter a sudden stop in capital flows and its capacity to service its short-term external debt.

The share of debt denominated in foreign currency is limited, except in few non-EA countries. As advanced economies finance themselves overwhelmingly in their own currency, currency-related fiscal risks are largely absent for the EU countries that have adopted the euro (see Table I.4.1). ([68]) Yet, foreign currency-denominated debt is large in some Central and Eastern European countries (CEEC). This is the case of Bulgaria, Croatia and Romania (with a share well above 50% of total debt), ([69]) as well as to a lesser extent Poland, Hungary and Sweden. For all these countries, hedging of foreign currency positions can mitigate potential exchange rate risks, ([70]) whereas pegs or currency boards also significantly reduce exposure to fiscal risks from the share of public debt in foreign currency. ([71]) Moreover, in these countries, the major share of foreign currency issuances are denominated in euro, and in some countries, governments have succeeded in reducing their reliance on foreign currency borrowing, e.g. in Czech Republic, Hungary, Poland and Romania (Eller and Holler, 2018).

EU countries' investor base is solid, though in some cases, the substantial share of debt held by non-residents creates vulnerabilities. ([72]) Several euro-area countries are found to have large shares of foreign held government debt, including Greece, Cyprus, the Baltic countries, Austria, Finland, Slovenia, Belgium, Ireland, Slovakia and Romania (all beyond 50% of total government debt; see Table I.4.1). However, in some cases, this high share reflects important official lending associated to past financial assistance programmes (Greece, Cyprus, Ireland and Portugal; see Graph I.4.4). In others, the large foreign investor base underlines the country's worthiness, as shown by limited sovereign bond spreads (e.g. Austria, Finland and Belgium). ([73]) In general, it may also be beneficial for financial and macroeconomic stability as a higher share of foreign investors reduces the risks of adverse loops between the sovereign and the national banking systems (Bouabdallah et al., 2017). For some other non-euro area countries such as Romania, Poland and Hungary, the significant share of foreign held debt could be more associated with a search for yield given a more emerging markets status and relatively small local-currency markets.

Graph I.4.4: **Share of government debt held by (domestic) central banks, EA aggregate**



(1) Based on Maastricht debt (at face value).
Source: ECB.

A detailed overview of government debt allocation by different holders indicates that an increasing share of government debt is held by domestic central banks (and the ECB for EA countries). By end 2020, in about half EU countries, at least one fifth of government debt was held by domestic Central Banks (see Graph I.4.4). Largest share are observed in Slovenia, Slovakia, Ireland and the Netherlands (close to 30%). For high debt countries, this share varies from less than 10% (Greece) to more than 25% (Spain).

([68]) A domestic currency denomination traditionally protects governments against currency mismatches between a government's interest expenditure and tax revenue. Yet, in some countries, the rationale behind foreign-currency-denominated debt issuance is to attract foreign investors, not willing to bear the foreign currency risk. Ultimately, this may reduce funding costs for these governments (all else being equal) by reducing liquidity premia (Eller and Holler, 2018).

([69]) Bulgaria has a currency board since 1997 and nearly all of its foreign currency debt is issued in euro. While the peg is maintained, shocks to debt in foreign currency are virtually zero. Croatia has tightly managed arrangements, also limiting exchange rate fluctuations.

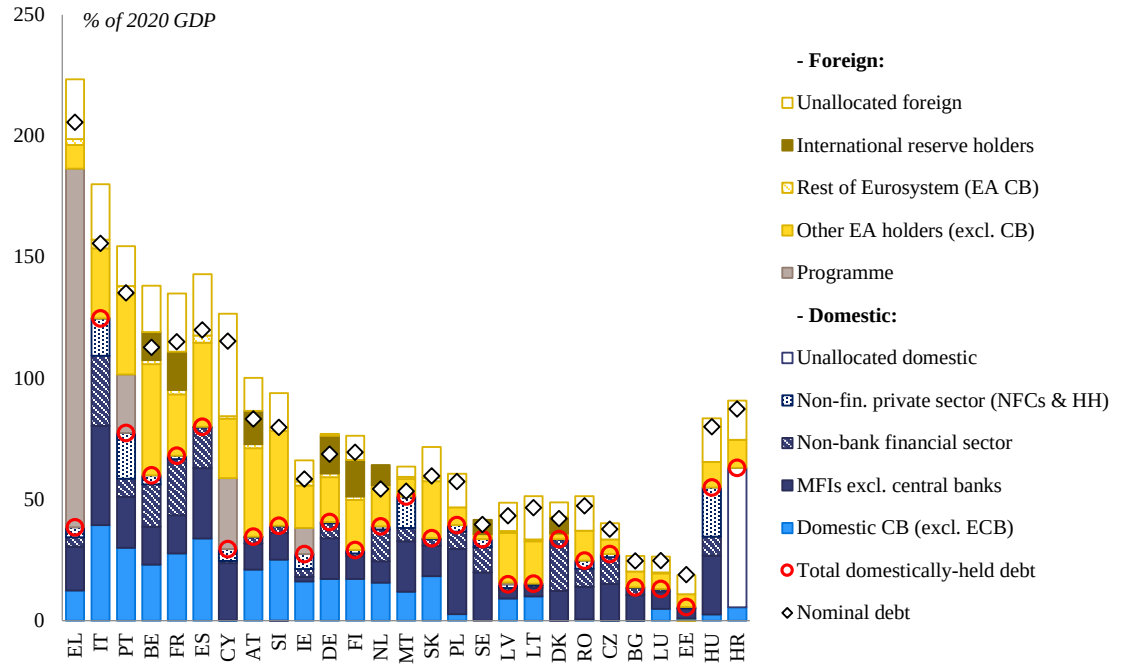
([70]) Hedging operations are not taken into account in the FSR.

([71]) On the idiosyncrasies of different exchange rate regimes and the extent to which exchange rate shocks could impact the public debt-to-GDP ratios see European Commission (2017) - Chapter 2, Box 2.2.

([72]) Indeed, the foreign investor base tends to be more volatile and prone to sudden stops in situations of heightened uncertainty.

([73]) In Table I.4.1, foreign-held debt figures are shown against a double shading that blends the colour coding of volatility risks from non-resident tenure (left side of the shaded cells) with that of sovereign risk given by the average spread on 10-year government bonds vs. Germany (right side of the shaded cells).

Graph I.4.3: **Holders of government debt, 2020-Q4, market value (% of GDP)**



(1) Debt refers to consolidated general government debt at market value, which for some countries differs from debt at nominal value (EDP debt) used in the rest of the report and represented here by white diamonds. For more details, see https://www.bis.org/publ/qtrpdf/r_qt1509g.htm and https://www.bis.org/statistics/totcredit/credgov_doc.pdf. (2) Only data for total MFIs (Monetary Financial Institutions) are reported. The split between commercial banks and central banks is an estimate based on annual nominal data. The category 'International reserve holders' represents holdings by international organisations and non-EA central banks as reserve assets. The category '(Rest of) Eurosystem' includes holdings by the ECB. The category 'Non-financial private sector' represents holdings by non -financial corporations (NFCs) and households (HH).
Source: Commission services based on ECB, Eurostat, IMF.

Moreover, at the EA aggregate, the share of debt held by (domestic) Central Banks has significantly increased since 2014 (when this share amounted to less than 3%; see Graph I.4.3), notably reflecting asset purchases' programmes (see also chapter 1).

For almost all EA countries, the signal of investor confidence (illustrated in Table I.4.1**) emerges also from the detailed overview of government debt allocation by different holders** (see Graph I.4.4). For medium size and larger EA economies, comparatively more significant shares of government debt are currently in the hands of non-EA central banks in the form of reserve assets (including Germany, France, the Netherlands, Finland, Austria, and Belgium). For smaller EA economies (e.g. Latvia, Lithuania, Slovenia and Slovakia), the *rest of the EA* financial sector has become a more important holder of government debt than these issuers' domestic financial sectors, suggesting that home bias here is disappearing or transforming as the EA grows more integrated financially and financial institutions follow harmonised prudential rules under the Single Rulebook.

While evidence of domestic versus foreign debt holdings is mixed, the latter is more likely to entail risks when the foreign tenure is not particularly safe or confidence-driven. In some countries, such as Malta, Sweden and Italy, a high share of government debt is domestically held. Conversely, in a few cases relatively larger shares of government debt held by foreign and / or unidentified investors outside the euro area that are not reserve asset holders ('unallocated') may reflect risks usually associated to this uncertain, potentially more volatile basis (e.g. Romania, Cyprus and Slovakia).

The analysis of risks arising from the debt profile needs not be confined to these indicators and the associated benchmarks. Other factors, some of which mentioned above, such as the exchange rate regime, the role of the central bank in mitigating short-term liquidity needs, the

capacity of the market to absorb debt, influence as well the results of the analysis. The underlying reasons for debt profile vulnerabilities, such as contagion, incomplete credit markets, weak debt management practices, may also be important in this regard.

4.2. LOOKING BEYOND 'GOVERNMENT DEBT': RISKS RELATED TO GOVERNMENT OTHER DIRECT AND CONTINGENT LIABILITIES

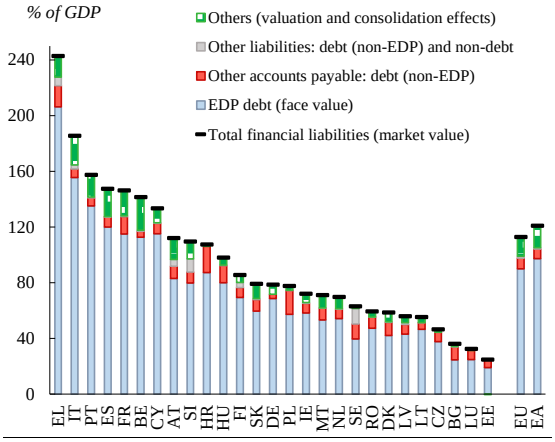
This section provides an analysis of the size and, when possible, the evolution of government liabilities other than 'EDP (or Maastricht) debt' in the EU. Such a complementary analysis allows identifying additional risk factors compared to the results of the standard debt sustainability analysis provided in this report (see chapter 2). The section looks in particular into government direct liabilities that are not included in the EDP debt (sub-section 4.2.1), while sub-sections 4.2.2 to 4.2.3 discuss risks linked to contingent liabilities. The latter are particularly important in the context of the COVID-19 crisis, including as vulnerabilities could eventually materialise in the banking sector.

4.2.1. EDP debt, other debt and non-debt financial instruments: a snapshot overview

The EDP debt liabilities were the main component of on-balance government gross liabilities in 2020 in all Member States. In the EU as a whole, the EDP debt was around 90% of GDP and accounted for more than three-quarters of total gross financial liabilities in 2020 (see Graph I.4.5). In terms of instrument coverage, debt securities, commonly in the form of bills, commercial papers and bonds, account for more than two-thirds of the government gross debt in most Member States. Contributions of loans, coins when issued by governments and deposits held by entities classified inside general government tend to be less significant across Member States. ([74])

The difference between total gross liabilities and the EDP debt varies widely across Member States. In 2020, the portion of total gross government liabilities (at market value) not reflected in the EDP debt (measured at face value) ranged from 37% to 30% of GDP in Greece, France, Italy and Slovenia, and below 10% of GDP in Estonia, Luxembourg, Czechia and Lithuania. This difference consists of other debt instruments (so-called non-EDP debt), non-debt financial instruments and a gap due to different valuation and consolidation methods applied to financial liabilities. ([75])

Graph I.4.5: **Debt and non-debt financial liabilities in EU Member States in 2020**



Source: Commission services based on Eurostat.

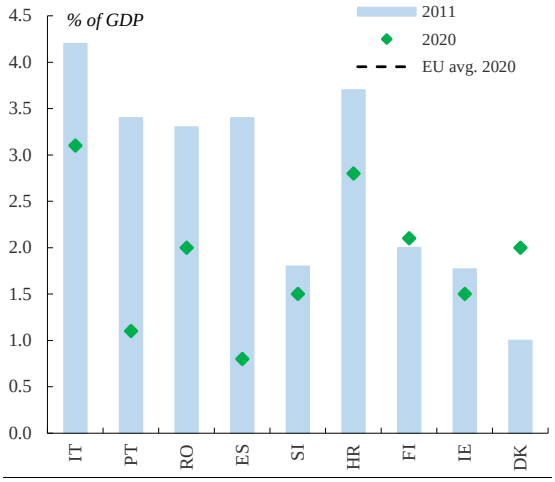
Among non-EDP debt liabilities, "other accounts payable" is the most significant component. Other accounts payable include trade credits and advances. These are in most cases outstanding short-term liabilities of the government from transactions of goods and services, and to a lesser extent other timing differences in settling obligations. During periods of financial distress, this debt instrument can become an important government financing alternative. For instance, in few Member States, such as Italy, Portugal, Romania, Spain and Slovenia, government trade debt tended to be higher during the Global Financial Crisis. Over time, stocks of trade credits and advances have receded in these Member States, while increasing

([74]) The share of loans can nevertheless be significant in some Member States, in particular in those that have benefited over the past years from financial assistance in the form of official loans.

([75]) The valuations of the EDP debt and ESA 2010 balance sheets are different. In particular, total gross EDP debt of the general government is valued at face value, while in ESA 2010, government gross liabilities are valued at market prices.

in others (e.g. Belgium and Denmark). In 2020, as a share of GDP, these liabilities were highest in Italy, (3.1%), Croatia (2.8%), Finland (2.1%), Denmark (2%) and Romania (2%), compared to an EU average of 1.6% of GDP (see Graph I.4.6). ([76])

Graph I.4.6: **Trade credits and advances in selected Member States in 2011 and 2020**



Source: Eurostat.

Other liabilities (debt and non-debt financial instruments) are typically a narrow set of total government liabilities. In 2020, these other liabilities were more relevant for Sweden (11% of GDP – of which mainly insurance, pensions and standardised guarantees), Slovenia (9.3% of GDP – of which mainly financial derivatives and employee stock options), Greece (6.1% of GDP – of which mainly financial derivatives and employee stock options), Austria, Finland, Italy and Latvia, while accounting for less than 1% of GDP in other Member States.

The gap reflecting valuation and consolidation effects can be relatively large in some Member States. Ranging from 23% to about 1% of GDP in 2020, this gap was highest in particular in Belgium, Italy, Spain, and France. In most cases, the magnitude of this gap is affected largely by the impact of different valuation bases for the EDP debt (face value) and gross financial liabilities (market value) and to a lesser extent by the impact of the consolidation method (EDP debt is consolidated both within and between the subsectors of the general government, gross financial liabilities only within subsectors). The consolidation effects are in fact small in most Member States. ([77])

([76]) Eurostat (2015) and Eurostat (2021a).

4.2.2. (Explicit) contingent liabilities in the EU

As part of the analysis of contingent liabilities proposed in this report, this section contains an overview of *explicit* contingent liabilities, as reported by Eurostat. These explicit contingent liabilities comprise government guarantees, including those related to government interventions in the financial sector, and liabilities related to off-balance PPPs (public - private partnerships). ([78])

Government guarantees and PPPs prior to the COVID-19 crisis

Government guarantees represent a source of potential fiscal cost in several Member States, in case they are called. ([79]) Before the COVID-19 crisis, in 2019, the highest stock of outstanding government guarantees was recorded in Finland (more than 33% of GDP), Denmark (more than 18% of GDP) and Austria (about 6% of GDP) (see Graph I.4.8). In *Finland*, a sizeable part of the guarantees were related to export guarantees, student loans and funds for supporting housing production, and have been overall increasing since 2010 (see Graph I.4.7). In *Denmark*, most guarantees concerned social housing and state-owned enterprises such as the Danish Railways, the national broadcaster DR and the Oresund, Storebaelt and Fehmarn connections. In *Austria*, guarantees were largely provided to nonfinancial private entities for export promotion, to public and private financial institutions during the crisis, and to non-financial public corporations such as road

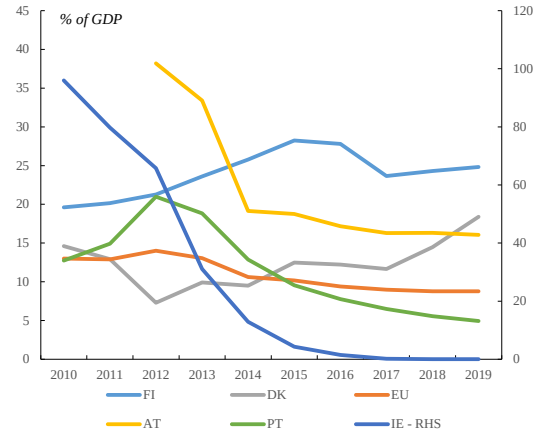
([77]) Eurostat (2021b).

([78]) This information can also be found in the statistical country fiches (see volume 2 of the FSR). Note that some of this information may be overlapping, e.g. guarantees issued in the context of government interventions in the financial sector form a subset of total government guarantees. For this reason, evaluating the total risk by summing up the indicators could overestimate the potential impact.

([79]) Government guarantees are typically designed to reimburse a lender in case of possible losses linked to the loans it has provided. Government guarantees are issued to promote economic stability or pursue other public policy objectives, with the examples of guarantees on student loans or guarantees on the losses incurred by exporters in case of non-payment by a trading partner.

and rail infrastructure companies ([80]). In the EU as a whole, public guarantees declined from around 13% of GDP in 2010 to 9% of GDP in 2019. This largely reflects a decline in the use of government guarantee schemes for financial institutions granted in the context of the financial crisis in number of EU Member States.

Graph I.4.7: **Developments in government guarantees in selected EU Member States, 2010-2019**

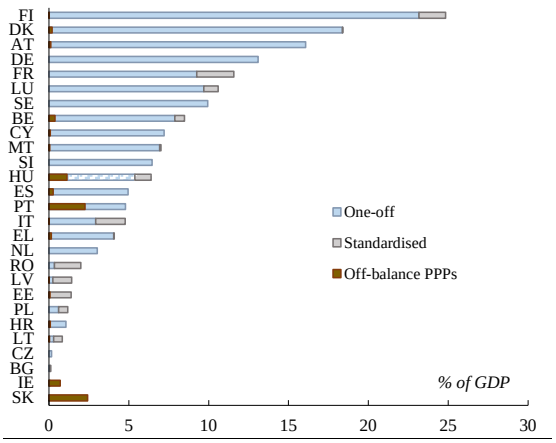


Source: Eurostat.

In most Member States, the largest category of government guarantees relates to one-off guarantees granted under individual contractual arrangements, usually involving more sizeable amounts. In 2019, the stock of *one-off guarantees* ranged from close to 32% of GDP in Finland and 16% of GDP in Austria to less than 0.5% of GDP in Romania, Lithuania, Latvia, Czechia, Bulgaria, Slovakia, Estonia and Ireland (see Graph I.4.8). On the other hand, the total amount committed in *standardised guarantee schemes* (issued in large numbers for small amounts) carries a more modest risk for future public expenditure in most Member States. These schemes account for more than 1% of GDP only in Denmark (7% of GDP), France (2.3%), Italy (1.9%), Romania (1.7%), Finland (1.7%), Estonia (1.4%) and Latvia (1.2%). ([81])

Contingent liabilities linked to off-balance public private partnerships (PPPs) are a modest source of risk for most Member States. The use of public private partnerships (PPPs) for economic and social infrastructure projects, such as for the development of transport infrastructures and hospitals, can generate additional liabilities for the government. Depending on the distribution of risks and rewards between private and public partner, assets and liabilities related to PPPs can be recorded either on government's balance sheet or on the private partner's balance sheet. The first ones (on-balance PPPs) affect government's debt directly. However, also for those PPPs where the private partner is exposed to the majority of risks and rewards, and which are therefore recorded off government's balance sheet, government may be contractually obliged to step in under certain circumstances (for example, failure of the private partner). For the EU as a whole, contingent liabilities related to off-balance PPPs have modestly accounted for no more than 0.2% of GDP since 2010 and are only affecting few Member States (see Graph I.4.8). In 2019, more sizeable contingent liabilities related to off-balance PPPs were recorded in Slovakia (2.4% of GDP), Portugal (2.3% of GDP) and Hungary (1.1% of GDP).

Graph I.4.8: **Government guarantees and off-balance PPPs in EU Member States in 2019**



Source: Eurostat.

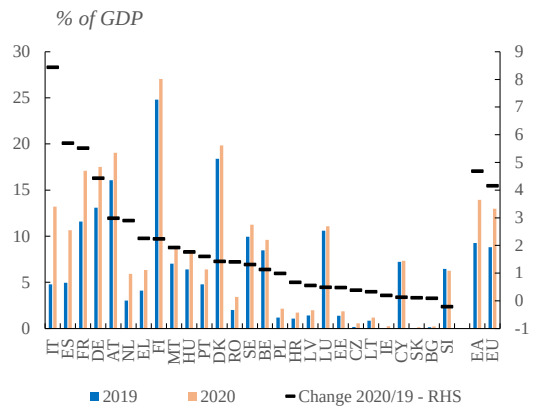
([80]) See IMF (2018).

([81]) In some cases, governments issued *standardised* guarantees in response to the COVID-19 crisis; for such guarantees, expected losses are recorded as estimated deficit impact upfront, in line with ESA 2010 rules. While high uncertainty remains, this mitigates the potential impact of the guarantees for future deficits. This was particularly the case for Italy, where the stock of guarantees increased most in 2020: as the guarantees issued in 2020 in response to the COVID-19 crisis were predominantly standardised, losses associated with the expected future guarantee calls (0.7% of GDP) were already reflected in the deficit of 2020.

Government guarantees granted in the context of the COVID-19 crisis

As a response to the COVID-19 crisis, Member States also provided significant liquidity support to households and businesses in the form of guarantees. During the COVID-19 crisis, the total stock of government guarantees for the EU as a whole increased from about 9% of GDP in 2019 to about 13% of GDP in 2020. However, large differences appear across Member States, with the highest increase recorded in Italy (about 8 pps. of GDP), Spain (less than 6 pps. of GDP), France (5½ pps. of GDP) and Germany (more than 4 pps. of GDP), while the stock of guarantees was broadly stable in 2020 in half of the Member States (with a rise by less than 1 pp. of GDP; see Graph I.4.9). In the case of Italy and Spain, the pre-crisis level was moderate at less than 5% of GDP. Hence, the surge in government guarantees remained moderate in most cases, and overall lower than during the Global Financial Crisis. Contingent liabilities arising from the provision of government guarantees to sustain economic activity and sectors particularly hit by the pandemic would in general be reflected in public debt and deficits *only if called*, except in case of standardised guarantees. It is also worth noting that the mere amount of the guarantees that have been taken up does not correlate with their probability to be called, since this is driven by other aspects, in particular the solvency of the firms that benefitted from the guarantees.

Graph I.4.9: **Stock of government guarantees, level and change 2020/19, by EU country**



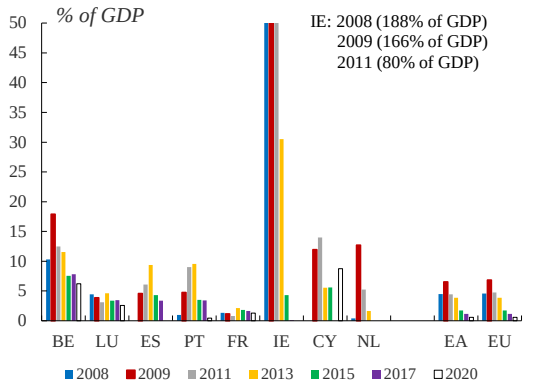
(1) The 2020-19 change shown on the RHS also captures the denominator effect (GDP drop in 2020).
Source: Eurostat.

Contingent liabilities and associated fiscal risks are expected to ease up in 2022. At time of the submission of the 2021 Draft Budgetary Plans, with containment measures phasing out and the ensuing recovery, the take-up of government guarantees related to the COVID-19 crisis was expected to have reached its peak, as many guarantee schemes had already expired. This is confirmed by information provided in the Draft Budgetary Plans (DBPs), which often foresee that the level of contingent liabilities will start declining from 2022, also reflecting the expected economic recovery (see European Commission, 2021). The information provided in the DBPs also highlights that, for some schemes, the actual take-up, reflected in government's actual contingent liabilities, remained modest compared to their initially announced maximum size.

Contingent liabilities related to government interventions to support financial institutions

A subset of contingent liabilities related to government interventions to support financial institutions have followed a downwards trend since 2013. Following an increase during and immediately after the financial crisis, the financial exposure of the government due to the financial stability schemes has been declining since 2013-14 in most Member States and in some countries already since 2012 (see Graph I.4.10). In 2020, the contingent liabilities linked to financial stability schemes were close to zero in most Member States. Exceptions are Cyprus (close to 9% of GDP), Belgium (6% of GDP), Luxembourg (2½% of GDP) and France (above 1% of GDP). Lower outstanding contingent liabilities in recent years reflect the fact that improved financial stability did not require a renewal of the expiring guarantees issued as part of support packages for financial institutions and that the creation of the Banking Union and its bank resolution framework provides a credible alternative to direct public support. Though going forward, the impact of the COVID-19 crisis on financial institutions remains uncertain (see next section).

Graph I.4.10: **Contingent liabilities linked to the financial sector interventions in the EU, 2008-2020**



Source: Eurostat.

4.2.3. Risks from contingent (implicit) liabilities related to the banking sector

A snapshot overview

In order to complement the analysis of potential (implicit) contingent liabilities, additional information is provided related to the banking sector (as in the previous report). This consists of a heat map reporting values of variables that indirectly capture potential building risks in the banking sector and that have proven in the past to be good leading indicators of banking – fiscal crises. Adverse developments in terms of private sector credit flows, bank loan-to-deposit ratios, non-performing loans and house prices, can represent substantial risks to the government's financial position in the future and thus give rise to contingent liabilities, though recent regulation, notably under the Banking Union, helps mitigate such risks.

Key financial indicators point to contained vulnerabilities, though the impact of the COVID-19 pandemic on credit quality as well as other indicators continues to be difficult to be precisely assessed. Based on available data, an overall reduction of non-performing loans (NPLs) ratios is observed (see also Graph I.4.11). Between mid-2020 and mid-2021, NPLs ratios continued to decline in most Member States, with more sizeable reductions in Greece (-15.5 pps.), Cyprus (-6.4 pps.), Italy (-2.3 pps.), Portugal (-1.5 pps.), and Bulgaria (-1.2 pps.) ([82]). As of 2021Q2, the NPL coverage ratio shows that in the majority of countries, NPLs are provisioned for in proportions of at least one third. Only in few cases, NPLs appear both high as a share of total loans, and provisioned for a level lower than 33% (e.g. Ireland – at around 28% - and Malta – at 30%). Provisions are below 50% in some countries with high legacy NPLs (Greece, with a coverage ratio at around 47% and Cyprus, with a coverage ratio at around 44%). Additional indicators point to contained vulnerabilities. Liquidity risks as indicated by the bank loan-to-deposit ratio are identified only in few Member States, e.g. in Denmark, Sweden, Finland and Luxembourg. Finally, developments of private sector credit flows and house prices flag low risks in most Member States.

Table I.4.3: **Potential triggers for contingent liabilities from the banking sector, by country**

	Private sector credit flow (% GDP)	Bank loan-to-deposit ratio (%)	NPL ratio (% of total gross loans)	NPL ratio change (pps.)	NPL coverage ratio (%)	House price nominal index change (%)
BE	1.1	97.5	1.7	-0.3	40.5	4.2
BG	4.2	66.9	**6.4**	-1.2	51.2	4.6
CZ	2.4	74.7	1.4	0.1	53.8	8.5
DK	4.8	**288.9**	2.0	0.2	**27.2**	5.1
DE	6.0	119.3	1.1	-0.1	35.4	7.8
EE	3.6	101.8	1.1	-0.4	**27.2**	6.0
IE	-1.8	77.7	**3.4**	-0.7	**28.3**	0.3
EL	5.4	67.1	**14.8**	-15.5	46.6	4.4
ES	4.4	103.2	**3.1**	0.1	40.8	2.2
FR	**13.0**	105.0	2.1	-0.3	49.4	5.2
HR	1.3	65.5	**3.9**	-0.4	62.0	7.7
IT	4.1	94.0	**3.7**	-2.3	53.5	1.9
CY	-2.6	54.8	**9.1**	-6.4	44.4	-0.2
LV	-1.8	68.0	1.7	-0.1	**30.9**	3.5
LT	0.3	63.1	0.9	-0.4	**26.8**	7.3
LU	**44.1**	**156.2**	1.5	**0.4**	36.7	**14.5**
HU	7.7	77.8	**3.6**	-0.8	63.8	5.0
MT	9.0	54.0	**3.2**	-0.3	**30.0**	3.4
NL	-1.3	112.6	1.7	-0.3	**26.4**	7.6
AT	4.7	94.9	1.9	-0.1	50.9	7.7
PL	1.5	83.7	**5.2**	**0.3**	59.8	10.5
PT	4.4	77.1	**4.2**	-1.5	58.4	8.4
RO	1.3	58.0	**3.8**	-0.4	66.9	4.7
SI	-0.9	60.8	**2.6**	-0.6	54.5	4.6
SK	3.7	105.2	1.8	-0.6	62.9	9.6
FI	6.5	**165.3**	1.4	-0.2	**30.7**	1.8
SE	11.6	**172.5**	0.4	-0.1	42.3	4.2

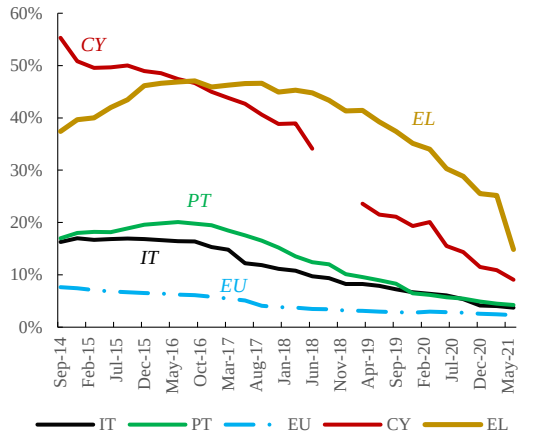
(1) Upper and lower thresholds (see Annex A1): (i) Private sector credit flow (% GDP): upper threshold 11.7%; lower threshold 9.4%; (ii). Nominal house price index (Y-o-Y Change): upper threshold 13.21%; lower threshold 11.0%; iii) Bank loans-to-deposits ratio: upper threshold 133.4%; lower threshold 107.0%; (iv). NPL ratio: upper threshold 2.3%; lower threshold 1.8%; (v). NPL ratio (Change): upper threshold 0.3 pps; lower threshold 0.2 pps; (vi) NPL coverage ratio: lower threshold 66%; upper threshold 33%.
Source: Eurostat (2020 – for private sector credit flows and change in house price nominal index), EBA(June 2021 – for other variables reported).

Caution is however warranted in interpreting these developments as the magnitude of the negative impact of COVID-19 crisis on banks'

([82]) This overall declining trend is also confirmed by ECB data.

balance sheets remains uncertain. Recent figures and risk indicators are affected by public support measures adopted by Member States (in particular, the introduction of loan moratoria and public guarantee schemes) and by monetary policy measures. ([83]) The borrower relief and liquidity support measures have mitigated the impact of the pandemic on bank balance sheets, so an increase in NPLs may have been deferred until the support measures would be phased out (European Commission, ECB and SRB, 2021). This should be borne in mind when interpreting recent figures and inferring the impact of the crisis (and of mitigating measures) on credit risk.

Graph I.4.11: **Non-performing loans ratio (% of total loans), EU average and selected countries**



Source: EBA

Implicit contingent liabilities from severe stress scenarios on the banking sector (SYMBOL model)

The analysis of potential contingent liabilities specifically related to the banking sector is completed by a 'module', based on model estimations of implicit contingent liabilities using bank stress scenarios (as in the previous reports).

The COVID 19 pandemic is a test of the European bank crisis management framework of unprecedented scale since its entry into force. While evidence points at resilience of the banks during the pandemic, validating past regulatory reform efforts, some financial stability risks remain. The COVID-19 pandemic also directly affects public finances, causing significant increases in public debt levels, and the needed measures to shelter the banks call for close monitoring, to avoid the onset of an adverse bank-sovereign 'doom loop' as seen in the past crisis.

Gauging the effect of the crisis on the banking sector is challenging as measures to offset its impact may affect the interpretability of available information. As such, in 2020, the EBA, the Commission, the ECB and the SRB ([84]) performed a useful assessments of the impact of COVID on the EU banking sector, with results pointing at a significant impact on asset quality and on non-performing loans developments.

The estimation of the potential impact on public finance ([85]) of the banks' losses presented here is estimated using SYMBOL (Systemic Model of Banking Originated Losses). The model has been developed by the European Commission's Joint Research Centre (JRC) and the Directorate General Financial Stability, Financial Services and Capital Markets Union (DG FISMA). Similarly to previous exercises, SYMBOL ([86]) uses

([83]) For a detailed discussion of this point see for instance the latest issue (November 2021) of the risk reduction monitoring report, jointly prepared by the services of the European Commission, the European Central Bank (ECB) and the Single Resolution Board (SRB), which provides a regular assessment on risk (reduction) within the Banking Union. See "Risk reduction monitoring report" https://www.consilium.europa.eu/media/52788/joint-risk-reduction-monitoring-report-november-2021-for-publication.pdf

([84]) See EBA (2020) and European Commission, ECB, SRB (2021).

([85]) Second-round effects, which would be linked to the fiscal consequences of possible bank failures, are not taken into account. As explained in European Commission (2016) Part 5.2.2 and in Part IV, Chapter 2 of European Commission (2011a), the relationship between the government's budget and banks' balance sheets is not uni-directional but rather circular and dynamic. Dynamic effects are, however, beyond the scope of the analysis presented here. It is not taken into account, for instance, that a downgrading of sovereign bonds reduces the value of bank assets and can lead to higher funding costs and further bank downgrading.

([86]) More details are reported in European Commission (2016). SYMBOL has been used by the European Commission for the ex-ante quantitative impact assessment of several legislative proposals (see Marchesi et al, 2012; European Commission, 2011b; Cariboni et al, 2012; Cannas et al, 2013; Cariboni et al, 2015), for the cumulative evaluation of the entire financial regulation agenda (ERFRA, European Commission, 2014a), and for the estimation of contingent liabilities linked to public support to the EU banking sector (European Commission, 2011a, 2012 and 2016; Benczur et al, 2015).

unconsolidated balance sheet data to assess the individual banks' losses in excess of their capital and the recapitalisation necessary to allow banks to continue to operate in case of distress. In particular, to account for the crisis environment, the SYMBOL assessment incorporates stress test results provided by the institutions mentioned above, and reports results under both a baseline and a stressed scenario (as done in the previous reports) ([87]).

The model estimates the potential residual costs on government budgets after all layers of the legal safety net available (capital, bail-in, resolution funds) have been deployed. The contingent liabilities due to a potential banking crisis are then split in government deficit and gross public debt. The implicit contingent liabilities that arise from the total funding needs, represented by the losses in excess of capital and recapitalization needs at 10.5% of the Risk Weighted Assets (RWA), are estimated for the short term and for the long term (ten year forward) scenarios (see Table I.4.4 for the results and Annex 6 for details on the methodology). On the one hand, bank losses in excess of capital after the safety net are assumed to be covered by public injections of funds to the banking sector, affecting public deficit and gross and net debt. On the other hand, recapitalization is deemed to be recoverable, since capital injection is done in exchange of shares (partial government ownership of the bank) being recorded as a financial transaction affecting neither the deficit nor the net debt, but only the gross debt through the stock-flow adjustment ([88]).

The COVID-19 outbreak, by disrupting economies, pose a challenge to both financial stability and public finances, heightening public debt sustainability risks, though the forceful policy response helped dampen the impact of the crisis and boost resilience. Financial reforms adopted after the great financial crisis strengthened banks risk management processes, helping address the current challenge. This also helped preserve banks credit flows to households, small businesses and corporates, cushioning the impact of the crisis and supporting the economic recovery ([89]). Coupled with direct government support to households and businesses ([90]), the improved regulatory environment mitigated the impact of the health crisis on bank balance sheets. Yet, a risk of a delayed adverse impact on the financial position of banks (e.g. non-performing loans) remains, notably as government support measures are phased out, or in case of a subdued or delayed recovery.

The analysis aims at quantifying the impact of banking losses on public finances while carefully accounting for the particular COVID 19 environment, notably its impact on the observed and potential bank's balance sheet developments. In practice, the model has been adapted to reflect increased risk of bank losses, when accounting for the fact that supportive measures are temporary. In particular, a correction for the RWA based on EBA Stress Test data is applied, and adjust risk measures for loans under public guarantees and moratoria, to better reflect risk in the banks portfolio and on the projected non-performing loans (NPL) developments. These adjustments are discusses in Box I.4.1 and based on Bellia et al 2022 (forthcoming).

Finally, to provide an up-to-date representation of the balance sheet of banks that covers important developments in 2021, we use the most recent aggregated data from the EBA Risk Dashboard (Q3 2021) to reflect such developments for loans under public guarantees, moratoria, NPLs and Regulatory Capital.

To ensure proper treatment of the impact of COVID-19 in the SYMBOL assessment, key adjustments are reflected in the baseline. This

([87]) This particular implementation of Symbol, tailored for the treatment of the COVID-19 environment, is detailed in Bellia et al, forthcoming (2022).

([88]) Under the assumption that such recapitalisations meet the following criteria of the Eurostat's decisions on the statistical recording of public interventions to support financial institutions and markets: the financial instrument used ensures a sufficient non-contingent rate of return and the State Aid rules are complied with (see March 2013 Decision and the earlier July 2009 Decision).

([89]) Regulators have allowed banks to release capital buffers, to defer the recognition of bad loans, and have recommended them to refrain from paying dividends with the final goal to deal with the consequences of the COVID-19 shock and provide lending to companies and households.

([90]) By the end of 2020, both EBA and ESRB data pointed at a substantial amount (around €500bls) of loans benefitting from (an uptake of) public guarantee, while a similar amount of loans benefitted from moratoria measures. However, according to latest figures the amount of loans covered by such measures has substantially declined.

includes reflecting the results of the EBA stress test in the SYMBOL baseline short-term scenario. Moreover, while loans under public guarantees are booked in the banks' balance sheet at a risk weight of zero, we adjust RWAs assuming such (new) loans have average riskiness to avoid understating risk of such loans in the challenging COVID-19 environment. In addition, in the SYMBOL simulation, losses associated to loans guaranteed by the state are directly transferred to public debt (without passing through the safety net cascade).

As in previous reports, NPL's effects on the banking sector is considered only in the short-term baseline scenario, as their effect is assumed to become negligible over the long-term. However, an adjustment is introduced to reflect an assumed delaying of adverse NPL developments due to moratoria ([91]). Specifically, we adjust the reported NPLs amount by adding to it the amount of Stage 2 loans under moratoria ([92]). Stage 2 loans have increased credit risk, indicating that they could become non-performing in the near future. Our adjustment reflects this fact in the NPL figure by assuming that Stage 2 loans that are under moratoria or expired moratoria would eventually become NPLs (see Box I.4.1).

The (adjusted amount of) NPLs is treated as in the previous reports. The baseline short-term scenario reflects how insufficient provisioning for NPLs may lead to overestimation of capital and to underestimation of potential losses in a banking crisis ([93]). The baseline modelling assumption is that non-collateralised NPLs count as loan losses for the system, while those that are collateralised (by immovable property) are redeemable subject to a recovery rate ([94]). Specifically, for each bank i and each country j, potential loans losses from NPLs are computed as follows:

$$NPLs\ Losses_{i.j} = \left(1 - CollShares_{i.j}\right) \times NPLs_{i.j} + CollShares_j \times NPLs_{i.j} \times \left(1 - RR_j\right) - Provisions_{i.j}$$

where RR is the recovery rate ([95]) and $CollShares$ represents the proportion of total loans covered by collateral, i.e. implicitly assuming that this proportion is also representative for the subset of NPLs ([96]). Provisions and NPLs are, respectively, the amount of provisions and gross non-performing loans declared by banks in their balance sheet. The extra loan losses that comes from the NPLs calculated as per the above equation are then added to those coming from the SYMBOL simulation before the intervention of any safety net tools.

The results are obtained as follows. In previous reports the results where calibrated to match the severity of the 2008-2012 crisis ([97]), i.e. a severe and systemic crisis event. In this round we introduce a new yet equivalent characterisation of the crisis event, relying on the so-called Expected Shortfall approach, measured on the tail of the loss distribution, using realization of extreme values of the common factor as a reference to calculate the losses. In practice, we select all the simulations where the factor is above a threshold (values of the common factor above 3 standard deviations) to compute the Expected Shortfall of the portfolio, namely the average value in the tail of the distribution, which represents the expected value of the portfolio losses in a crisis event. This calibration of the Expected Shortfall computation is in line with the crisis event defined in previous reports. Second, as indicated above, the impact of (existing) NPLs is considered only in the short-term. Third, a (conservative) assumption is made, whereby all simulated banks' excess losses and recapitalisation needs that cannot be covered by the safety net fall on public finances. Fourth, the

([91]) The ECB introduced a specific package concerning the treatment of NPLs, allowing banks to exercise flexibility for the classification of the debtors in the case of exposures covered by moratoria. See for details Budnik et al. (2021).

([92]) Using EBA aggregated data on loans under moratoria and under Stage 2.

([93]) The new regulation on the prudential backstop for non performing exposures is not taken into account in the current set up.

([94]) Note that this approach may entail a bias of different kind (and sign) depending on the circumstances and the type of loans – e.g. in the of difficult foreclosure of household mortgages (leading to loss underestimation) or when household's mortgages command better recovery rates than applicable to firms (leading to loss overestimation).

([95]) Based on country data provided by the World Banks in its Flagship Report "Doing Business 2020" available here.

([96]) Based on ECB data.

([97]) Bank losses and recapitalisation needs triggered by the last crisis are proxied by state aid data, in particular the total recapitalisation and asset relief provided to banks over 2008-12 (around 615 bn euro), see European Commission's DG Competition State Aid Scoreboard, European Commission (2014b) and Benczur et al. (2015).

safety net is assumed to prevent the onset of any contagion effects ([98]). Finally, in the main scenario, non-significant banks are liquidated, and significant banks might be recapitalised or liquidated. In particular, the model accounts for the possibility of liquidation of a significant entity even if supervised by the ECB. This assumption is consistent with the fact that entities under direct ECB supervision do not go automatically into resolution, as the SRB decides on a case-by-case basis whether the resolution of the bank would be in public's interest, while practical cases have confirmed the relevance of this interpretation. To model the decision on public interest, we divide the banks in three groups: GSIBs, significant entities (excluding GSIBs) and non-significant entities. We associate every group with a probability of going into resolution if failing or likely to fail. For GSIBs and their subsidiaries this probability is set to 100% (i.e. GSIBs will be always resolved); for significant entities we take into account a 80% resolution probability and the remaining institutions will always go into insolvency when failing (i.e. with resolution probability equal to 0%) ([99]).

The stressed scenario is constructed with the following features:

As in previous reports, to mimic a fire sales mechanism, increased asset correlation is calibrated in line with the importance of common shocks. During a financial crisis, banks will sell assets to keep their liquidity positions. If many banks are exposed to the same shock, this will have a negative impact on the asset value (i.e. fire sales environment). The intensity of this mechanism is linked to size of the common shock, which underpins the degree of asset correlation.

As in previous reports, NPLs losses are modelled by linking the level of recovery rates to the level of the common shock. This hypothesis takes into account that markets force banks to clean up their balance sheets during a financial crisis. NPLs are liquidated and the losses arising from this forced sale depends on the recovery rate for NPLs. The higher the common shock, the larger the markets pressure is to clean up balance sheets. As pointed out before, the amount of NPL is increased to take into account the current moratoria on loans.

Under all scenarios, the required level of recapitalization is set at 10.5% of RWA, for each bank, representing the minimum level of capital and capital conservation buffer set by the CRDIV. The extra capital buffers built for G-SIIs are also to be recapitalised ([100]).

In term of results, Table I.4.4 **shows that under the short-term (2022) baseline scenario ([101]) the estimated budgetary impact of a major crisis, ([102]) is negligible for all countries, with losses not exceeding 1% of the GDP. Similarly, in the long-term (2032) baseline scenario, where current NPL stocks' effects are assumed negligible, final losses are negligible for most countries.**

Hence, under the baseline, results show that contingent liabilities does not have a significant impact on public finances under the short-term and long-term baseline scenario.

Under the more extreme (stressed) scenario, results are more severe, with combined losses and recapitalisation needs exceeding 1% of GDP in many countries and largest effects witnessed for Cyprus, Spain, Greece and Luxembourg (i.e. all above 2% of GDP). In the long-term stressed scenario, only Spain and Luxembourg have losses that exceed 1% of GDP, although linked to recapitalisation needs rather than excess losses, which partly reflects the large size of the banking sector in these countries.

([98]) Potential contagion across banks through bail-in (some of the losses absorbed by the safety net re-entering the banking system) is disregarded due to scarce data. Contagion across GSIBs due to the bail in has been already addressed by the new banking package, where cross-holdings of TLAC instruments are to be deducted between G-SIBs.

([99]) Up until last year, for DSA exercises, the standard assumptions were either that only significant institutions go into resolution, or that all banks go into resolution. The current set up is thus more favorable to resolution funds, because a share of the significant banks (20%) is now supposed to go into liquidation.

([100]) O-SIIs buffers are not taken into account due to unavailability of data and technical limitation in identifying the subsidiaries of all OSI.

([101]) With loans under public guarantees, moratoria, NPLs and Regulatory Capital reflecting data up to 2021Q3, provided by EBA.

([102]) That is impact due to excess bank losses and recapitalization needs, after cascade intervention of regulatory tools.

Table I.4.5 **presents the *probability* of having implicit contingent liabilities of higher than 3% of GDP hitting public finances ([103]).** The colour coding of the heat map reflects the relative magnitude of the theoretical probabilities of such an event (see Annex 6 for the details of heat map calculation and calibration). Contingent liabilities would not have a potentially significant impact on public finances, under the baseline scenario for any country. Under the more extreme (stressed) scenario, some countries post some probability of their public finances being hit by losses of (at least) 3% of GDP.

Table I.4.4: **Implicit contingent liabilities from banks' excess losses and recapitalisation needs, under alternative scenarios (% GDP 2020)**

Scenarios:	Initial (2022) short term scenarios				Final (2032) long term scenarios			
	Baseline		Stressed		Baseline		Stressed	
	(a)		(b)		(a)		(b)	
	Excess losses	Recap needs 10.5%	Excess losses	Recap needs 10.5%	Excess losses	Recap needs 10.5%	Excess losses	Recap needs 10.5%
	To deficit and debt	Directly to debt	To deficit and debt	Directly to debt	To deficit and debt	Directly to debt	To deficit and debt	Directly to debt
AT	0.0%	0.2%	0.1%	0.9%	0.0%	0.1%	0.0%	0.3%
BE	0.0%	0.2%	0.1%	0.8%	0.0%	0.1%	0.0%	0.4%
BG	0.0%	0.1%	0.1%	0.5%	0.0%	0.0%	0.0%	0.1%
CY	0.1%	0.5%	0.4%	4.8%	0.0%	0.1%	0.1%	0.5%
CZ	0.0%	0.1%	0.1%	0.3%	0.0%	0.0%	0.0%	0.2%
DE	0.0%	0.1%	0.0%	0.4%	0.0%	0.0%	0.0%	0.2%
DK	0.0%	0.1%	0.1%	0.3%	0.0%	0.1%	0.0%	0.2%
EE	0.0%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.1%
ES	0.2%	0.6%	0.3%	2.6%	0.0%	0.2%	0.1%	1.1%
FI	0.0%	0.1%	0.1%	0.4%	0.0%	0.0%	0.0%	0.2%
FR	0.1%	0.3%	0.2%	1.4%	0.0%	0.1%	0.1%	0.6%
EL	0.1%	0.5%	0.3%	3.0%	0.0%	0.2%	0.1%	1.0%
HR	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.1%
HU	0.1%	0.1%	0.1%	0.2%	0.0%	0.0%	0.0%	0.1%
IE	0.0%	0.2%	0.1%	1.4%	0.0%	0.1%	0.1%	0.6%
IT	0.2%	0.3%	0.3%	1.4%	0.0%	0.1%	0.0%	0.6%
LT	0.0%	0.1%	0.0%	0.4%	0.0%	0.0%	0.0%	0.1%
LU	0.1%	0.8%	0.2%	3.9%	0.0%	0.3%	0.2%	1.9%
LV	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
MT	0.1%	0.1%	0.1%	0.5%	0.0%	0.0%	0.0%	0.2%
NL	0.0%	0.2%	0.1%	0.9%	0.0%	0.0%	0.0%	0.3%
PL	0.1%	0.1%	0.1%	0.4%	0.0%	0.1%	0.0%	0.2%
PT	0.1%	0.2%	0.1%	1.0%	0.0%	0.1%	0.0%	0.6%
RO	0.0%	0.1%	0.1%	0.3%	0.0%	0.0%	0.0%	0.1%
SE	0.0%	0.1%	0.1%	0.2%	0.0%	0.0%	0.0%	0.1%
SI	0.0%	0.1%	0.1%	0.8%	0.0%	0.0%	0.0%	0.3%
SK	0.0%	0.1%	0.1%	0.4%	0.0%	0.0%	0.0%	0.2%

Source: Commission services.

([103]) The theoretical probability of public finances being hit by more than a certain share of GDP is directly linked with the magnitude of implicit contingent liabilities presented earlier, the results in the heat map are highly correlated with those in Table 5.2. However, other factors such as a high concentration of a banking sector may also increase the theoretical probabilities presented in the heat map.

Table I.4.5: **Theoretical probabilities of public finances being hit by more than 3% of GDP, in the event of a severe crisis (i.e. involving excess losses and recapitalization needs in at least three different EU countries)**

	Initial (2022) short term scenarios		Final (2032) long term scenarios	
	Baseline	Stressed	Baseline	Stressed
	(a)	(b)	(a)	(b)
AT	0.02%	0.38%	0.00%	0.20%
BE	0.05%	0.54%	0.03%	0.38%
BG	0.00%	0.17%	0.00%	0.07%
CY	0.19%	4.49%	0.03%	0.45%
CZ	0.01%	0.17%	0.00%	0.10%
DE	0.01%	0.13%	0.00%	0.08%
DK	0.07%	0.25%	0.03%	0.16%
EE	0.02%	0.13%	0.00%	0.06%
ES	0.30%	2.26%	0.10%	1.01%
FI	0.04%	0.32%	0.02%	0.25%
FR	0.10%	0.84%	0.04%	0.45%
EL	0.21%	2.62%	0.07%	0.95%
HR	0.00%	0.04%	0.00%	0.04%
HU	0.01%	0.06%	0.01%	0.04%
IE	0.08%	0.94%	0.04%	0.49%
IT	0.07%	0.85%	0.03%	0.43%
LT	0.01%	0.10%	0.00%	0.03%
LU	0.39%	2.53%	0.14%	1.30%
LV	0.00%	0.01%	0.00%	0.01%
MT	0.04%	0.39%	0.02%	0.22%
NL	0.08%	0.64%	0.02%	0.28%
PL	0.00%	0.14%	0.00%	0.12%
PT	0.04%	0.59%	0.02%	0.46%
RO	0.00%	0.05%	0.00%	0.02%
SE	0.04%	0.17%	0.02%	0.06%
SI	0.01%	0.33%	0.00%	0.12%
SK	0.01%	0.14%	0.00%	0.10%

(1) Green: low risk (probability lower than 0.50%), Yellow: medium risk (probability between 0.50% and 1%); Red: high risk (probability higher than 1%).
Source: Commission services.

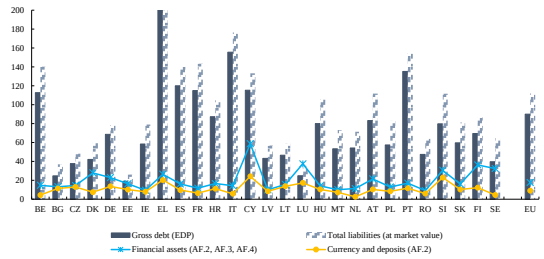
4.3. GOVERNMENT ASSETS AND NET DEBT

In 2020, net debt ([104]) was close to 18 pps. of GDP lower than gross debt in the EU, with differences varying between 9 pps. of GDP and close to 60 pps. of GDP for individual Member States. This essentially reflects the large variation of government financial assets across Member States, which is due to the set-up of pension systems, the past materialisation of contingent events, or country-specific fiscal policies such as maintenance of large cash buffers. The difference between gross and net debt was more than 30 pps. of GDP for Slovenia, Sweden, Finland, Luxembourg and Cyprus (see Graph I.4.12) and 20-30 pps. in the cases of Austria, Germany, Greece and Denmark. For Luxembourg, among the

([104]) Measured as the difference between, on the one hand, EDP debt and, on the other hand, financial assets in the form of currency and deposits (AF.2), debt securities (AF.3) and loans (AF.4).

Member States with the lowest gross debt, net debt is even negative as the value of financial assets exceeds the outstanding government debt at face value. The difference between gross and net debt is less than 10 pps. of GDP for Romania, Ireland and Latvia. Among the Member States considered, for those with the highest government debt, i.e.. Greece, Italy, Portugal, Spain and France, net debt is around 15 pps. of GDP lower than gross debt (though for Greece, the difference is higher at more than 25 pps. of GDP due to large cash buffers). Also in net terms, these countries have the highest debt burden among EU Member States. Overall, country rankings for indebtedness are similar when comparing gross and net debt.

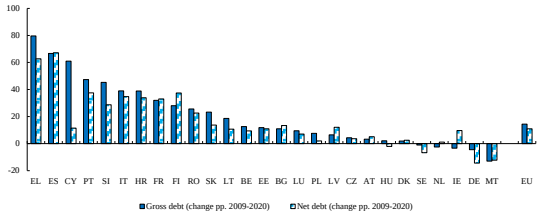
Graph I.4.12: **Gross debt, total liabilities, and financial assets in 2020 (% of GDP)**



Source: Commission services, based on Eurostat.

Some exceptions aside, gross and net debt rose synchronously over the past decade in the EU (see Graph I.4.13). In Malta, Germany and Sweden, both variables decreased between 2009 and 2020. In the majority of Member States, debt increased under both gross and net terms over the last decade. A large (positive) difference between changes in gross and net debt is found for Cyprus. In this country, gross debt rose by more than 60 pps. of GDP between 2009 and 2020, while over the same period, net debt only increased by 12 pp. of GDP. The large-scale financial sector rescue operations led to higher deficits and debt but also involved the accumulation of financial assets. This example illustrates how net debt figures help interpret increases in gross debt that result from financial assistance to the private sector.

Graph I.4.13: **Change in gross and net government debt ratio (pp. of GDP, 2009-20)**



(1) The following financial assets are considered for the calculation of net debt: currency and deposits (AF.2), debt securities AF.3) and loans (AF.4).
Source: Commission services, based on Eurostat.

Box I.4.1: Details on SYMBOL adjusted data: RWA, Guarantees and Moratoria

This box presents adjustments to SYMBOL-based analysis to address specificities of the COVID-19 ([1]). The crisis and the associated government measures deployed affect the development and the (direct) interpretability of a set of key indicators underpinning SYMBOL-based analysis. To account for these aspects in the SYMBOL-based analysis, adjustment was introduced for the treatment of information relating to Risk Weighted Assets (RWA), loans under public guarantees and loans under moratoria. Moreover, in order to capture most recent developments for NPLs, guarantees, moratoria and Regulatory Capital, most recent aggregated data (Q3 2021) reported by EBA are used.

1. REGULATORY MEASURES AND REPRESENTATIVENESS OF THE ACTUAL RISK WEIGHTED ASSETS

Balance sheet data for Q4 2020 point at a decrease in RWA density compared to 2018. At EU level, the RWA density goes from 40.9% in 2018 to 37.6% in 2020. Given the strong economic downturn due to the COVID-19 crisis, this development is likely to be driven by the extraordinary measures put in place by the regulators, as those have a substantial impact on internal risk evaluation for reporting purposes. As such, reported RWAs by banks potentially underestimate actual riskiness of banks' portfolios.

To account for a potential bias on the reported RWAs, we apply a correction coefficient based on the results of the most recent EBA stress test ([2]). The EBA performed a stress test exercise to evaluate the impact on banks of adverse market developments, under a baseline and an adverse scenario, at different time horizons (from end of 2021 to end of 2023). The correction applied to RWAs ensure that, in the short term, riskiness of banks are in line with the adverse scenario depicted by EBA.

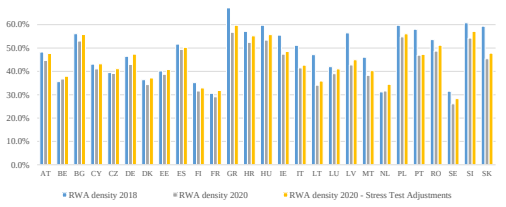
Table 1 shows the impact of the correction on RWAs levels. The average increase for the RWAs of banks is around 5%, though for some Member States (notably DE, FR, and NL) the RWA would increase by more than 9%, following the EBA-based correction. Noteworthy, despite this correction, RWAs density still remain lower than in 2018 in most cases (see Graph 1).

Table 1: **EBA stress test based adjustment of RWAs**

AT	+6.7%	IE	+2.4%
BE	+3.2%	IT	+2.9%
BG	+5.3%	LT	+5.3%
CY	+5.3%	LU	+5.3%
CZ	+5.3%	LV	+5.3%
DE	+10.2%	MT	+5.3%
DK	+8.3%	NL	+9.1%
EE	+5.3%	PL	+2.4%
ES	+1.8%	PT	+0.7%
FI	+4.1%	RO	+5.3%
FR	+9.2%	SE	+8.5%
EL	+5.3%	SI	+5.3%
HR	+5.3%	SK	+5.3%
HU	+4.4%		

(1) Percentage change adjustment of RWAs based on adverse EBA scenario (end of 2021).
(2) In red, missing data replaced by standard assumption: we assume average increase of available data for the Member States included in the stress test exercise.
Source: Elaboration on EBA stress Test data (2021).

Graph 1: **RWAs in 2018 compared to 2020 unadjusted data and EBA-adjusted data.**



Source: Commission services.

2. PUBLIC GUARANTEES SCHEME

Loans guaranteed by the State during the COVID-19 crisis bear a zero risk weight. Yet losses on such loans would directly impact public finances. Risks associated to such loans, which likely increased due to the crisis, would need to be

([1]) The analysis presented here is based on Bellia et al (forthcoming 2022).
([2]) The EBA Stress Test, released on 30/07/2021, contains data on 50 banks from 15 EU and EEA countries and covers around 70% of the EU banking sector assets. See https://www.eba.europa.eu/risk-analysis-and-data/eu-wide-stress-testing

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Box (continued)

properly reflected, notably via an adjustment of the bank's RWAs.

Relying on EBA ([3]) aggregated data on new loans under guarantee as of Q3 2021 (Table 2), we measure the increase in losses in SYMBOL simulations that would prevail if an average risk weight would be assumed for these loans. This adjustment proceeds as follows. First, for each bank in our sample we adjust the RWA, assuming that the new loans under guarantee bear same average riskiness as observed for other loans in the bank's portfolio. Second, SYMBOL is used to measure the increased losses that these adjusted RWAs for all banks would imply.

The additional losses related to adjusted (i.e. increased) risk weight of loans under guarantee are directly transferred to public finances. As losses on guaranteed loans are covered by the guarantor (i.e. the state), the additional (gross) losses do not impact the capital of the concerned institution. Instead, simulations directly transfer losses to deficit (excess losses) or debt (recapitalisation) ([4]).

Table 2: **Data used for Guarantee-based adjustment of RWAs**

	RWA credit risk (EBA sample)	GL (EBA sample - Excluding Guarantees)	New loans guaranteed (EBA sample)	RWA (EBA sample)	New RWA (EBA sample)	Guarantee-based adjustment of RWAs
	A	B	C	D	E = (A/B)*C	E/D
AT	252.05	562.73	4.19	298.47	1.88	+0.63%
BE	330.38	900.82	1.42	400.12	0.52	+0.13%
BG	18.03	29.62	0.37	19.70	0.23	+1.15%
CY	16.94	26.90	0.40	19.32	0.25	+1.31%
CZ	44.74	136.67	2.04	53.22	0.67	+1.26%
DE	783.20	2,545.21	12.52	1,027.63	3.85	+0.37%
DK	157.60	621.95	0.78	190.77	0.20	+0.10%
EE	14.28	37.97	0.04	15.97	0.01	+0.08%
ES	1,183.99	2,275.38	106.19	1,381.08	55.26	+4.00%
FI	179.72	514.48	1.43	222.14	0.50	+0.23%
FR	2,202.72	5,325.80	114.03	2,588.65	47.16	+1.82%
EL	147.94	204.60	5.56	165.30	4.02	+2.43%
HR	22.84	41.15	0.10	25.60	0.06	+0.22%
HU	45.99	62.96	2.04	51.96	1.49	+2.87%
IE	191.41	221.50	1.31	224.52	1.14	+0.51%
IT	837.71	1,739.01	116.51	1,004.05	56.13	+5.59%
LT	8.00	25.31	0.01	9.02	0.00	+0.03%
LU	88.11	142.29	0.10	101.89	0.06	+0.06%
LV	5.20	13.32	0.00	5.85	0.00	+0.01%
MT	7.83	16.24	0.29	8.76	0.14	+1.62%
NL	509.43	1,848.89	3.33	648.87	0.92	+0.14%
PL	94.95	115.68	3.87	110.12	3.17	+2.88%
PT	147.75	242.08	7.42	170.28	4.53	+2.66%
RO	19.31	33.57	1.21	25.45	0.70	+2.73%
SE	146.21	798.39	0.10	247.85	0.02	+0.01%
SI	16.76	23.39	0.23	19.68	0.17	+0.85%
SK	21.81	46.21	0.70	24.00	0.33	+1.37%

Source: Commission services on EBA data.

3. LOANS UNDER MORATORIA AND NPLS

Despite the challenge posed by the COVID-19 environment, NPL ratios continued to decline in most countries (see Graph 2). These developments are underpinned by the regulatory measures introduced in the midst of the crisis. In particular, the treatment of NPLs was revised to allow flexibility with regard to the classification of debtors in the event of moratoria. Similarly, loans under guarantee that become non-performing have a preferential prudential treatment in terms of loan loss provisioning ([5]). These measures affect interpretability of reported NPL amounts. In addition the amount of NPL in the balance sheet of banks have strongly decreased in some cases due to securitization ([6]).

([3]) Data for loans under guarantees come from the EBA risk dashboard, see https://www.eba.europa.eu/risk-analysis-and-data/risk-dashboard.

([4]) Since the actual portfolio of loans includes both positions with and without guarantees, we subtract the guaranteed loans (with zero risk weight) from the total amount of gross loans to have an accurate representation of the riskiness for the banks' portfolio. The updated amount of gross loans serves as a reference to estimate the RWA amount for the credit risk without public guarantees.

([5]) See Budnik et al. (2021).

([6]) Notably in the case of Greece, where the NPL ratio decrease from 41.2% in 2018 to 10.49% as of Q3 2021, as discussed in the Enhanced Surveillance Report for Greece (November 2021) linked below: https://ec.europa.eu/info/publications/twelfth-enhanced-surveillance-report_en.
While details on the Greek securitization program are described in the corresponding state-aid decision (SA.53519(2019/N)), available here: https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_53519.
Details on a similar, notable, securitization program in Italy are described in the corresponding state-aid decision (SA.43390 (2016/N)), available here: https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_43390.

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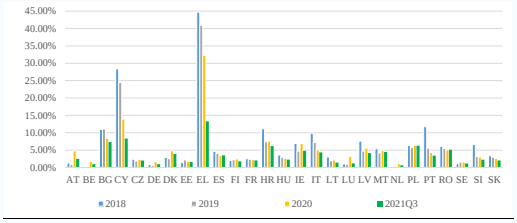
Box (continued)

Regulatory measures rolled-out during the crisis tend to substantially delay the process of loans under moratoria eventually turning into an NPL. To illustrate, if a new loan is under moratorium and the debtor default on the first payment, it would take (at least) six months for the loan to be registered as NPL, under the (adjusted) rules.

Given the timeline of the rollout of moratoria (and guarantee) schemes, end-2020 balance sheet data are likely severely under-reporting NPLs. Such schemes were rolled out mostly throughout 2020 and considering the time needed to process, disburse and start repaying new loans (usually at least 3 months), only a limited amounts of new NPLs would be registered in 2020, due to the extended time needed for loans to be registered as NPL under the new agreed standards.

Graph 2: **Historical NPL Ratio (NPL over Gross Loans)**



Source: Commission services, Orbis Bankfocus data.

To address the potential significant delay in NPL reporting we rely on Stage 2 loans data. Stage 2 loans identify loans where credit risk has increased significantly, though they are not yet registered as NPLs. EBA provides the following useful loan breakdown, per country (Table 3):

– Amount of loans that are under moratoria or where the moratoria has expired.

– Amount of loans that are in Stage 2.

– Amount of loans that are already non-performing.

To identify the issue of NPL reporting delays associated to new rules on moratoria, we use data on loans under moratoria that are also Stage 2. Table 3 reports recent loans under (active or expired) moratoria in column B, while column C reports the amount of those loans that are also Stage 2. These loans are seen as potential NPL, although the registering of these as such is delays by the fact that they were under moratoria. The share of loans under moratoria that are also Stage 2 is shown in column D. This share is around 30% on average although significant difference exist for that proportion across countries.

To adjust the NPL stock for the delay due to the moratoria, we refer to the share of loans that are under moratoria and are Stage 2, in proportion of total loans (Table 3 column E). We assume that this share provides a proxy for the relevance of this issue for a given country. That is, for a given country the larger the share of its loans being under moratoria and Stage 2 the larger the amount of NPL reporting that are delayed due to the new moratoria rules. This share is thus directly used to adjust upwards the amount of reported NPL for the year 2020. To illustrate this adjustment in terms of NPL amounts, Graph 3 report unadjusted and moratoria-adjusted NPLs.

Table 3: **Data used for Moratoria-based adjustment of NPLs**

	Total Loans	Loans Under Moratoria (Non expired and expired)	Loans Under Moratoria that are Stage 2	Proportion of Loans Under Moratoria that are Stage 2	Moratoria-based adjustment of NPLs
	A	B	C	D = B/C	E = C/A
AT	566.92	27.35	10.50	38.4%	+1.9%
BE	902.24	36.10	7.73	21.4%	+0.9%
BG	29.99	2.19	0.72	33.0%	+2.4%
CY	27.30	8.42	2.80	33.3%	+10.3%
CZ	138.72	-	-	-	+1.2%
DE	2557.73	20.01	3.73	18.6%	+0.1%
DK	622.74	-	-	-	+1.2%
EE	38.00	0.70	0.14	19.8%	+0.4%
ES	2381.57	159.96	34.75	21.7%	+1.5%
FI	515.91	7.49	0.17	2.2%	+0.0%
FR	5439.82	217.49	42.28	19.4%	+0.8%
EL	210.16	23.19	9.04	39.0%	+4.3%
HR	41.25	3.97	0.03	0.8%	+0.1%
HU	65.00	13.55	0.00	0.0%	+0.0%
IE	222.81	19.94	8.98	45.0%	+4.0%
IT	1855.52	154.56	51.03	33.0%	+2.8%
LT	25.32	0.27	0.07	24.9%	+0.3%
LU	142.39	3.19	0.61	19.1%	+0.4%
LV	13.32	0.28	0.09	32.0%	+0.7%
MT	16.54	1.16	0.29	25.1%	+1.8%
NL	1852.22	42.13	9.00	21.4%	+0.5%
PL	119.54	12.82	5.45	42.5%	+4.6%
PT	249.50	35.81	9.42	26.3%	+3.8%
RO	34.78	2.56	1.23	47.9%	+3.5%
SE	798.49	26.23	0.28	1.1%	+0.0%
SI	23.62	2.24	0.44	19.8%	+1.9%
SK	46.90	3.69	1.32	35.7%	+2.8%

(1) In red, missing data replaced by standard assumption: we assume an increase of 1.5%, which corresponds to the weighted of data available for the other Member States.
Source: Aggregated data from EBA risk dashboard, reference date 2021Q3.

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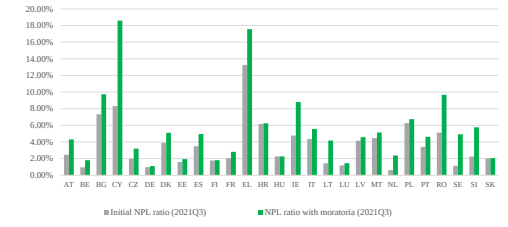
Box (continued)

Graph 3: **Impact of adjustment of NPL to account for delaying effect of moratoria**



Source: Aggregated data from Orbis Bankfocus and Commission services, reference date 2021Q3.

Box I.4.2: Gross and net debt: concepts and measures

The debt concept used in this report is general government debt, also referred to as 'Maastricht debt' or 'EDP debt' ([1])**.** It comprises financial liabilities related to the following debt instruments: currency, deposits, debt securities and loans ([2]). The stock of *gross consolidated* debt at year-end is measured at *nominal* (face) value rather than at market value. Making use of gross debt means that government-owned assets vis-à-vis counterparts outside the general government are not netted out. The fact that figures are consolidated across the general government sector means that any liability of which the counterpart is another general government unit is netted out.

The use of gross government debt, which is central in the EU's fiscal surveillance framework, has a number of advantages. The choice of gross debt as benchmark indicator was laid down in the Treaty ([3]). It is a widely used concept, allowing for international comparison. When assessing risks of fiscal stress, gross debt is the obvious starting point considering that it summarises governments' contractual financial obligations and reveals the magnitude of eventual refinancing needs.

Yet, government assets also impact public finances in several ways and might provide useful supplementary insights. On the one hand, government-held assets can become a source of fiscal risks. This is, for example, the case when state-owned companies run into financial difficulties. On the other hand, government assets generate revenue, such as interests or dividends, which are included in the structural balance calculations and thus accounted for in debt projections, as well as in the S1 and S2 indicators. In addition, government assets can theoretically help to reduce debt when sold off. In practice however, effective control, marketability, liquidity, earmarking of financial means and societal concerns can limit this possibility. In addition, the valuation of assets is intricate, in particular for non-financial assets ([4]).

Net government debt offsets gross debt with certain types of financial assets. It is defined as "gross debt minus financial assets corresponding to debt instruments" (IMF, 2013). Net debt thus provides a measurement of how much gross debt would remain after liquidating financial assets to redeem part of the outstanding debt. It should be noted that financial assets are marked-to-market when possible. As a result, in the EU context, net debt entails adding up two items that are valued in a different way as EDP debt is valued at nominal value. This also means that valuation effects will be present only for the marked-to-market financial assets and will fluctuate along the economic cycle. Because of the differences in valuation of assets and liabilities, and, most importantly, given the conceptual shortcomings for policy use, Eurostat does not publish official net debt figures. However, Eurostat does publish total government liabilities, measured at market value, which are generally higher in percent of GDP than the Maastricht debt ratio due to both larger scope ([5]) and valuation effects included on the liabilities side.

Net debt is found to have a significant effect on financing costs and the occurrence of fiscal crises, though the direct impact of

([1]) General government includes central government, state government, local government and social security.
([2]) Maastricht debt does thus exclude monetary gold and SDRs; equity and investment fund shares; insurance, pensions and standardised guarantee schemes; financial derivatives; and other accounts payable such as trade credits.
([3]) Art. 126 and Protocol 12 of the Treaty on the Functioning of the European Union.
([4]) See Box 5.1 of the FSR 2018.
([5]) For more details on the differences in scope and definition between EDP debt (Maastricht definition) and total government liabilities, please see Box 5.1 of the DSM 2019.

(Continued on the next page)

Box (continued)

assets is less clear. According to Gruber and Kamin (2012), there is a robust and significant effect of fiscal positions, including net debt, on long-term bond yields for OECD countries. Relatedly and in line with previous research, Berti et al. (2012) highlight that net debt is an important predictor of fiscal stress episodes (the European Commission's S0 early-detection indicator of fiscal stress includes the variable). Ichiue and Shimizu (2015) confirm that net debt helps explain forward rates for a group of advanced economies but find that assets as such do not ([6]). Henao-Arbelaez and Sobrinho (2017) find that the presence of financial assets does not significantly reduce sovereign spreads and the probability of debt crises in advanced economies, contrary to what is the case for emerging economies.

The difference between gross and net debt can be substantial. For instance, when governments sell financial assets, this may not immediately affect their gross debt figures (Eurostat, 2014). Alternatively, when governments intervene to recapitalise financial institutions, gross debt rises but the parallel acquisition of a portfolio of financial assets might fully or partly neutralise the operation's impact on net debt ([7]). Evidently, asset quality could be an issue in such a scenario and the marketability of such assets would realistically be limited in the near term. Moreover, the valuation of financial assets is based on observed market values. As a result, their value might drop substantially in the event of rising market pressures. The sale of large amounts of government assets might itself induce negative effects on market valuation. Also maturity mismatches between liabilities and assets need to be reckoned with. In sum, interpreting net debt indicators requires caution and case-by-case analysis.

Which financial assets should be considered to compute a concept of net debt that would be relevant for assessing debt sustainability, varies depending on their capacity to mitigate risks. In keeping with the Maastricht debt definition, the net debt concept discussed in this chapter considers financial assets in the form of currency, deposits, debt securities and loans, i.e. the same categories that compose gross debt on the liability side, while debt is measured at nominal (face) value. A more risk-based approach would be to restrict assets to those that are considered highly liquid, such as currency and deposits and certain debt securities, which could be more relevant for determining the capacity to pay debt obligations in stressed situations and assessing liquidity position to honour high gross financing needs. The challenge of conducting the debt sustainability analysis based on a concept of net debt is in determining the appropriate scope and valuation of assets/liabilities ([8]).

([6]) Assets matter, however, for resilience during crisis episodes: IMF (2018a) found that countries that enter recessions with strong balance sheets seem to experience shallower and shorter recessions.

([7]) Only the operations which are considered to take place at market price are recorded as financial transactions, resulting in acquisition of assets, whereas any excess paid by the government over the market price would require recording of government expenditure (capital transfer). Moreover, even when an operation is deemed to take place at market price, it would impact the net debt calculation used in this chapter when the underlying instruments are debt securities or loans, but not in the case of equity holdings.

([8]) See for a more detailed discussion, Box 5.1, Chapter 5, 2018 Fiscal Sustainability Report.