



SUBJECT: Financial Study update

SUBMITTED BY: President of the European Patent Office

ADDRESSEES: 1. Budget and Finance Committee (for information)
2. Administrative Council (for information)

SUMMARY

The consultant Oliver Wyman and Mercer have been mandated by the EPO to perform an independent assessment of the EPO's current financial situation and its future evolution. The first phase of this assessment consists in an as-is analysis, an evaluation of the financial risks and their impact and a strategic financial assessment.

As-is analysis

The report includes an analysis of the EPO's current financial and operational situation using the Financial Study 2019 (CA/46/19) and financial statements up to 2022 as starting points. The analysis is based on the same methodology as the 2019 assessment. In addition, all financial measures implemented with CA/18/20 have been assessed regarding their initial development and impact within the timeframe 2019-2022.

Risk matrix and impact

This report provides a holistic risk framework and taxonomy for the EPO. Based on this framework, potential risks to the EPO's financial sustainability have been identified and have been evaluated in an outside-in analysis. All relevant risks for the Financial Study 2023 have been assessed in terms of their probability of occurrence and their financial impact. Based

on this risk matrix, parameters have been identified that are relevant for the sensitivity analysis performed under the strategic financial assessment.

Strategic financial assessment

The strategic financial assessment includes the set-up of a financial model including simulated financial statements. The operating business of the EPO is used to forecast the financial performance and orientations of the EPO with a 20-year horizon (e.g., production, workforce, revenues, salaries, investments). Parameters were defined for use in a Base Case. A coverage gap is evaluated as at 2042, based on the funding requirement and the available cash surplus. To determine how robust the Base Case is to changes in the operational and financial environment, sensitivities were calculated for the parameters classified as relevant by the risk assessment.

All stakeholders will be given the opportunity to comment on the outcomes of the study. In a second phase starting in Q1 2024, the discussions will focus on the possible ways forward.

The Financial Study will be distributed in English language only.

Recommendation for publication: Yes.



EUROPEAN PATENT OFFICE

Financial Study 2023

Deliverable 1: As-is analysis

29 September 2023

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List of abbreviations

AAG	Actuarial Advisory Group
BN	Billion
CAGR	Compound Annual Growth Rate
DBO	Defined Benefit Obligations
D1	Deliverable 1 As-Is Analysis
D2	Deliverable 2 Base Case scenario
D3	Deliverable 3 Risk matrix and impact
D4	Deliverable 4 Strategic financial assessment
ECB	European Central Bank
EOP	End of period
EP	European Patent
EPC	European Patent Convention
EPO	European Patent Office
EPOTIF	European Patent Office Treasury Investment Fund
FTE	Full-time equivalent
GDP	Gross Domestic Product
IAS	International Accounting Standards
IFRS	International Financial Reporting Standards
IRF	Internal Renewal Fees
K	Thousand
MN	Million
MTBP	Medium Term Business Plan
NPS	New Pension Scheme
NRF	National Renewal Fees
OPS	Old Pension Scheme
P.A.	Per annum
PCT	Patent Cooperation Treaty
PGP	Patent Granting Process
PPH	Products per Head
PP	Percentage points
R&D	Research and Development
RFPSS	Reserve Funds for Pensions and Social Security
SSP	Salary Savings Plan
S/E	Searches per Examinations ratio
SEO	Search, Examination, Opposition
YoY	Year-on-Year

1. Context and purpose of this document

1.1. Mandate of the Financial Study 2023

The main financial objectives of the European Patent Office (EPO) consist in ensuring its long-term financial sustainability and its institutional and operational independence. As the EPO is a self-financed organisation, it is of paramount importance to regularly monitor its financial situation and review its financial management and governance in a volatile economic context. The EPO mandated Oliver Wyman and Mercer to perform an independent assessment of the EPO's current financial situation and its future evolution. This engagement follows the prior engagement of Oliver Wyman and Mercer for the Financial Study 2019.

The Financial Study 2023 addresses this mandate in three distinct phases:

Phase 1 includes an As-is analysis, which assesses the current operational and financial situation of the EPO including an assessment of the impact of the six measures that were implemented following the Financial Study 2019. Additionally, this Financial Study 2023 provides a view on future financial performance and orientations of the EPO on IFRS basis over a 20-year time horizon for one Base Case using sensitivities for relevant financial and operational parameters as well as an estimate as to whether the EPO can meet its future financial obligations. All results have been forecasted based on a proprietary financial model that has been built solely for this Financial Study. All underlying assumptions of the model and its functionality are transparent and have been discussed with and validated by key stakeholders across the EPO. The results of Phase 1 provide initial findings, but at this stage do not provide any managerial recommendations as to which actions the EPO management should take and decide to communicate to relevant stakeholders. This is the case especially for all non-financial aspects of the engagement.

Phases 2 and 3 will build on the findings of Phase 1 to propose tailored measures to ensure long-term financial sustainability. This includes a proposal for an asset-liability management strategy, containing the investment strategies for RFPSS and EPOTIF.

The Financial Study 2023 is for the exclusive use of the EPO. The opinions expressed in it are valid only for the purpose stated herein and as of its date. No obligation is assumed to revise the Financial Study 2023 to reflect changes in events or conditions that occur after this date. The Financial Study 2023 is not, for any purpose, to be reproduced, quoted, modified, sold, distributed, or otherwise provided, in whole or in part, to any other person or entity without the prior written permission of Mercer and Oliver Wyman. There are no third-party beneficiaries with respect to the Financial Study 2023, and neither Mercer nor Oliver Wyman accepts any liability to any third party.

Information furnished by others, upon which all or portions of this study are based, is believed to be reliable but has not been independently verified, unless otherwise expressly indicated. Public information, as well as industry and statistical data, is from sources that we deem to be reliable. As such, Mercer and Oliver Wyman make no representations or warranties as to the accuracy of the information presented. Neither do they take any responsibility or liability (including for indirect, consequential or incidental damages) for any error, omission or inaccuracy in the data supplied by any third party.

Mercer and Oliver Wyman have prepared the Financial Study 2023 for the EPO (together the "parties") for the purpose of assisting the EPO in understanding any financial risks associated with its business, as set out in the terms of an engagement letter between the parties dated 28 April 2023. Unless agreed otherwise in writing, Mercer and Oliver Wyman do not accept any liability or responsibility to any third party in respect of this study.

The Financial Study 2023 contains confidential and proprietary information belonging to Oliver Wyman and Mercer and is intended for the exclusive use of the parties to whom Oliver Wyman and Mercer provided this information.

The findings, ratings and/or opinions contained in the Financial Study 2023 contain projections based on current data and historical trends. Any such projections are subject to inherent risks and uncertainties. Neither Oliver Wyman nor Mercer accepts responsibility for actual results or future events. Past performance does not guarantee future results. All decisions related to the implementation or use of advice or recommendations contained in this study are the sole responsibility of the EPO. The Financial Study 2023 does not represent investment advice, nor does it provide an opinion regarding the fairness of any decision to any and all parties.

1.2. Previous Financial Studies and their differences from the Financial Study 2023

The first independent Financial Study was conducted in 2010 to review the EPO's financial situation and forecast its long-term financial sustainability. Its results formed the basis for reforms between 2011 and 2015, which were proposed by the EPO's senior management and approved by the EPO's member states.

As the economic environment is constantly evolving, it is necessary to frequently assess and review the reforms, as well as the evolution of the EPO's long-term financial position. This need led to additional Financial Studies in 2016 and 2019.

In 2010, the scenario analysis reaffirmed certain structural challenges to the EPO, such as rising total salary costs (comprising basic salaries and social security costs), declining equity and liquidity, and the potential need for additional funding. The 2016 study focussed on production and productivity and suggested a close monitoring of factors determining the EPO's financial situation. The study recommended that the EPO should maintain the financial performance it achieved during the period from 2011 to 2016 and prepare for the potential influences of external factors, such as the digitisation of business models and competing patent systems. Actions included the launch of the European Patent Office Treasury Investment Fund (EPOTIF) and measures to increase productivity.

The Financial Study 2019 used a proprietary financial model to forecast financial statements with a 20-year time horizon. Additionally, a comprehensive employee benefit model was built to ensure an acceptable probability of being able to pay future benefits out of available cash. Finally, the Financial Study 2019 allowed for different performances of the RFPSS and EPOTIF based on capital market scenarios and strategic asset allocation. Subsequent measures, proposed by the EPO's senior management and approved by the EPO's member states, were implemented between 2019 and 2022.

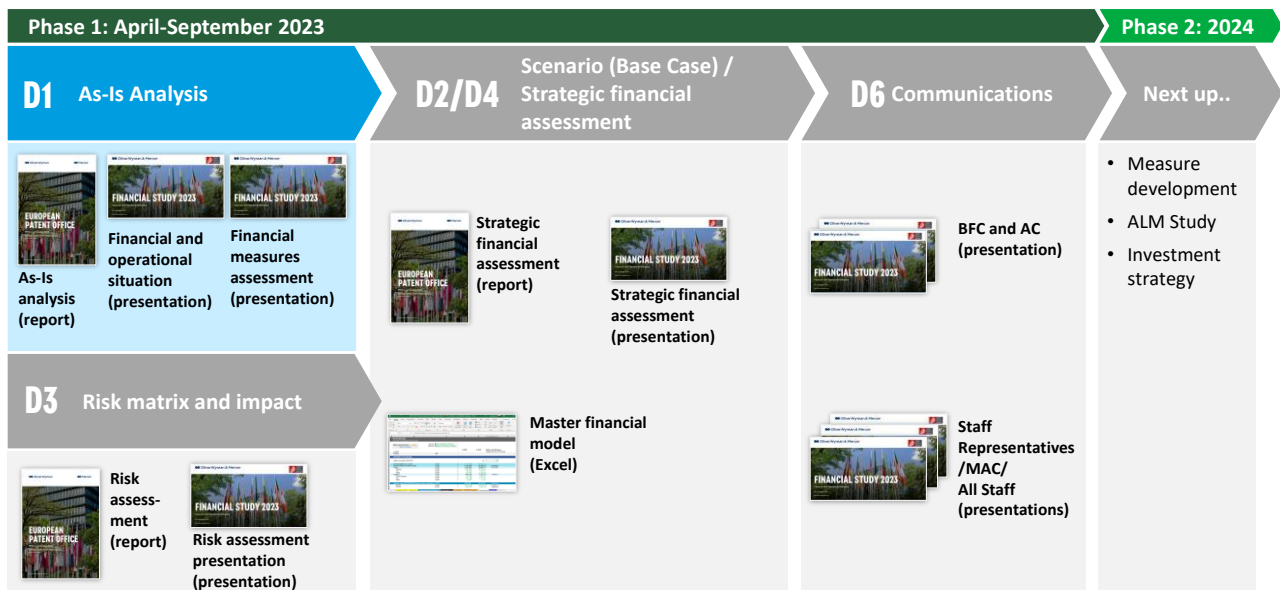
Since the Financial Study 2019, Europe has faced geopolitical, societal and economic developments including the Covid-19 pandemic, the Russian invasion of Ukraine, high inflation, and a return to a positive interest rate environment induced by central banks following the high inflation. These developments affect macroeconomic parameters and have had a significant impact on the EPO's operations (e.g., through the introduction of new working methods) and on its finances.

The Financial Study 2023 was used to independently assess the EPO's current financial situation and its evolution in the future based on a single Base Case scenario. Compared to previous Financial Studies, there was a special focus on sensitivities to financial and operational parameters to determine how robust the Base Case scenario is to changes in the operational and financial environment.

1.3. Approach

The Financial Study 2023 has been structured to provide a meaningful representation and analysis of the status quo and an assessment of sensitivities to future macroeconomic developments. The study is intended as a basis for further discussion and to support the development of risk-mitigating decisions by the EPO’s management and relevant stakeholders. Overall, the Financial Study 2023 contains the following deliverables (Figure 1).

Figure 1: Deliverables Overview



As-Is Analysis: Financial and operational situation and financial measures assessment (D1)

The report includes an analysis of the EPO’s current financial and operational situation using the Financial Study 2019 and financial statements up to 2022 as starting points. To enrich the assessment, interviews with stakeholders were carried out for hypothesis testing and gap identification. The analysis is based on the same methodology as the 2019 assessment with no additional assumptions. In addition, all financial measures implemented with CA/18/20 have been assessed regarding their initial development and impact within the timeframe 2018-2022.

Risk matrix and impact (D3)

This report provides a holistic risk framework and classification for the EPO. Based on the framework potential risks to the EPO’s financial sustainability have been identified and have been evaluated in an outside-in analysis. All relevant risks for the Financial Study 2023 assessed in terms of their probability of occurrence and their financial impact. Based on this risk matrix, parameters have been identified that are relevant for the sensitivity analysis performed under the strategic financial assessment.

Strategic financial assessment (D2, D4)

The strategic financial assessment includes a financial model including simulated financial statements (D4). The operating business of the EPO is used to forecast the financial performance and orientations of the EPO with a 20-year horizon (e.g., production, workforce, revenues, salaries, investments). Parameters were defined for use in a Base Case (D2). A coverage gap or surplus is projected for 2042¹, based on the funding

¹ Coverage gap or surplus is projected for 2042 and deflated to 2022 values.

requirement and the available cash surplus. To determine how robust the Base Case (D2) is to changes in the operational and financial environment, sensitivities were calculated for the parameters classified as relevant by the risk assessment.

1.4. Purpose of this document

This report covers the analysis of the financial and operational situation as well as the financial measures assessment as part of the as-is analysis (D1). Oliver Wyman and Mercer have analysed the EPO's current financial and operational situation as well as developments in recent years. The analysis of the EPO's current financial and operational situation focuses on the period between 2018 and 2022, without making any future projections. As the EPO's financial sustainability depends by its very definition on future developments, this report should be understood as a summary of today's situation and does not represent an assessment of the EPO's financial sustainability.

Complementary to the analysis of the financial and operational situation, this report also contains a financial measures assessment. Oliver Wyman and Mercer have conducted an impact assessment of the measures implemented with CA/18/20. All measures are devised so that the largest part of their impact comes in the medium to long term. Hence, this exercise should be considered as a check based on a snapshot in time taken shortly after the implementation of the measures. The impact assessment is backward looking and focuses on impacts that occurred between 1 January 2020 and 31 December 2022 without making any projections of future impact. The assessment is based on audited financial statements (IFRS pure²) as well as the so-called IFRS standardised view (in which a standardised discount rate is used to steer the organisation). All figures in this report should be understood as guidance for the purposes of management, and they do not represent an accurate accounting view.

² IFRS pure corresponds to the audited IFRS financial statements where a discount rate derived from AA-Bond is applied, while IFRS standardised corresponds to a standardised discount rate used to steer the organisation

2. Financial and operational situation

2.1. Macroeconomic environment

Europe has faced geopolitical, societal and economic developments since the Financial Study 2019, including the Covid-19 pandemic, the Russian invasion of Ukraine, high inflation rates and a return to a positive interest rate environment. These developments affect macroeconomic parameters and have had a significant impact on the EPO's operations (e.g., through the introduction of new working methods) and on its finances.

The three macroeconomic parameters with the largest impact on the EPO were inflation, gross domestic product (GDP) and the European Equity Index. These are analysed in detail in this section.

The average annual inflation rate was 3.1% between 2018 and 2022. While annual inflation was 0.3% in 2020, it increased to 8.4% in 2022 because of rising energy prices and the post-pandemic economic recovery. As a result of the rise in inflation, the European Central Bank (ECB) raised its policy rate, which led to a marked increase in yields derived from the Euro iBoxx[®] indices for AA-rated corporate bonds. This development resulted in an increase in IFRS discount rates for long-term employee benefit expenses, from a range of 1.5% to 2.0% in 2018 to a range of 3.7% to 4.0% in 2022.

Changes in GDP and research and development (R&D) expenditure are important long-term drivers of the EPO's incoming workload. Globally, GDP growth was similar in all regions, except for China. Chinese GDP grew at an average of 4.4% per annum (p.a.) from 2018 to 2022, stronger growth than in the rest of the world. European GDP grew moderately in 2018 and 2019 and then contracted significantly in 2020 due to the Covid-19 pandemic. But Europe recovered from recession in 2021, when economic support measures were implemented. The average annual GDP growth rate between 2018 and 2022 was 1.1% in the Eurozone. R&D expenditure is taking up an increasingly large share of national GDP worldwide: Korea leads the way with a 5% share of national GDP. The development of the two variables that are interrelated, as innovation can drive GDP growth, can be used as an indication of incoming workload in the long-term.

The European Equity Index increased at 8.3% p.a. between 2018 and 2022, though it fluctuated strongly due to the Covid-19 pandemic, and increased uncertainty in the financial markets due to the Russian invasion of Ukraine. The year-on-year (YoY) change in the index was 27.2% in 2019 and -11.0% in 2022.

2.2. Operational development

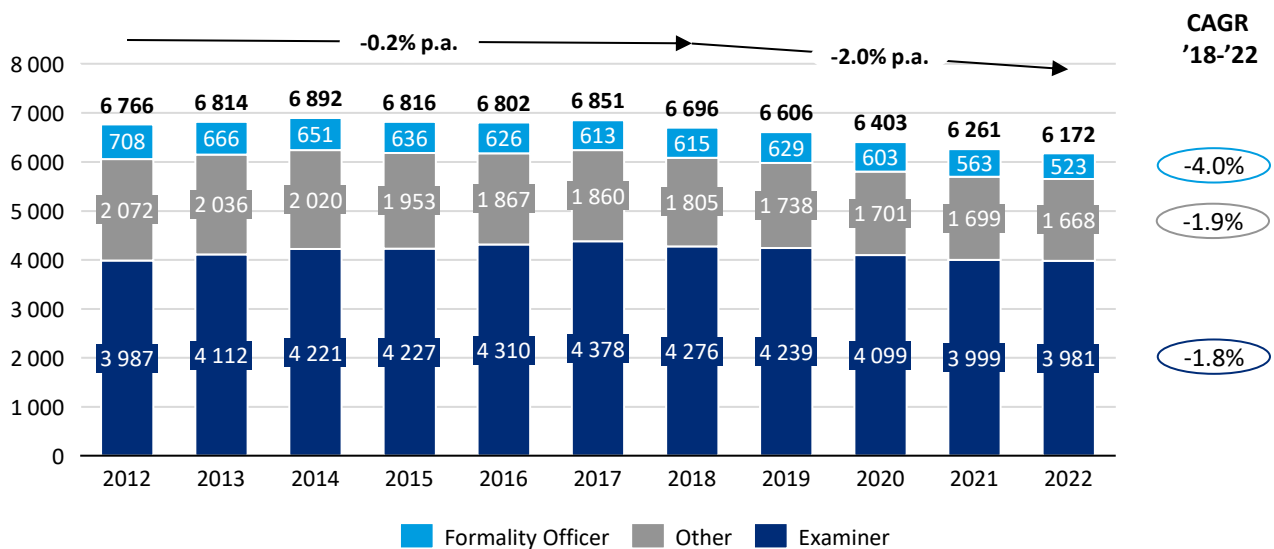
Operational priorities have shifted considerably since the Financial Study 2019. A focus on timeliness (Early Certainty initiative³) was replaced with business continuity efforts during the Covid-19 pandemic. But the focus is now moving back to productivity in the light of challenges with future timeliness achievements. The incoming workload has increased above expectations, especially during the pandemic, while the headcount has shrunk, and EPO productivity declined. The latter is attributable to the shift in operational priorities. These changes have caused a steady build-up of Search, Examination, and Opposition (SEO) stock. An overall decrease in production is mainly attributable to a) a decrease in workforce and b) a decrease in EPO productivity. These factors, together with higher-than-expected incoming workload levels, have led to a significant stock increase. Both production and stock are key drivers of the EPO's revenue and will be analysed in the sections below.

³ In the course of the Early Certainty initiative in the second half of 2014, the EPO set itself the goal to conduct searches within six months after filing, and Examinations within 12 months after an Examination request

2.2.1. Workforce

Until 2018, the total number of employees remained relatively stable at around 6 800. But thereafter, the total number of employees declined at -2.0 % p.a. between 2018 and 2022, from 6 696 in 2018 to 6 172 in 2022. The decrease between 2018 and 2022 amounted to approximately 500 employees⁴, as can be seen in Figure 2. The decrease can be explained by the replacement ratios applied during after 2019: Anticipated productivity gains due to digitisation drove target replacement ratios to 0% for formality officers, 80% for examiners and 50% for all other staff. The replacement ratios realised after 2019 were 46% for examiners, 0% for formality officers and 33% for other staff.

Figure 2: Headcount, in #, by job category, 2012-2022



2.2.2. Incoming workload

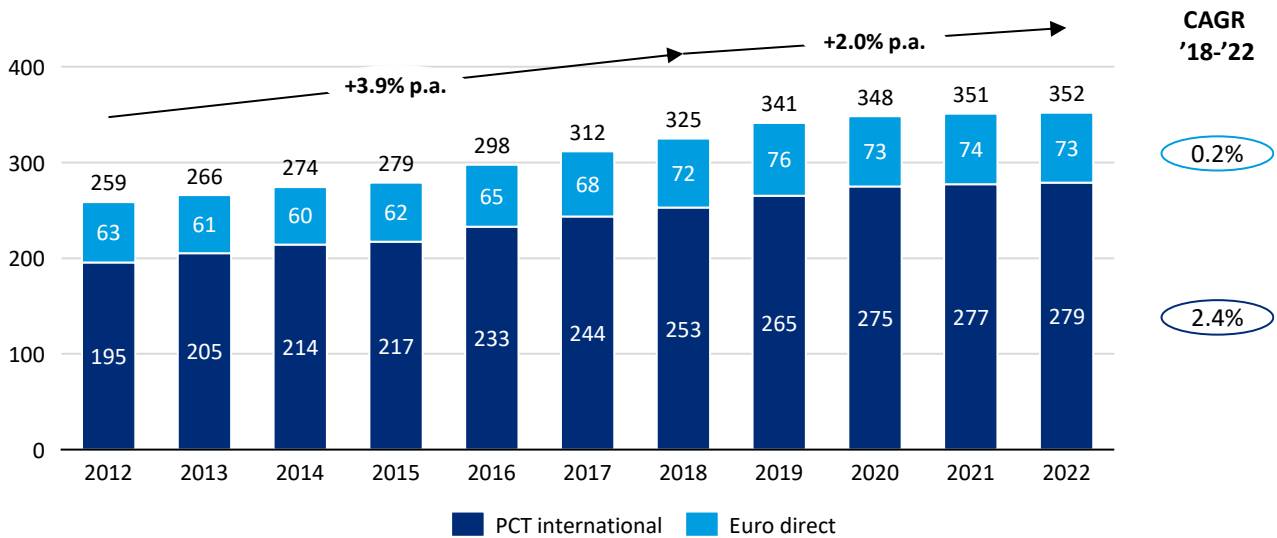
Examiner’s workload is defined through patent demand. Incoming workload can be described through different indicators, including the number of European Patent (EP) filings, the number of applications, new product orders and examiner workload.

The number of EP filings, used as a proxy to foresee the EPO’s future workload, corresponds to the total number of filings made at the EPO as well as all filings made via the international Patent Cooperation Treaty (PCT). Some of the latter filings might not result in an application at the EPO or in EPO workload, depending on the choice of International Searching Authority and on the choice of entry point for the regional phase. Applications are the number of patent applications filed under the European Patent Convention (EPC) (Euro-direct) and Euro-PCT that enter the regional phase at the EPO (Euro-PCT regional phase). New product orders (Search) correspond to all applications or third-party cases for which a Search request has been made. These are also referred to as new Search cases, and they indicate the upper limit of potential examiner workload for Search cases. Finally, the incoming examiner workload, including doublures (Search), is the number of Searches filed and paid for that have a pre-classification and are distributed to a unit. This number is representative of examiners’ Search workload. The incoming examiner workload, including doublures (Search), is used to define the actual need for resources based only on those cases for which a Search is performed, and a Search report is drawn up.

⁴ Excluding Young Professionals (125 in 2022)

Figure 3 is showing that EP filings consistently increased between 2012 and 2018, at an average rate of 3.9% p.a., before growing at a slower rate of 2.0% p.a. to 352k in 2022. The increase in filings was mainly driven by international PCT filings, which accounted on average for almost 80% of the total, while euro-direct filings accounted for 20%.

Figure 3: Total number of EP filings, in k#, by type, 2012-2022

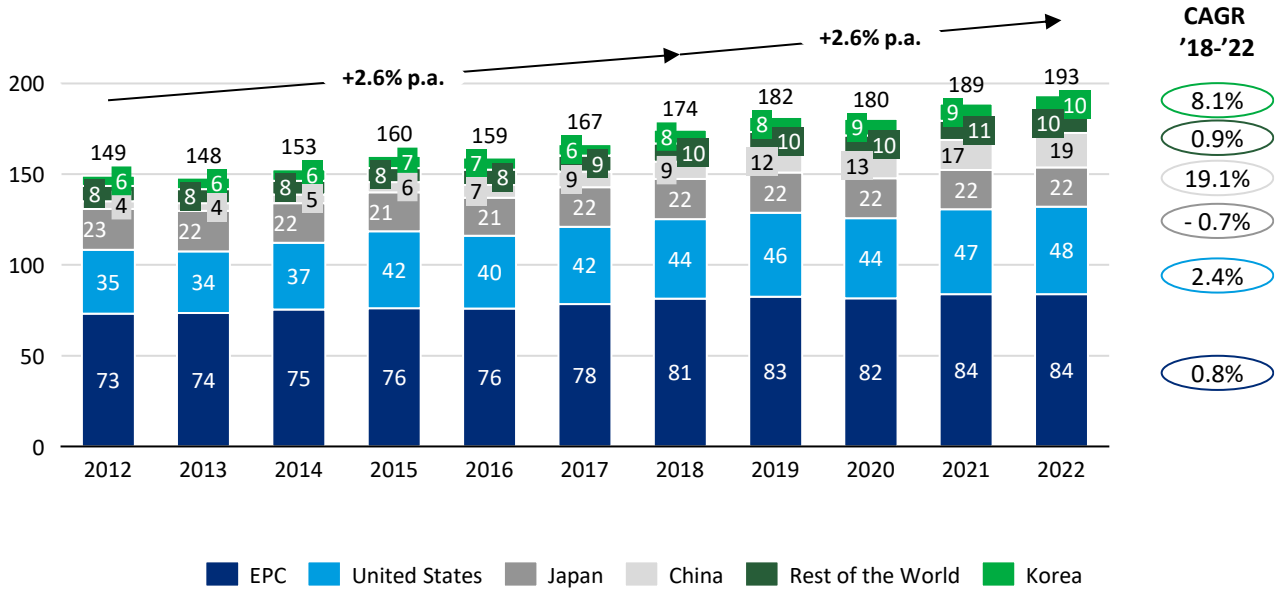


Applications at the EPO developed in the same direction as the number of EP filings⁵. However, applications grew at a faster pace than filings after 2018: 2.6% p.a., mainly driven by an increase from 180k in 2020 to 193k in 2022 (Figure 4). That compares with a rate of 2.0% p.a. for filings, reflecting lower growth in PCT international filings⁶. The growth of applications over the past two years reflects the combined effect of a number of longer-term macroeconomic trends. These include continued dynamic growth in China and (to a lesser extent) in Korea, continuous growth in the United States and a slight decline in Japan. Numbers filed under the EPC have been flat, reflecting a decline in Germany while the economies of other EPC countries grew.

⁵ The number of EP filings is the sum of euro-direct applications filed and PCT international filings

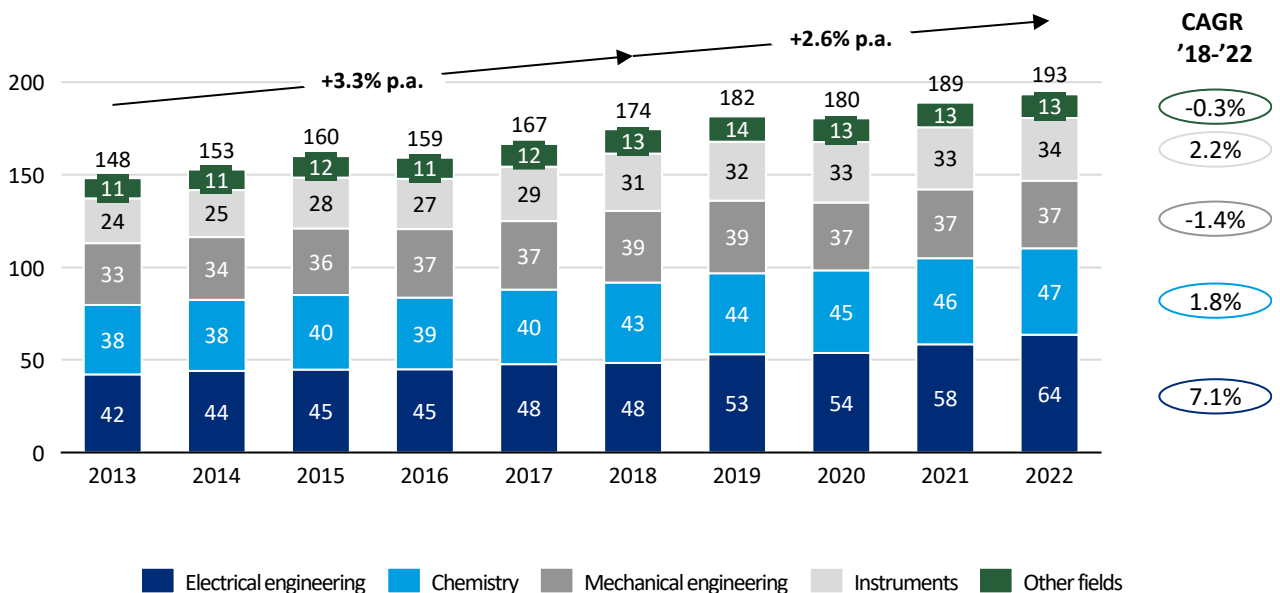
⁶ This does not translate into a commensurate reduction in the growth rate of applications

Figure 4: Total number of applications, in k#, by country of residence of applicant, 2012-2022



When looking at the application growth per sector in Figure 5, electrical engineering grew the fastest, at 7.1% p.a. This was followed by chemistry and instruments, at 2.2% p.a. between 2018 and 2022. Applications grew at 3.3% p.a. between 2012 and 2018 and continued to grow at 2.6% p.a. between 2018 and 2022.

Figure 5: European patent applications by field of technology⁷, in k#, by sector, 2013-2022

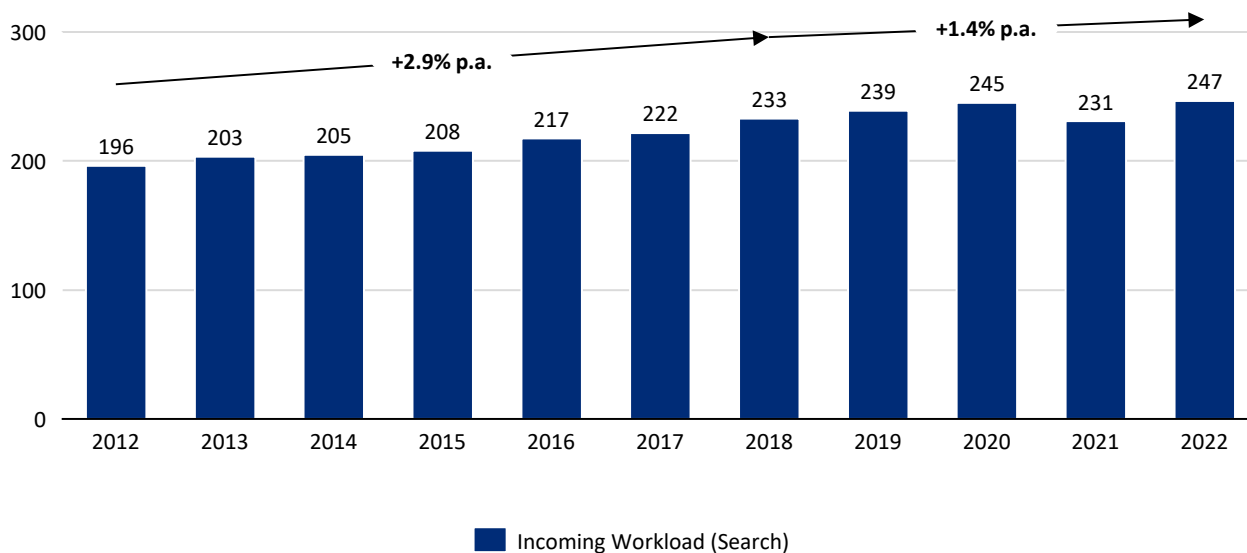


In line with the growing number of applications, the workload measured by Search products increased from 2012 to 2022, as can be seen in Figure 6. In addition, in all the years under assessment, the examiner workload was higher than indicated just by the number of applications at the EPO, since the EPO performs Search orders for certain national patent offices (IT, FR, BE, NL, LU, GR, CY and UK) and for other third

⁷ The section "Other fields" includes unclassified applications

parties. Incoming workload (Search)⁸ increased in the period under consideration, reaching new highs in 2022 with 252k new Search product orders and 247k Search products translating into actual workload. The drop in Search workload in 2021 stemmed from an overall decline in applications the year before.

Figure 6: Incoming examiner workload, including doublures (Search), in k#, 2012-2022



2.2.3. SEO production, capacity and EPO productivity

The production of the EPO is defined through the production in Search, Examination and Opposition, the examiner capacity and the average productivity.

SEO production refers to the examiners' activity associated with each step of the Patent Granting Process (PGP), primarily Search, Examination, and Opposition activities performed.

Capacity shows how an examiner's time is divided on average between Search, Examination and Opposition activities, as well as core and non-core activities (aside from SEO production) and indicates average sick times and absences.

EPO productivity can be expressed through products per head (traditionally) and through products per full-time equivalent (FTE). The difference between the two indicators is that PPH is calculated based on the average examiner headcount in DG1 while for products per FTE this headcount is corrected for unpaid capacity, incapacity and non-core time (section III investments⁹). To indicate productivity within the PGP (examiner efficiency), time per Search and time per Examination are used excluding the impact of the ratio of Searches to Examinations (the S/E ratio).

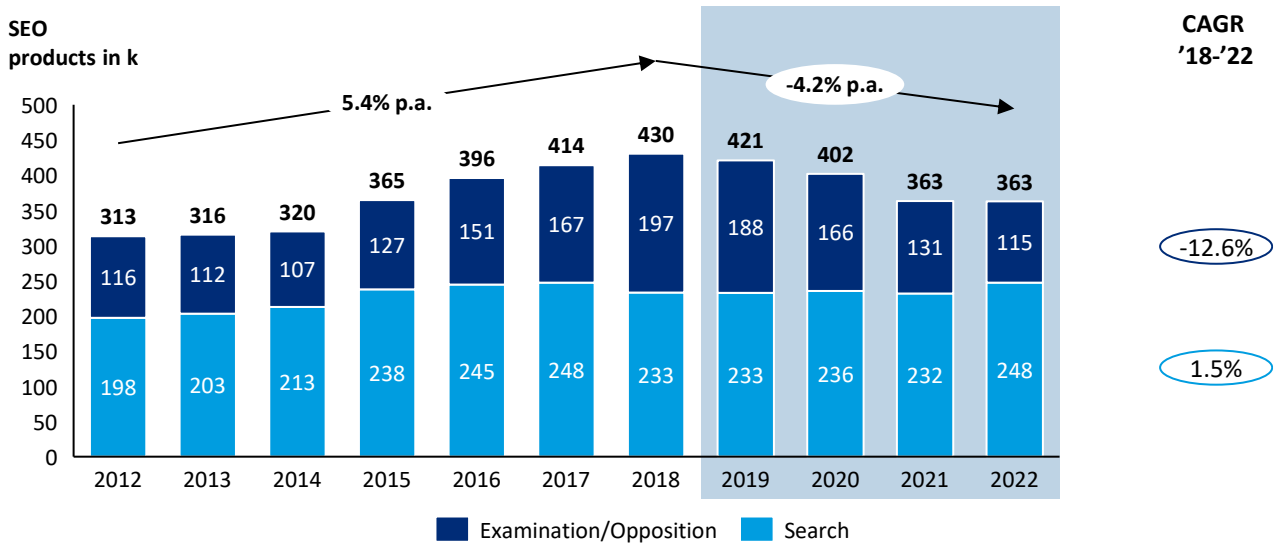
Figure 7 shows total SEO production between 2012 and 2022. After peaking in 2018 (430k products), total SEO production declined to 363k in 2022 (a rate of -4.2% p.a.), as Examination and Opposition decreased (-12.6% p.a.) and Searches increased (1.5% p.a.). The overall decline was driven by two factors with similar

⁸ The number of Searches filed and paid for having a pre-classification and distributed to a unit. This number is representative of the Search workload of examiners

⁹ Core investments are also referred to as section II investments and consist of about 50% training and about 50% other investments including team management. Non-core investments (section III investments) relate to DG 5 or BIT support and participation in strategic programmes

impacts. First, a decrease in the workforce (-7.7% examiner-man-years from 2018 to 2022) accounted for about 47% of the production decline from 2018¹⁰. Second, a decrease in EPO productivity (-8.7% from 2018 to 2022) accounted for about 53% of the production decline¹¹. Productivity of the EPO comprises both examiner efficiency and the share of examiner time spent on SEO production. Particularly in 2021, the EPO’s operations were characterised by a focus on the health of staff and accommodating new digital ways of working, resulting in a decrease in EPO productivity and production.

Figure 7: SEO production, in k#/#, 2012-2022



While the EPO productivity, both for PPH and products per FTE, decreased from 2018 to 2022 (Figure 8), examiner efficiency within the PGP improved for Search and worsened for Examination (Figure 9). Between 2018 and 2022, the number of PPH decreased from 94 to 87, while the number of products per FTE decreased from 103 to 99. This trend is in line with the average productivity development in the European Union¹² and can be attributed to external and internal factors.

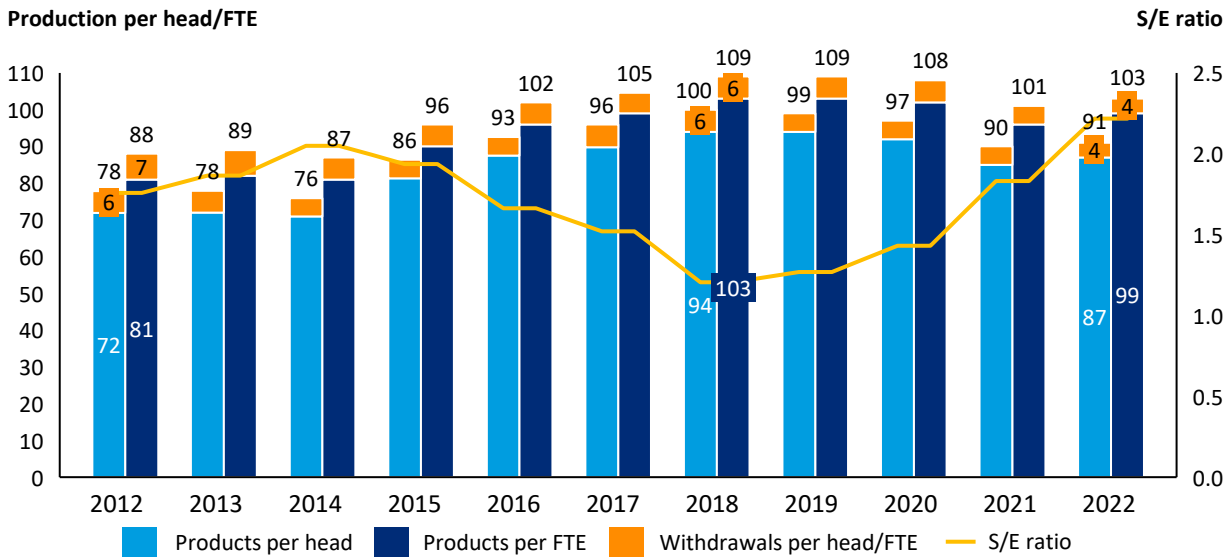
Externally, the impact of the Covid-19 pandemic impacted the EPO productivity. Internally, four key factors contributed to the EPO productivity developments: first, an increase in the S/E ratio of about 83% (Figure 8), as the incoming Search workload was higher than planned and the EPO continued to prioritise timeliness of Searches; second, an increase in time per Examination; third, a decrease in the core time per examiner related to an increase in time invested in core and non-core investments (aside from SEO production), in addition to sick leave; and fourth, a decrease in withdrawals from 24k in 2018 to 14k in 2022.

¹⁰ This reduction represents the effect of fewer examiners on total production relative to 2018 levels

¹¹ This reduction reflects the impact of decreased output per examiner on total production compared to 2018 levels

¹² OECD productivity statistics

Figure 8: Average productivity, Products per head (average headcount), products per FTE and S/E ratio, 2012-2022



Examiner efficiency, indicated by time per product, varied between Searches and Examinations, and both converged to 1.76 days per product in 2022 (Figure 9). The time required for Searches decreased from 1.93 to 1.76 days per Search. At the same time, the time required for Examinations increased from 1.55 to 1.76 days per Examination, partly due to changes in performance management and partly to the introduction of a revised voting process to handle a proposal for grant within the examining divisions¹³.

¹³ The EPO records only days per (SEO) product and days per Search and Examination. The split of days per Search and days per Examination is estimated by a statistical model. The 95% confidence interval is in the order of ±1% for Search and ±3% for Examination

As the execution of Searches requires more time than the execution of Examinations, a higher S/E ratio will ceteris paribus (i.e., assuming constant time per Search and Examination) result in 1) a decrease in total products produced and, hence, 2) a decrease in PPH and an increase in time per product

As Examinations can take years to complete, efficiency gains will be reported with a lag

Note: The sums of individual figures might be different from the totals due to rounding

Figure 9: Time per Search/Examination/SEO product, in days, 2012-2022

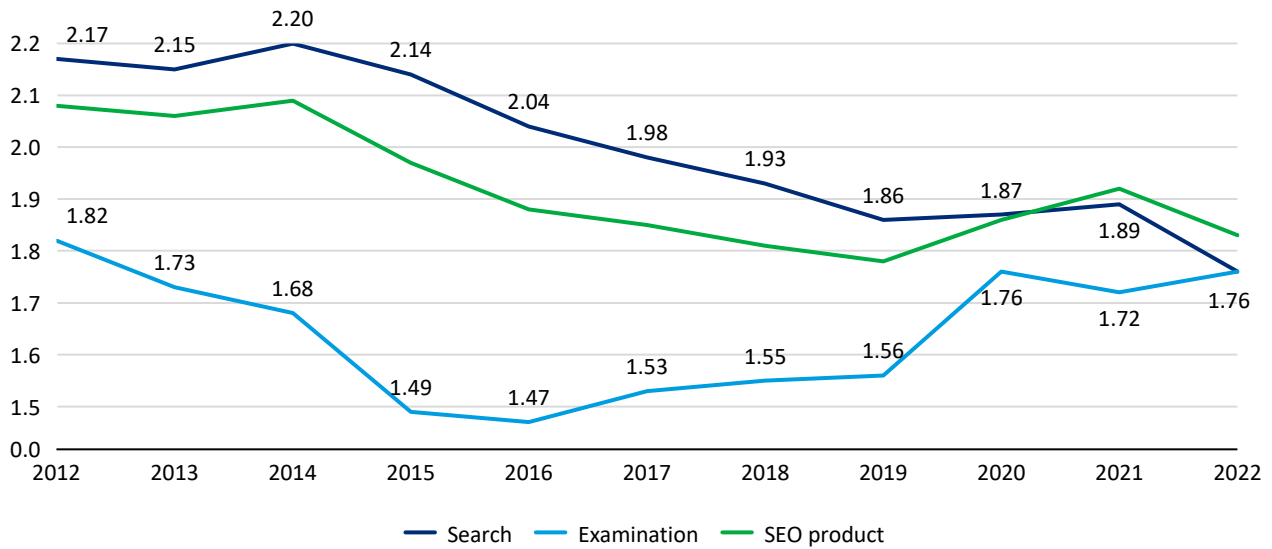
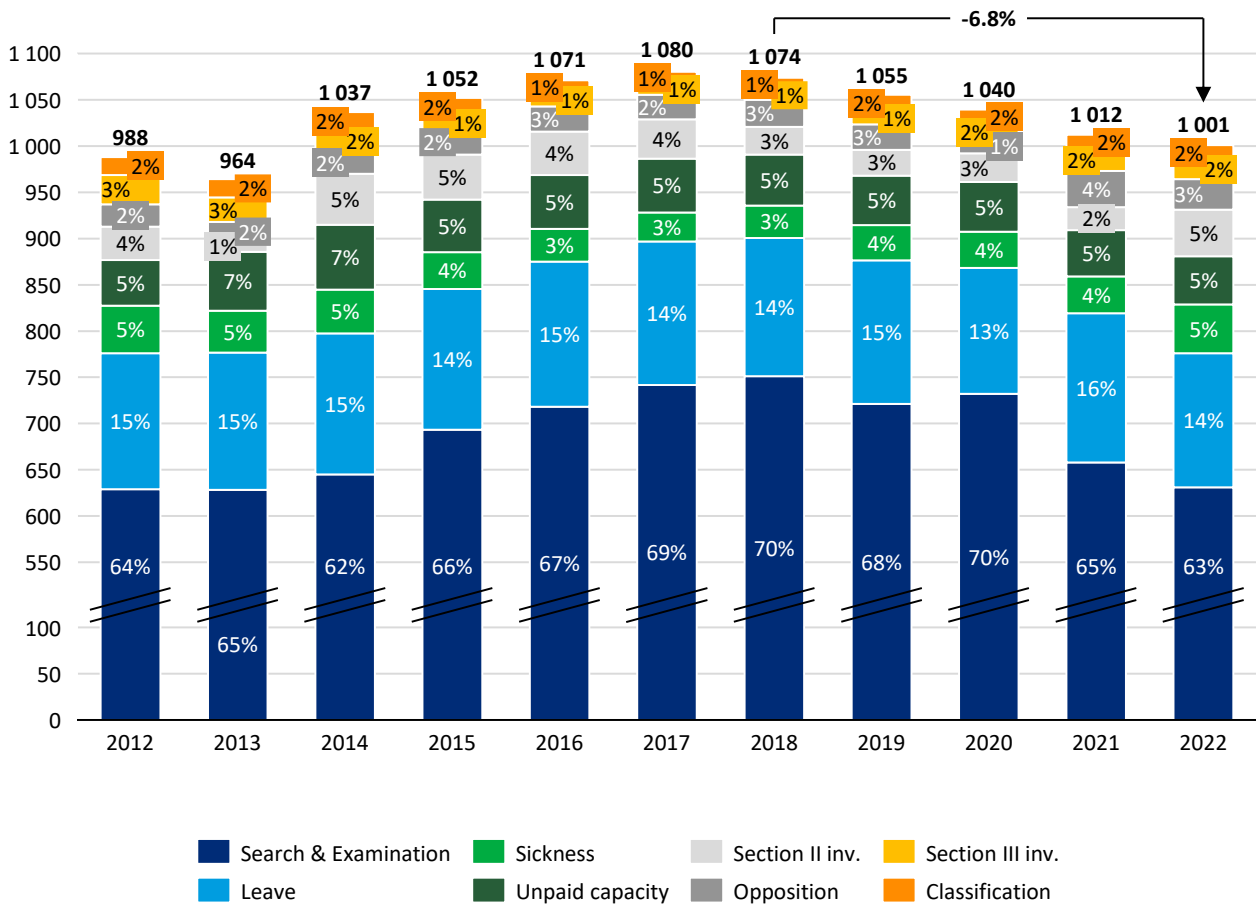


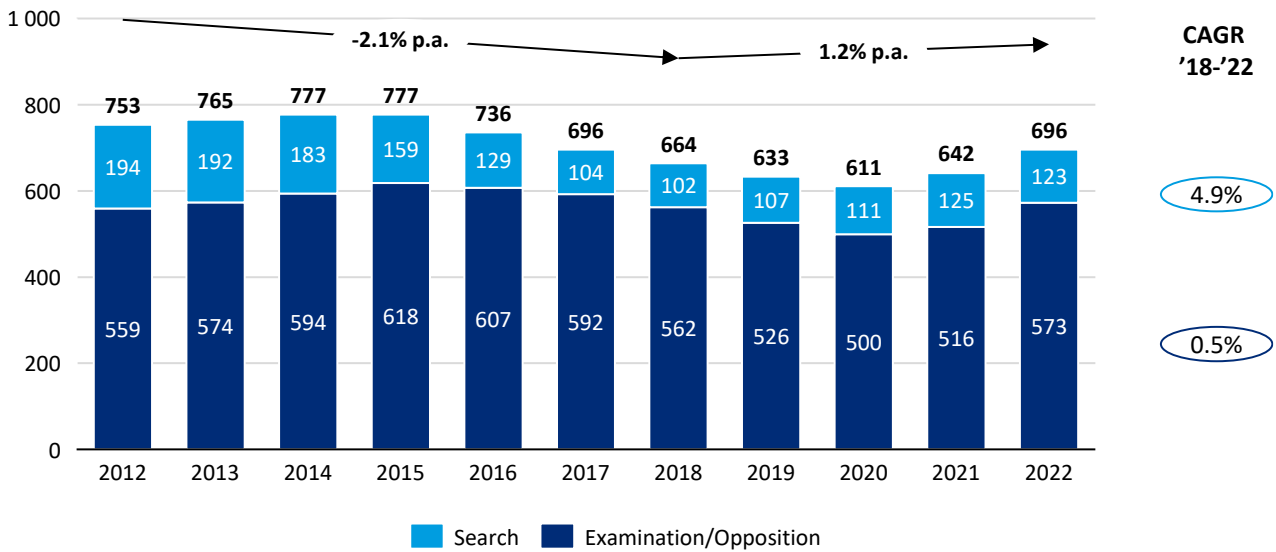
Figure 10 shows the percentage splits of total examiner gross capacity. In 2022, examiners spent 70% less time on Search than in 2018 and 63% less on Examination. This development is due to several factors: an overall decrease in examiner gross capacity by 6.8%, related to the reduction in headcount; an increase of core investments (section II investments, e.g. training or team management) from 32 days in 2018 to 50 days in 2022; an increase of non-core investments (section III investments, e.g. DG5 or BIT support, or strategic programmes) from 11 days in 2018 to 20 days in 2022; and an increase in classification time by 12.3%. The decrease in the proportion of time spent on Search and Examination is also attributable to an overall increase in sickness: the averages increased from 8.2 days per examiner in 2018 to 13.3 days in 2022.

Figure 10: Split of examiner gross capacity, in k days, 2012-2022



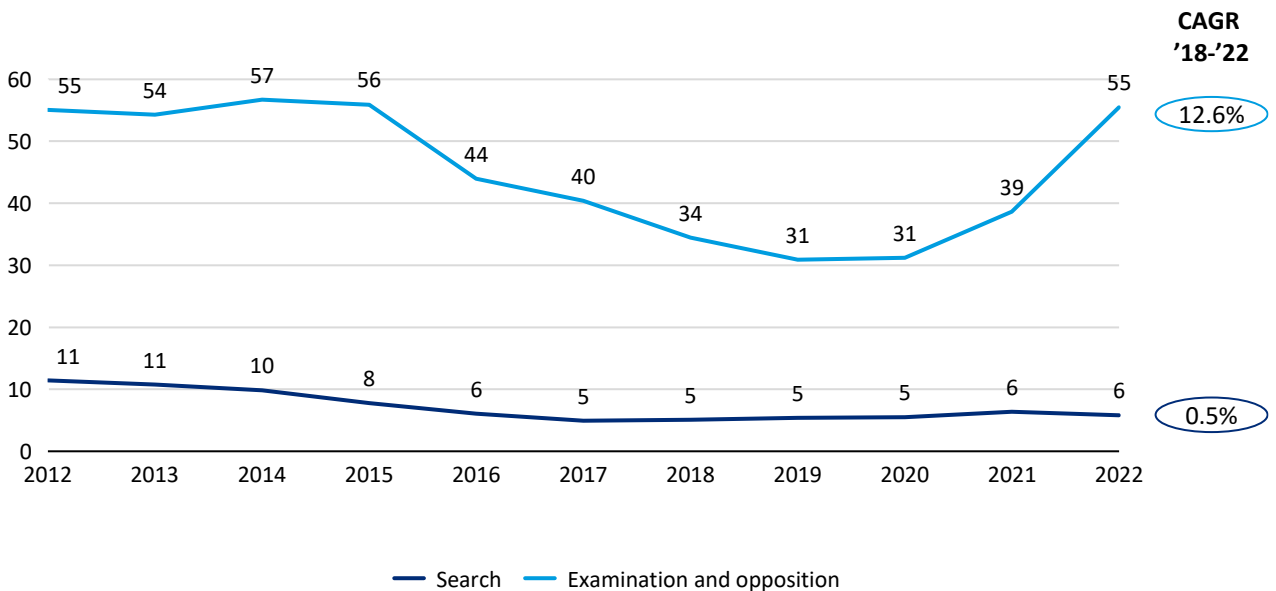
Challenging developments in production and an unanticipated increase in incoming workload, especially during the pandemic, resulted in excess demand for the available production supply and caused a steady, 1.2% p.a., increase in SEO stock between 2018 and 2022 (Figure 11 and Figure 12). Total SEO stock decreased from 2012 to 2020 following the introduction of the Early Certainty initiative in the second half of 2014. This had the goal to conduct Searches within six months of filing and Examinations within 12 months after an Examination request. In 2020, Early Certainty was replaced with business continuity efforts during the Covid-19 pandemic. As a result, stock grew from 611k products in 2020 to 696k in 2022. But the focus is now moving back to productivity, because of the timeliness challenges that are arising.

Figure 11: SEO stock¹⁴, in #k products (cases), 2012-2022



This trend is reflected in the development of stock expressed in output-months of work¹⁵. These were lowest in 2019 and 2020, with five months of stock for Searches and 31 months of stock for Examinations and Oppositions. They then increased to six months of stock for Searches and 55 months of stock for Examinations and Oppositions in 2022 (Figure 12). This trend suggests that stock levels will rise further.

Figure 12: Timeliness (approximated by SEO stock expressed in output-months of work^{16,17}), cases pending EOP, 2012-2022



¹⁴ Medium Term Business Plan (MTBP) case view

¹⁵ End of year stock in cases divided by production in cases of that year

¹⁶ Assuming priority for Search completion within six months and first-in first-out prioritisation of Examination production

¹⁷ Output months of work are an indicator of how many months it would take to work through the remaining pending cases, assuming no further incoming workload

2.3. Financial situation

The assessment is based on audited financial statements (IFRS pure). The EPO uses two accounting standards: IFRS pure and IFRS standardised. The IFRS standardised view¹⁸ is also shown for comparison, where applicable.

2.3.1. Revenue

The EPO's financials have been volatile due to macroeconomic changes. Revenue of the EPO comes from three main sources:

- Procedural fees (without internal renewal fees)
- Internal renewal fees
- National renewal fees

Revenue from procedural fees results from fees paid in relation to certain steps of the PGP, such as filing, Search, Examination, Opposition, grant and appeal. The fees are defined by the EPO and paid in advance of each process step, and the applicant can withdraw the application at any stage of the PGP. The filing marks the beginning of the PGP. An applicant files an application, for example via post, fax, e-mail, or available electronic masks. The applicant then pays the fees for filing and Search.

The Search begins after formalities have been checked. In the Search step, the examiner assesses the novelty of the invention and its innovative character, as well as all available material that potentially raises questions over the application's novelty. Subsequently, a Search report is prepared, in which all relevant material found during the Search is listed and classified. Finally, a written opinion is prepared, in which the examiner outlines the result of the Search and provides a preliminary opinion on the invention's patentability. The first publication follows, which is the publication of the application as originally filed and the Search report 18 months after filing.

After having received the Search report, the applicant decides whether to proceed with the substantive Examination and pays the Examination fee. The examiner assesses the application's novelty, inventive character, industrial applicability and patentability, decides whether to grant or refuse the application, and then summarises the findings and decision in an Examination report. During the process the applicant is informed of the state of the application, e.g., if there is an intention to grant the patent or to refuse it. If the process up to the actual grant of the patent exceeds two years from the date of filing, the applicant begins to pay annual internal renewal fees (IRF) at the beginning of the third year after filing.

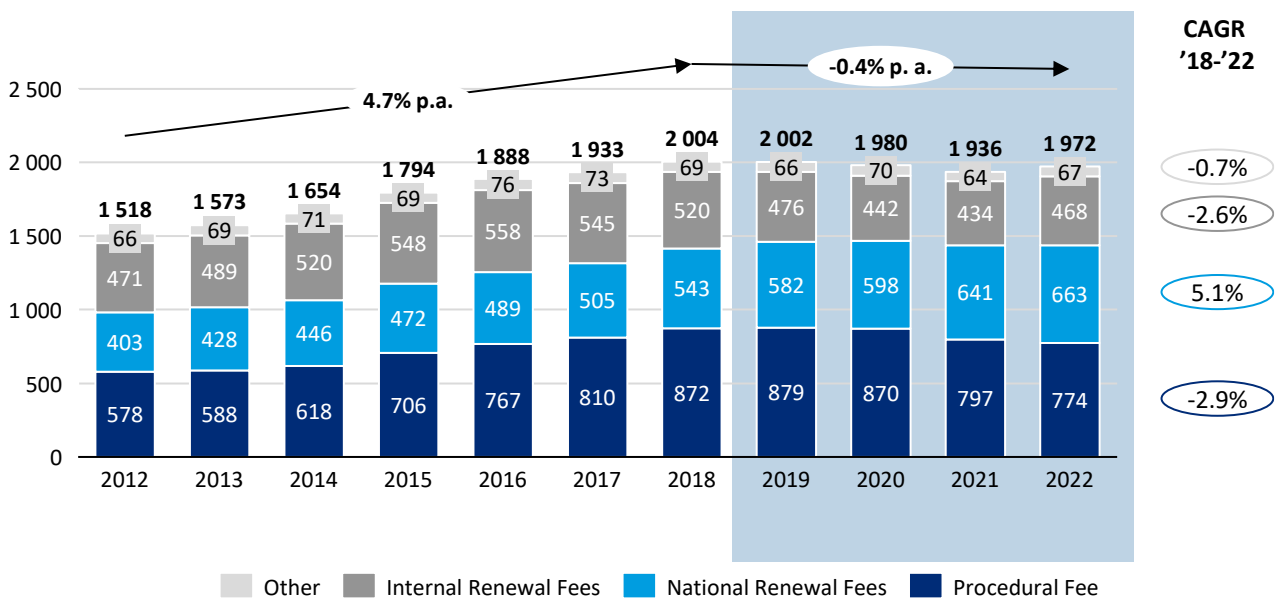
IRF are paid to protect a pending application until the patent has been granted, refused or withdrawn. IRF are paid annually from the beginning of the third year after an application has been filed until the end of the Opposition period. The EPO defines the amount of the IRF in each ordinal year (i.e., the age of an application since its date of filing).

National renewal fees (NRF) are paid to protect a granted patent in the states where the applicant seeks protection. They are paid annually from the end of the Opposition period until the applicant decides to stop the patent protection. Individual member states define the value of the NRF for each year of protection after the grant. The fees are currently split 50:50 between the member states and the EPO. The key drivers of NRF are the number of patents granted, the patents' lifetimes and the number of states in which the patents are protected.

¹⁸ IFRS pure corresponds to the audited IFRS financial statements where a discount rate derived from AA-Bond is applied, while IFRS standardised corresponds to a standardised discount rate used to steer the organisation

Taking the revenue from procedural fees, IRF and NRF together gives the total revenue of the EPO. Total revenues peaked in 2018 at EUR 2 004 million (mn) after which they stagnated at around EUR 1 950 mn from 2020 to 2022 (Figure 13). The peak was largely driven by the EPO’s push for productivity and production from before 2019. From 2018 to 2020 revenue development was mainly driven by a decrease in production, which led to a decline in revenues from procedural fees. Overall revenues decreased at 0.4% p.a. from 2018 to 2022. NRF increased at 5.1% p.a., after a strong increase in patent grants prior to 2019, which increased the number of NRF cases. Procedural fees decreased at 2.9% p.a., because of a decrease in SEO production, which was compensated for by an inflation-related fee increase of 3% in 2022. IRF decreased at 2.6% p.a. from 2018 to 2022.

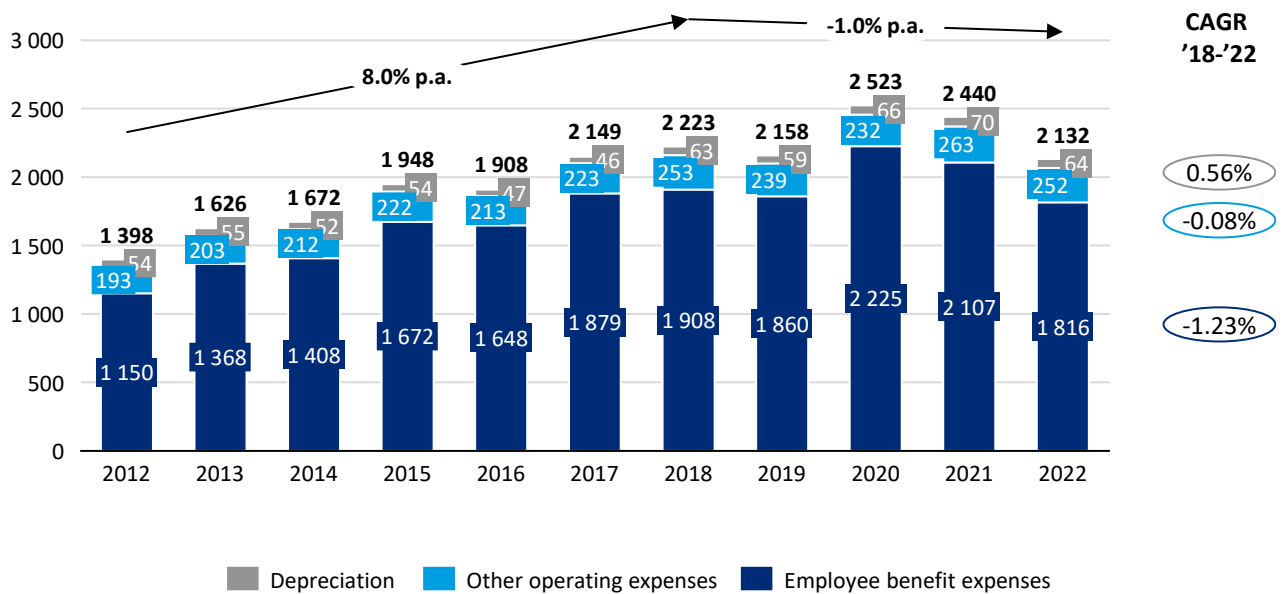
Figure 13: Total revenues, in EUR mn, by revenue type, 2012-2022



2.3.2. Expenses

Total operating expenses decreased at 1.0% p.a. between 2018 and 2022 (Figure 14). Due to the knowledge-driven nature of PGP activities, employee benefit expenses make up by far the largest part of operating expenses (between 78% and 88%). Mainly because of changes in the IFRS discount rate, employee benefit expenses increased steeply between 2019 and 2020. As a result, operating expenses rose to EUR 2 523 mn in 2020, but they levelled off to EUR 2 132 mn in 2022.

Figure 14: Total operating expenses, in EUR mn, IFRS pure, by expense type, 2012-2022



Employee benefit expenses declined slightly from 2018 to 2022, at 1.2% p.a., mostly due to changes in the IFRS discount rate, which is outside the EPO’s control. This decline led to volatility in social security costs including the past service cost, which can be seen in Figure 15. Basic salaries increased at 0.3% p.a., as four factors largely compensated for each other: 1) a decrease in the workforce of 500 employees¹⁹, including a substantial share of retirees; 2) career progression of the workforce; 3) salary scale increases of about 2.9% in July 2019 and June 2020²⁰ and about 0.5% in 2021²¹ – but 0% in 2022 due to the triggering of the exception clause in 2022²²; and 4) the financially positive effect of replacing staff at the higher ends of their careers with newcomers at the starts of their careers. Overall, YoY increases in salary were limited due to the introduction of the new salary adjustment method related to measures approved in CA/18/20 (see Chapter 3).

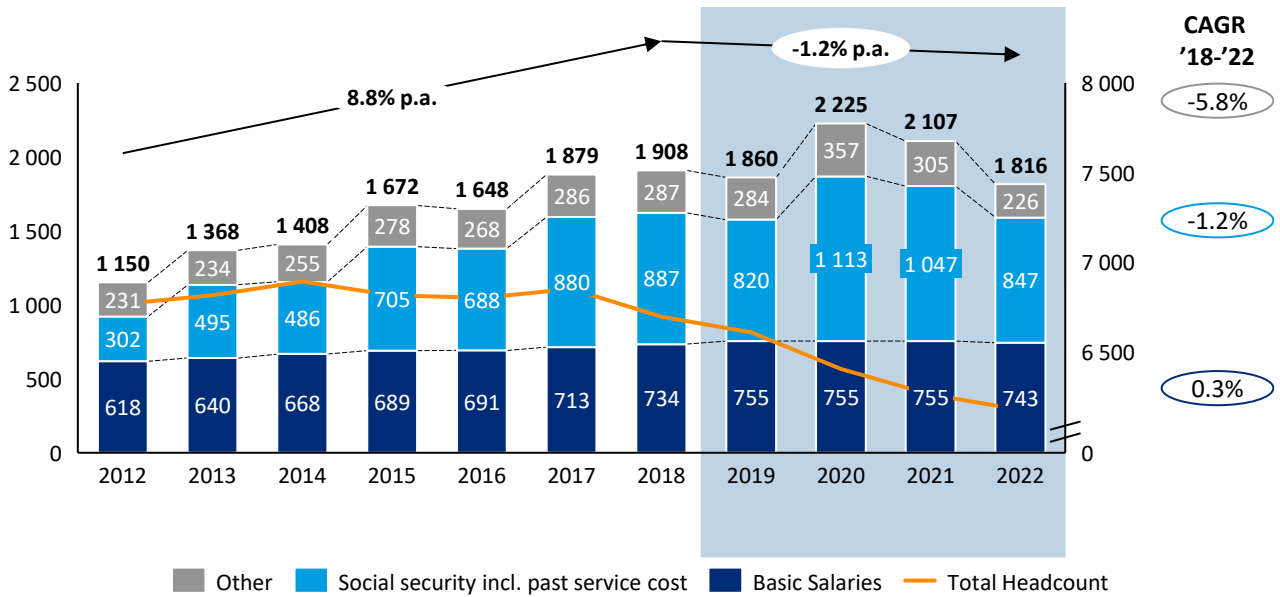
¹⁹ Excluding Young Professionals (125 in 2022)

²⁰ CA/93/19: Change between the old salary adjustment mechanism, where salaries were adjusted each year in July, to a new salary adjustment mechanism, with adjustments taking place each January

²¹ CA/66/20

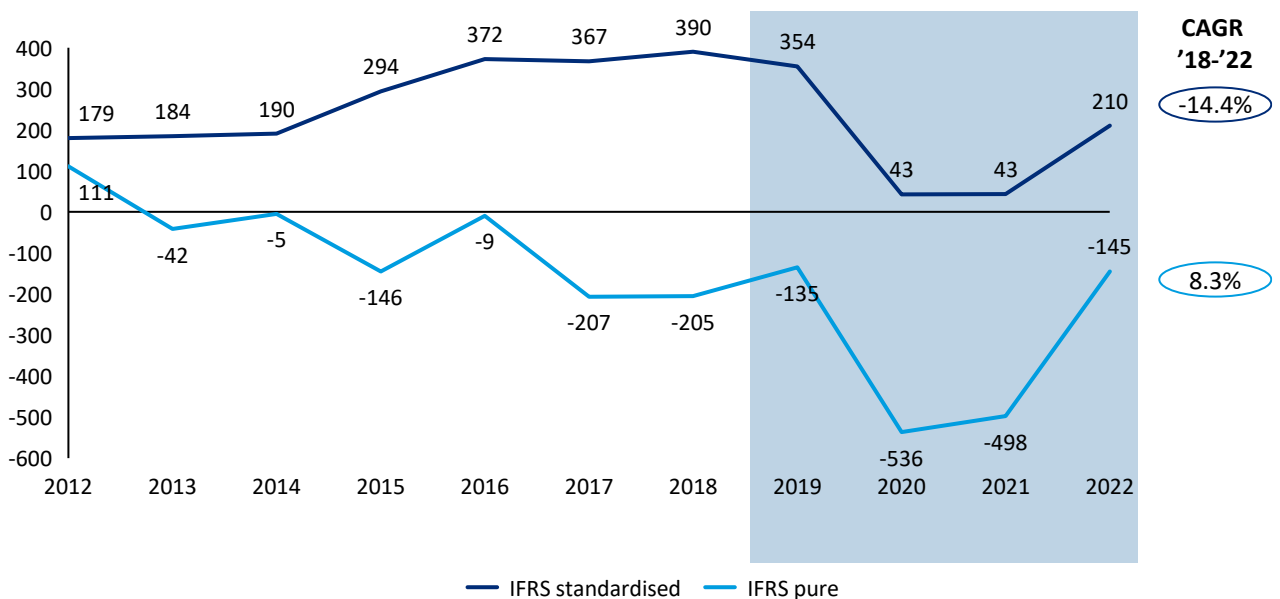
²² Exception clause: In the case of negative GDP growth (below -3%), salary adjustments are initially not applied. They are only adjusted when GDP growth recovers above the level that triggered the application of the exception clause

Figure 15: Employee benefit expenses and total headcount, in EUR mn/#, IFRS pure, by employee benefit expense type, 2012-2022



The IFRS operating result (Figure 16) is composed of total revenues and total operating expenses. As the discount rate has a significant impact on the operating result through the current service cost (CSC), the EPO applies a constant discount rate internally to obtain a standardised operating result. This makes the operating result comparable from year to year, as the effect of a changing discount rate is eliminated by applying a constant discount rate. Thus, the operating result under IFRS pure is more volatile, as it is exposed to annual changes in the discount rate. But the discount rate for IFRS standardised is kept constant for several years (the most recent change was in 2020). Under IFRS pure, the operating result reached a 10-year low of EUR -536 mn in 2020 and subsequently improved to EUR -145 mn in 2022, primarily because of the IFRS discount rate.

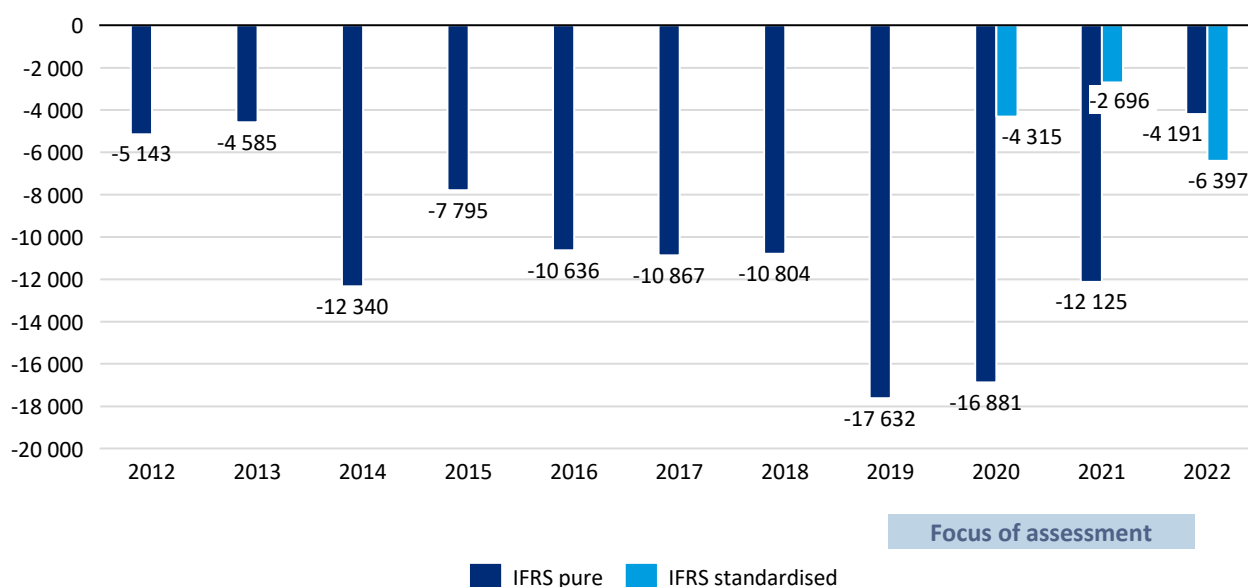
Figure 16: Operating result, in EUR mn, 2012-2022



2.3.3. Equity

Total equity primarily reflects the development of defined benefit obligations (DBO) and reserve funds for pensions and social security (RFPSS) assets as well as of the EPOTIF. Under IFRS pure, equity increased from EUR -10 804 mn in 2018 to EUR -4 191 mn in 2022 due to a near quadrupling of interest rates in the period, which affected DBO (indirectly via the discount rate) and the market valuation of RFPSS assets and the EPOTIF (Figure 17). Due to a stable discount rate, the equity for IFRS standardised is less influenced by capital market volatility and ranged between EUR -4 315 mn in 2020 and EUR -6 397 mn in 2022. The increase from 2020 to 2021 was driven by an increase in the values of both RFPSS assets and the EPOTIF. The decrease from 2021 to 2022 is due to market losses resulting in a decline in the values of RFPSS assets and the EPOTIF. A new salary adjustment method was introduced, which caused a change in the underlying actuarial assumptions, from a salary increase of 0.5 percentage points (pp) above inflation to one of 0.2 pp above inflation. This change had an immediate effect on DBO from 2020 for both IFRS pure and IFRS standardised.

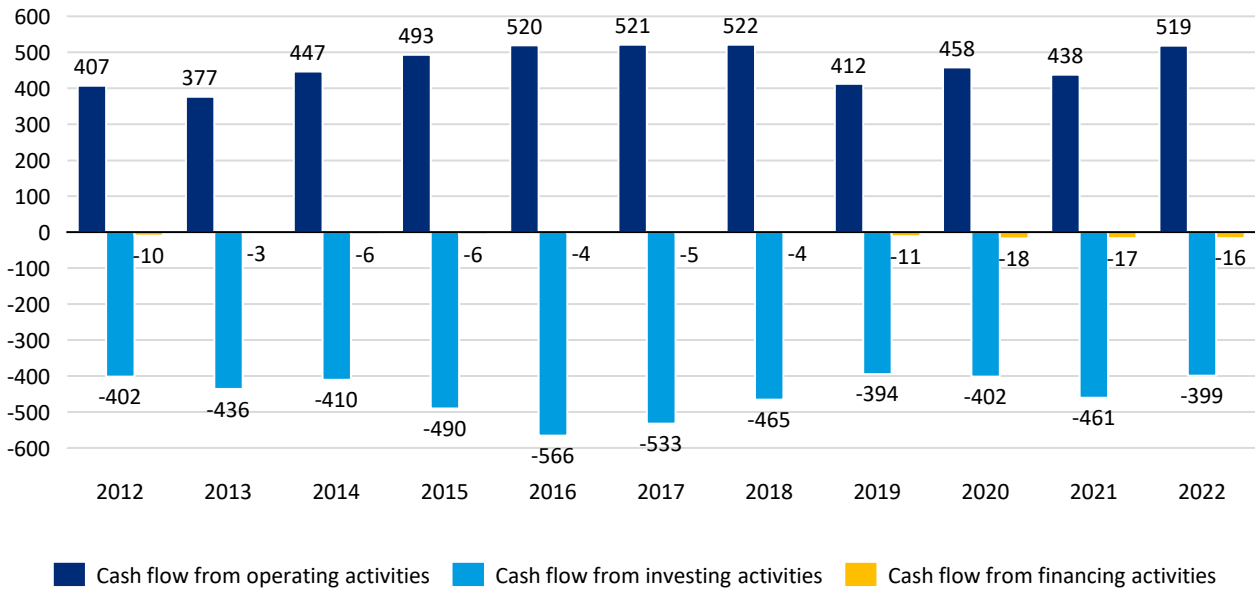
Figure 17: Equity, in EUR mn, 2012-2022



2.3.4. Cashflow

Cashflow from operating activities in 2022 was back to pre-Covid-19 pandemic levels at EUR 519 mn (Figure 18). Operating cashflow increased constantly until 2018, when it dropped from EUR 522 mn in 2018 to EUR 412 mn in 2019. But it bounced back to EUR 519 mn in 2022. This trend reflects the revenues from fees between 2018 and 2022, which was driven by a combination of factors: an increase in revenue from NRF due to increased patent grants before 2019; a decline in revenue from procedural fees due to a decrease in SEO production; and a decline in IRF corresponding to changes in stock. However, there is generally some degree of time lag before an impact on cash in-flows. Cashflow from investing activities fluctuated and remained negative in the period under consideration. This was primarily driven by statutory contributions to the RFPSS, as well as voluntary contributions to the RFPSS and the EPOTIF related to measures approved in CA/18/20 (see Chapter 3). The cashflow from financing activities comes from interest payments and repayments of lease liabilities.

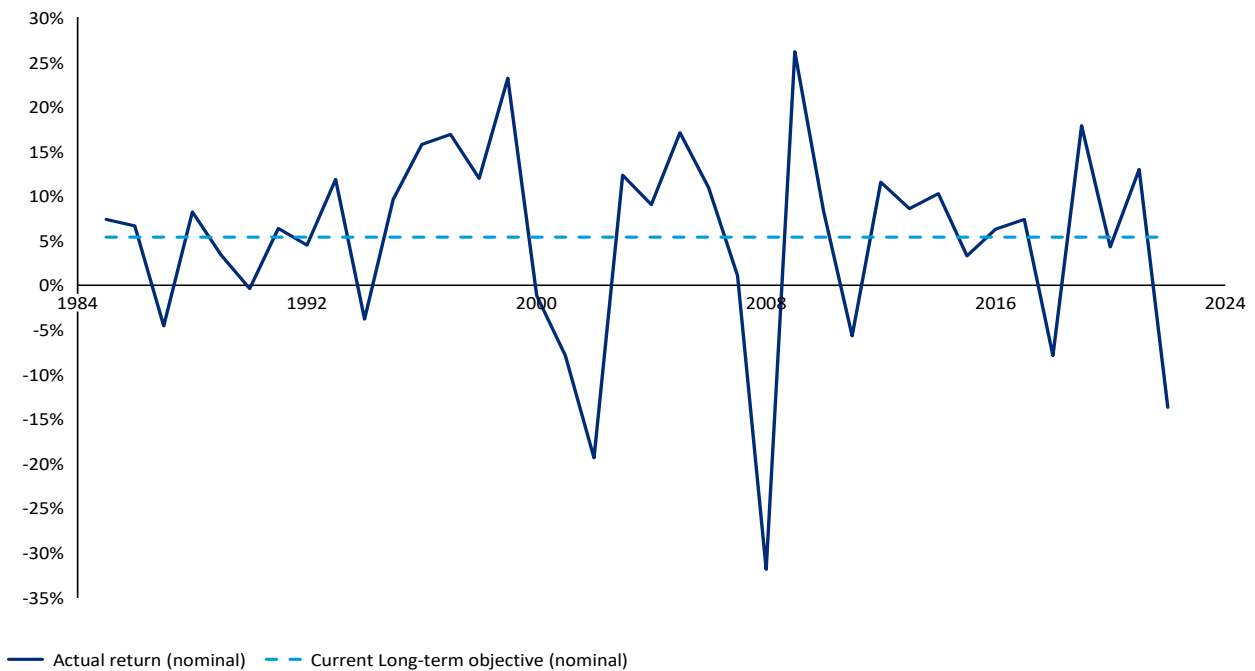
Figure 18: Operational, investing and financing cash flows, in EUR mn, 2012-2022



2.3.5. RFPSS and long-term employee-benefits

Since 1992 the real return expectation on RFPSS assets was changing between 3.0% and 3.75% (real), which over the long term was mostly exceeded by the performance of the RFPSS (Figure 19). However, in the last five years, the performance of the RFPSS assets has lagged the objective. The market downturn in 2018, followed by an unsatisfactory overall market performance in 2022, is reflected in the year-on-year performance of the RFPSS. This development is due to the evolution of the market, which has become complex over the past year due to geopolitical strife, inflation worries and restricted central bank policies.

Figure 19: Return on RFPSS assets, in % year-on-year (YoY) growth, nominal, 1984-2022



From an IFRS perspective, the funding gap has increased over time due to the DBO’s sensitivity to the discount rate, which in turn is also related to inflation. Figure 20 contrasts the development of DBO to the RFPSS and the EPOTIF. DBO went up from EUR 20.8 mn to EUR 30.0 mn in 2020 but then decreased by 42% in 2022, while RFPSS net assets grew constantly until 2021, when they reached EUR 11.9 mn, before decreasing slightly to EUR 10.4 mn in 2022. The EPOTIF grew in line with the RFPSS, from EUR 2.5 billion (bn) in 2018 to EUR 3.6 bn in 2021, before it decreased in 2022 to EUR 3.2 bn. The total DBO also include unfunded benefits (i.e., tax adjustments, family allowances and death). These need to be covered by operating cashflow or by the EPOTIF, which was introduced in 2018 as a liquidity reserve fund.

Figure 20: DBO International Accounting Standards (IAS 19) and RFPSS assets, in EUR mn, 2012-2022

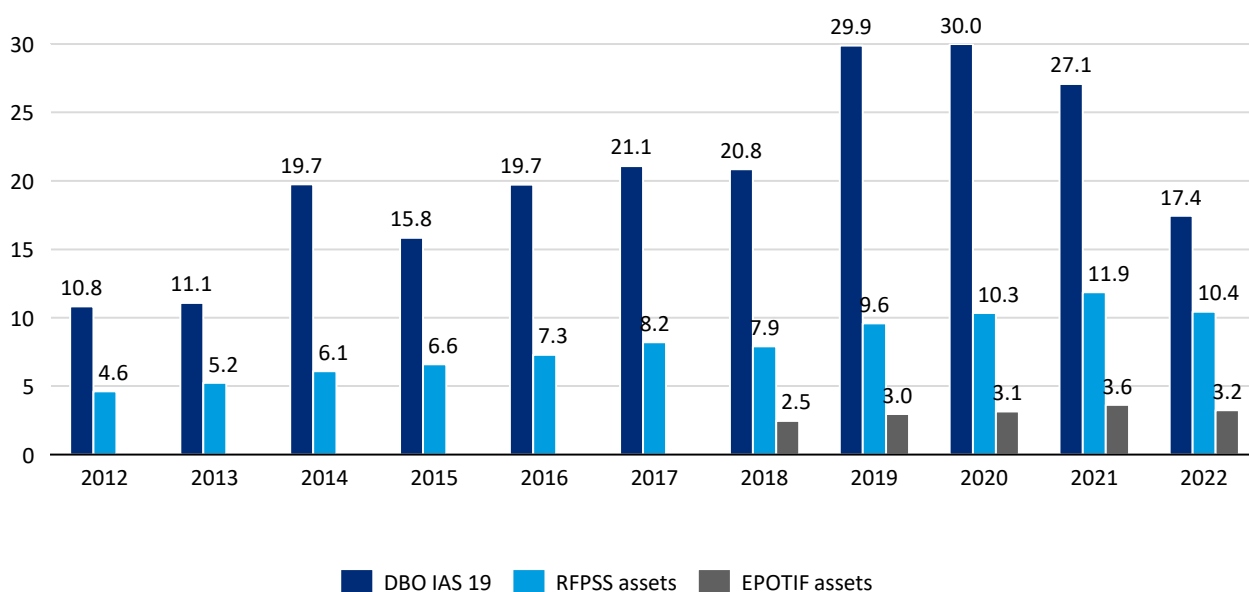
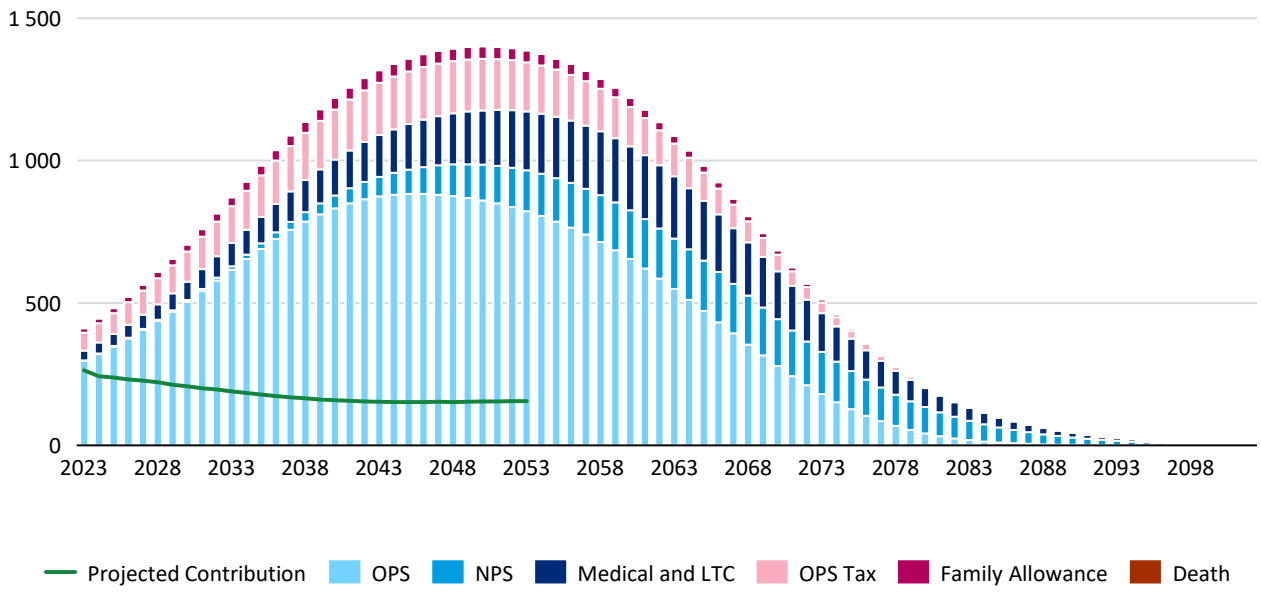


Figure 20 shows the present value of the obligation under IFRS standards diminished to EUR 17.4 bn in 2022, a multi-year low. This reduction is primarily attributable to the environment of high inflation and elevated interest rates, which led to the application of a higher discount rate – which in turn resulted in a lower DBO level. The majority of employees currently in service are projected to retire within the next 20 years. (Figure 21). Consequently, the service cost is expected to reduce gradually. This is partly offset by increasing contributions to the salary savings plan (SSP). The old pension scheme (OPS) and its tax allowances are currently representing the predominant cash outflows in the projections. However, the new pension scheme (NPS) will gradually supplant this time.

Figure 21: Projected total cash flow current population (actives and non-actives), in EUR mn, 2023-2102



3. Financial measures assessment

3.1. Measures implemented with CA/18/20

Following the Financial Study 2019 and the coverage gap²³ it projected, the EPO has introduced a bundle of measures to improve the EPO's long-term financial sustainability and reduce this gap. The Administrative Council approved six financial measures in 2020 (CA/18/20) to improve the EPO's long-term financial sustainability. These were implemented between 2020 and 2022. Oliver Wyman and Mercer have been tasked to assess the impacts of the six measures, details of which are given below.

Measure ²⁴	Details
1 Adjust the method for collective salary adjustments	A new salary adjustment method (SAM) was adopted by the Administrative Council in June 2020 and went into full effect on 1 January 2021 (CA/D 4/20). This method affects the EPO's staff (active and pensioners) as the new SAM limits salary growth in the long term to 0.2 pp above euro-zone inflation. A sustainability clause replaces the moderation clause previously applied. In addition, the method introduces a redistribution pool and a periodic settlement clause affecting employee benefit payments in the short term ²⁵ .
2 Increase pension contributions to RFPSS by 3.3%	Total contribution rates for pensions are recommended by the Actuarial Advisory Group (AAG) and defined as a percentage of basic salary. The EPO contributes two-thirds and employees one-third. Pension contributions to the RFPSS were increased by 3.3 pp, from 29.4% in 2019 to 32.7% in 2020.
3 Increase procedural fees	The Administrative Council approved the continuation of biennial inflation-related fee adjustments in June 2020 (following CA/18/20). On 1 April 2022, an adjustment of 3% in procedural fees was implemented (CA/61/21) ²⁶ . The inflation-related fee increase is related to the Harmonised Index of Consumer Prices (HICP), which rose by approximately 3% from 2019 to 2021 (CA/61/21).
4 Digitise the Patent Granting Process end-to-end	Under Goal two of the Strategic Plan 2023, a large variety of IT programs and projects have been developed to digitise the PGP. The measure was assessed considering all those activities since 31 March 2020. In line with the expected increase in productivity (by improving tool functionalities and interoperability between tools and by reducing repetitive or less cognitively demanding tasks), recruitment activities have been reduced or even discontinued. The savings in salaries and benefits are considered an impact of the measure.
5 Invest 60% of annual cash surplus in EPOTIF	This measure has been enforced from 2020: Since then, the EPO has targeted a transfer of 60% of its annual cash surplus into the EPOTIF.
6 Invest 40% of annual cash surplus one-off in RFPSS	The EPO targets an investment of 40% of its annual cash surplus one-off in the RFPSS. The first transfer from the EPO's treasury to the RFPSS that is attributable to the measure was decided in October 2020 (CA/56/20).

²³ Difference between funding requirement and available cash surplus projected for 2038 (CA/83/19)

²⁴ The measures are numbered in the order in which they are listed in CA/18/20

²⁵ Not included in the valuation, because the impact over the observed period was limited as salary increases offset each other, leaving the redistribution pool empty as of 31 December 2022

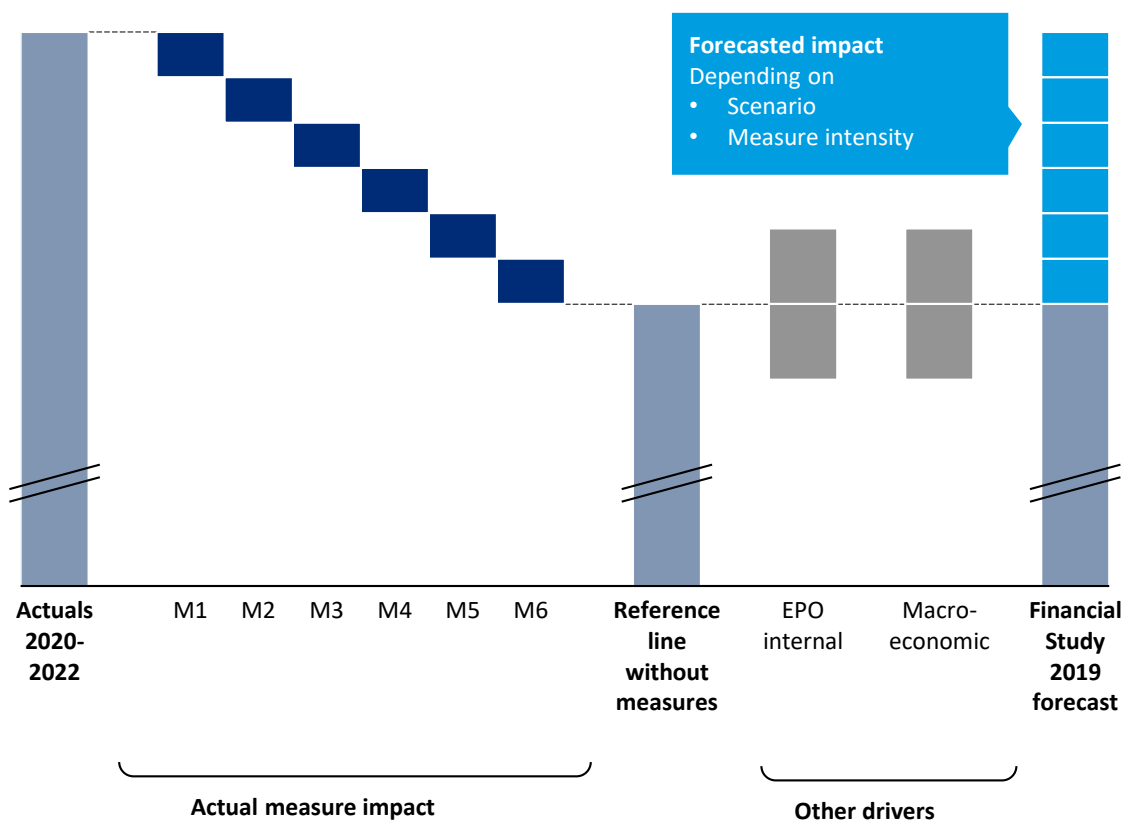
²⁶ Before the increase in 2022, the last inflation-based fee increase took place in 2020. This was before the approval of the measure in June 2020 and is therefore not considered in the assessment of measures (CA/D 12/19)

3.2. Applied methodology

The financial assessment takes a backward-looking approach that focuses on financial impacts of the measures that materialised between 1 January 2020 and 31 December 2022. A simulated reference line without measures is compared to actuals in the 2020-2022 period (Figure 22). By doing this, no assumptions are made about future developments (e.g., capital market movements) or the EPO’s future policies. Also, no projections of future impact are made – for example, the future benefits of not hiring an examiner today (such as savings related to lifetime cost) are not considered. The impact of a measure is the difference between the actuals and the reference line.

No explicit modelling of diversification effects or interdependencies between measures (i.e., the mutual impact of measures on each other) was made, as they were negligible during the 2020-2022 period.

Figure 22: Methodology for measure impact assessment²⁷



The assessment is based on audited IFRS financial statements (IFRS pure). The IFRS standardised view is approximated for comparability. The only difference in the results is due to the different discount rate used. This affects DBO, thus influencing equity, and the CSC, influencing the operating result.

3.3. Financial impact assessment

While the benefits of measures approved in CA/18/20 are largely expected to materialise over the long term, they have already yielded an initial improvement in the EPO’s finances. This financial assessment evaluates the progress made, so that potential adjustments can be considered.

²⁷Deviations from the impact forecasted in the Financial Study 2019 are largely due to unexpected macroeconomic developments (shown as “Macroeconomic”) and implementation that deviated from specifications for the measure (shown as “EPO internal”).

Figure 23 (IFRS pure) and Figure 24 (IFRS standardised) show the impact for each measure, as well as the aggregated impact of all measures. The overall benefit to equity was around EUR 1.1 bn (IFRS pure)²⁸, which was largely due to a reduction in DBO triggered by the new SAM. The overall benefit of the measures to the operating result was about EUR 574mn (IFRS pure)²⁹. Digitisation investments and the impact of the new SAM largely compensate each other, resulting in a total benefit of circa EUR 84 mn in the operating cash flow that is attributable to the measures taken. Investment in the EPOTIF and the RFPSS during the observed period corresponded to about EUR 870 mn additional cash invested³⁰.

The benefits of the measures are in line with expectations from the Financial Study 2019. Deviations from the impacts forecasted in the Financial Study 2019³¹ are largely due to unexpected macroeconomic developments and to differences between the implementation and the measure specifications. The Financial Study 2019 specified implementation intensities for each measure that were either “low”, “medium” or “high” (see Figure 23 and Figure 24).

²⁸ About EUR 1.2 bn under IFRS standardised

²⁹ About EUR 337 mn under IFRS standardised


³⁰ The sum of statutory and voluntary investments in the RFPSS and voluntary investments in the EPOTIF resulting from measures 2, 5 and 6, compared to no investments in addition to the statutory contributions

³¹ As in CA/18/20

Figure 23: Impact assessment (IFRS pure)

Measure (implemented intensity)	Operating result (EUR mn, 2020-2022 cumulative)	Operating cash flow (EUR mn, 2020-2022 cumulative)	Equity (EUR mn, as of 2022)
1 Adjust the method for collective salary adjustments ¹ (low)	402 81	98 12	1 020 677 ²
2 Increase pension contributions to RFPSS by 3.3% (low) ³	29 29	0 0	30 20
3 Increase procedural fees (medium)	25 3	25 7	25 3
4 Digitise the Patent Granting Process end-to-end ⁴	118 -82	-39 -56	87 -81
5 Invest 60% of annual cash surplus in EPOTIF (high)	0 0	0 0	-37 59
6 Invest 40% of annual cash surplus one-off in RFPSS (medium)	0 0	0 0	-23 41
Total impact (no interdependencies between measures assumed)	574 31	84 -37	1 102 719

 **Actual impact:** Delta between actuals and reference line without measure

 **Forecasted impact:** Financial Study 2019 (base II scenario, variable discount rate)⁵

¹ For the Financial Study 2019, forecasted impact is based on reduced salary increase and implication on pension indexation

² Projected impact lower than actuals, as inflation was higher than anticipated in the base 2 scenario and different accounting standards were used

³ The forecasted impact of the Financial Study 2019 expected a positive impact of EUR 51 mn for three years in the operating cash flow which should have been shown within the financing cash flow as the impact is related to the 2/3 office contributions

⁴ Intensities were not specified; Pension related impact due to workforce reduction is not accounted for in operating cash flow

⁵ As per Financial Study 2019 Phase 2; due to different accounting standards, projections of the Financial Study 2019 are not directly comparable to any assessment based on today's financial statements; The comparison on this page should be considered as a directional indication only

Note: Sum of individual figures might vary from total due to the rounding

Figure 24: Impact assessment (IFRS standardised)

Measure (implemented intensity)	Operating result (EUR mn, 2020-2022 cumulative)	Operating cash flow (EUR mn, 2020-2022 cumulative)	Equity (EUR mn, as of 2022)	Coverage Ratio ¹ (%, as of 2022)
1 Adjust the method for collective salary adjustments ² (low)	217 81	98 12	1 202 677 ³	4.15
2 Increase pension contributions to RFPSS by 3.3% (low) ⁴	29 29	0 0	30 20	0.15
3 Increase procedural fees (medium)	25 3	25 7	25 3	0.13
4 Digitise the Patent Granting Process end-to-end ⁵	66 -82	-39 -56	56 -81	0.17
5 Invest 60% of annual cash surplus in EPOTIF (high)	0 0	0 0	-37 59	-0.19
6 Invest 40% of annual cash surplus one-off in RFPSS (medium)	0 0	0 0	-23 41	-0.12
Total impact (no interdependencies between measures assumed)	337 31	84 -37	1 253 719	4.29

■ **Actual impact:** Delta between actuals and reference line without measure
 ■ **Forecasted impact:** Financial Study 2019 (base II scenario, variable discount rate)⁶

¹The coverage ratio is derived from the quotient that results from dividing currently available assets (cash and cash equivalents, plus the RFPSS and EPOTIF asset values) by non-current DBO. This indicator was not calculated in the Financial Study 2019

² For the Financial Study 2019, forecasted impact is based on reduced salary increase and implication on pension indexation

³Projected impact lower than actuals, as inflation was higher than anticipated in the base 2 scenario and different accounting standards were used

⁴ The forecasted impact of the Financial Study 2019 expected a positive impact of EUR 51 mn for three years in the operating cash flow which should have been shown within the financing cash flow as the impact is related to the 2/3 office contributions

⁵Intensities were not specified. The pension-related impact of the reduction in workforce is not accounted for in operating cashflow

⁶As per Financial Study 2019 Phase II supplementary management material. Due to different accounting standards, projections of the Financial Study 2019 are not directly comparable to any assessment based on today's financial statements. The comparison on this page should be considered as a directional indication only

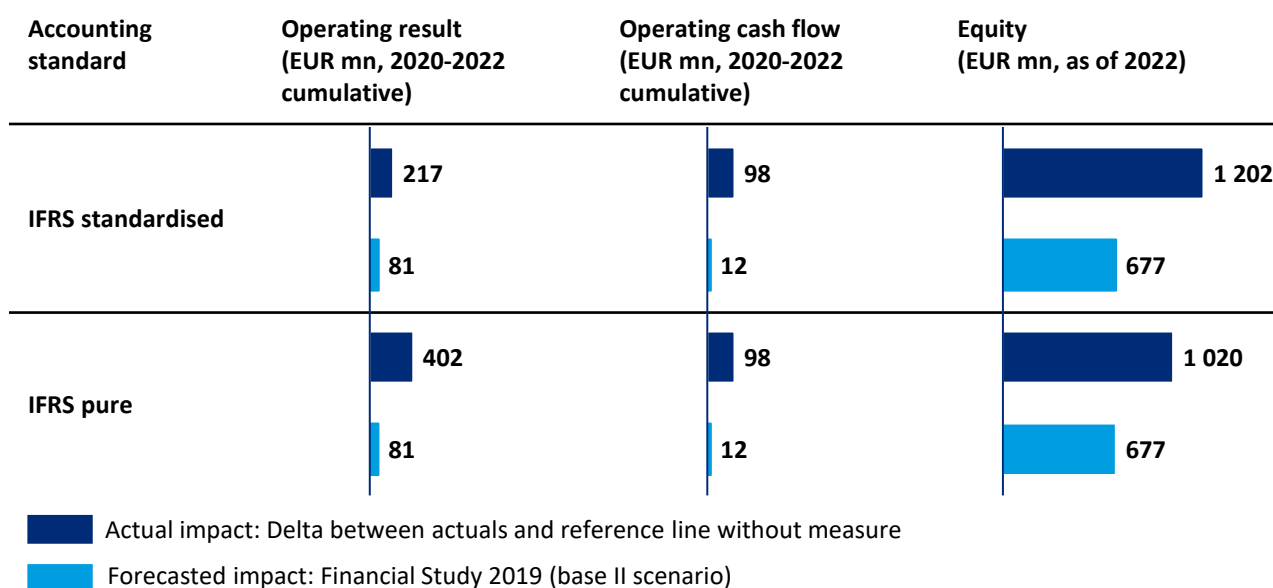
Note: The sum of individual figures might be different from the totals due to rounding

3.3.1. Measure 1: Adjust the method for collective salary adjustments

A change in the underlying actuarial assumptions, from a salary increase of 0.5 pp above euro-zone inflation to 0.2 pp above inflation, had an immediate effect on DBO in 2020 and an effect on the CSC from 2021 onwards. The change in DBO is responsible for a large part of the positive impact on equity, while the decrease in the CSC resulting from this measure contributed a positive impact to the operating result. In addition, financial figures were impacted by salary increases after the implementation of the new SAM. Salaries were increased in 2021 by 0.5% on average (CA/66/20) and remained at their 2021 levels in 2022 (CA/71/21) due to the triggering of the exception clause³⁴.

Figure 25 is showing the impact from the change in the method of salary adjustments. In the 2020-2022 period, EUR 62 mn was saved in salaries, EUR 11 mn saved in allowances, and EUR 330 mn in CSC (IFRS standardised: EUR 144 mn). The combination of these figures resulted in a total positive impact on the operating result of EUR 402mn (IFRS standardised: EUR 217 mn). The impact in equity of around EUR 1.1 bn (or EUR 1.2 bn using IFRS standardised) was mainly driven by a combination of the actuarial effect on DBO and the CSC of lower expected salary growth (inflation + 0.2 pp in the long term) in the 2020-2022 period.

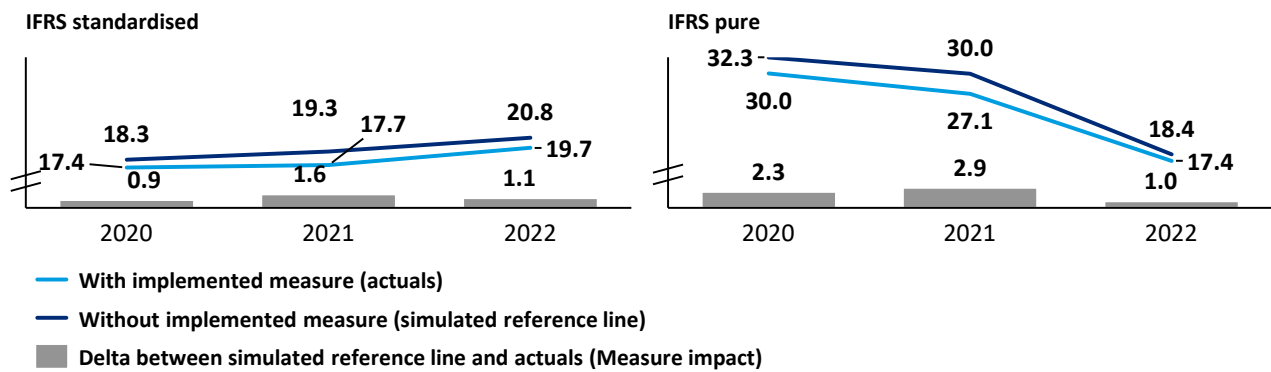
Figure 25: Financial impact from Measure 1 “Adjust the method for collective salary adjustments”



The change in actuarial assumptions was immediately reflected in the DBO in 2020 (see Figure 26). Compared to the actuals, DBO without implementing the measure exhibit a smoother trend due to more consistent assumed salary growth. However, the catch-up salary adjustment of 10.8% in 2023, when factored into DBO for 2022, results in a steeper marginal rise in DBO in 2022 and a smaller impact compared to 2021.

³⁴ Exception clause: In the case of negative GDP growth (below -3%), salary adjustments are initially not made. They are only adjusted when GDP growth recovers (to above -3%)

Figure 26: Defined benefit obligations (DBO), in EUR bn



Comparison to the forecasted impact of the Financial Study 2019 (base 2 scenario)³⁵

The Financial Study 2019 projected the impact of each measure according to whether it was implemented with low, medium or high intensity. Measure 1 was implemented with low intensity, as the newly implemented SAM caps salary increases to inflation + 0.2 pp (medium intensity would have been

³⁵ Projected impact lower than actuals, as inflation was higher than anticipated in the base 2 scenario and different accounting standards were used

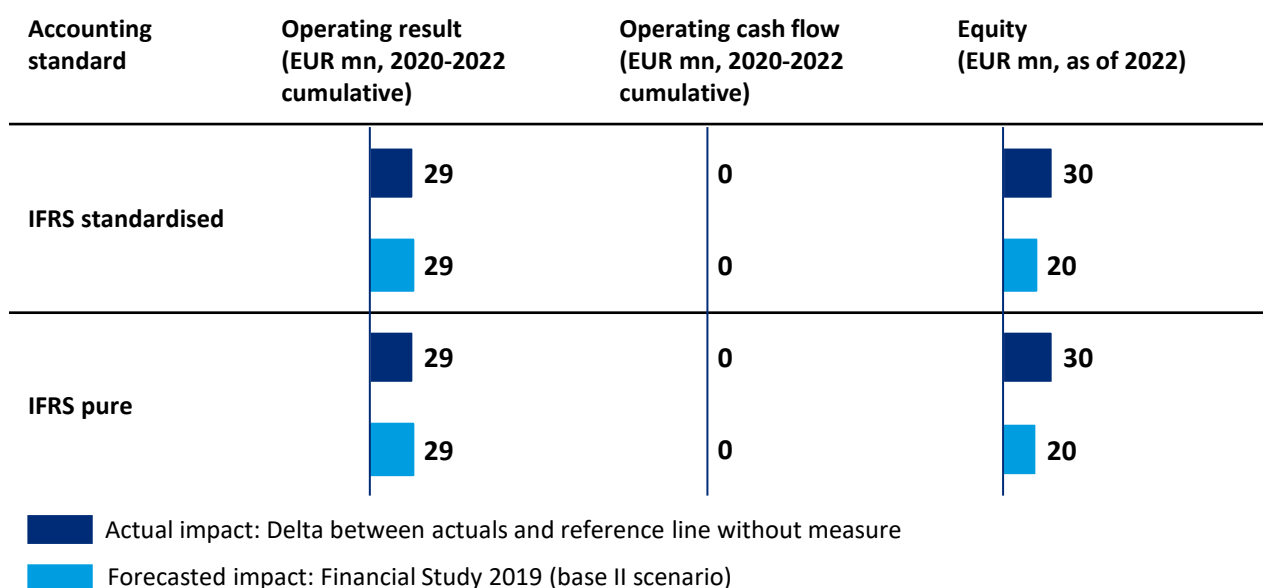
inflation + 0 pp, and high would have been inflation - 0.25 pp). A comparison of the calculated impact of the measure with the impact projected by the Financial Study 2019 shows that the impact on operating income and cashflow was higher than the Financial Study 2019 expected. That was due to short-term macroeconomic developments and resulting low salary increases until 2023, for which an adjustment was only completed in 2023 (e.g., there was a 0.5 pp increase in 2021 and no change in 2022 due to the exception clause³⁶). The impact on equity was higher than expected in the Financial Study 2019 due to a high DBO impact, which was driven by a change in actuarial parameters.

³⁶ Exception clause: In the case of negative GDP growth (below -3%), salary adjustments are initially not made and are only adjusted when GDP growth recovers (above -3%)

3.3.2. Measure 2: Increase pension contributions to RFPSS by 3.3%

The increase of pension contributions to the RFPSS by 3.3 pp to 32.7% in 2020 led to greater availability of funds and had an impact on operating results and equity in the 2020-2022 period (Figure 27). The impact on operating cash flow is not visible in the assessment as it is assumed that the additional funds available due to the measure would be invested in assets. Therefore, the impact is only visible in the financing cash flow. The impact on equity resulting from the increase in the pension scheme contributions has accumulated over time and increased the funds available in 2022 by EUR 30 mn.

Figure 27: Financial impact from Measure 2 “Increase pension contributions to RFPSS by 3.3%”



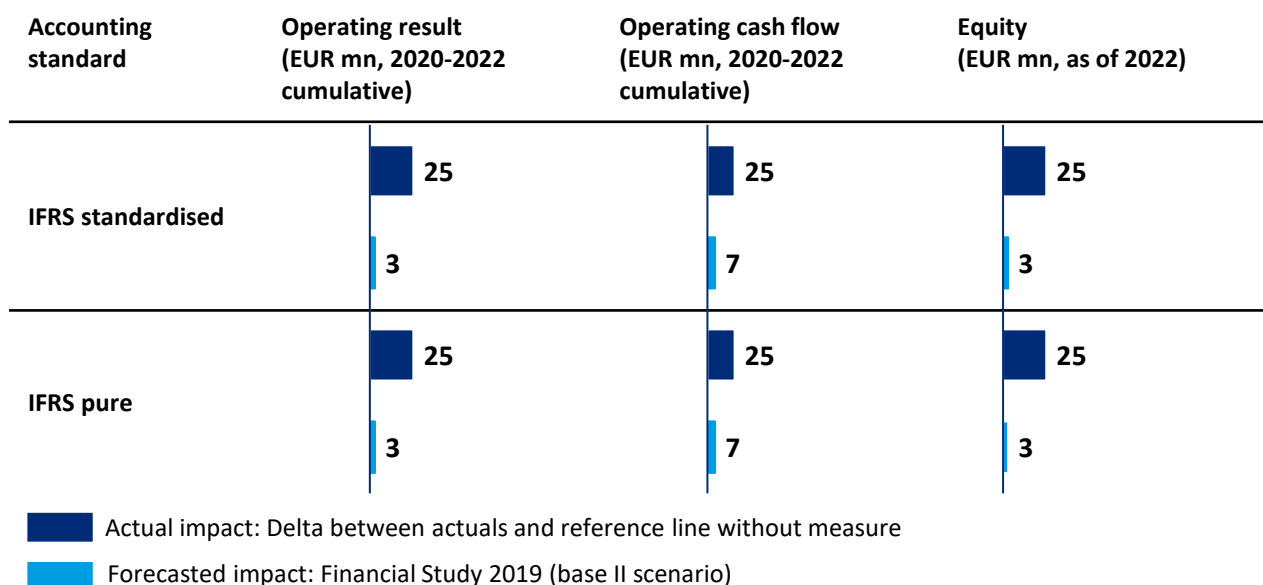
Comparison to the forecasted impact of the Financial Study 2019 (base 2 scenario)

The Financial Study 2019 projected the impact of each measure according to whether it was implemented with low, medium or high intensity. Measure 2 was implemented with low intensity, as the contributions were increased by 3.3 pp (medium intensity would have been a 5.4 pp increase, and high would have been a 9.9 pp increase). Overall results were in line with the expectations of the Financial Study 2019, as the positive impact was around EUR 30 mn, both for the operating result and for equity.

3.3.3. Measure 3: Increase procedural fees

The increase in procedural fees generated higher revenues, which had a positive impact of EUR 25 mn on both the operating result and operating cashflow. It thus resulted in an increase in equity of the same amount (Figure 28). The impact was driven by an inflation-related fee adjustment of 3% implemented on 1 April 2022.

Figure 28: Financial impact from Measure 3 “Increase procedural fees”



Comparison to the forecasted impact of the Financial Study 2019 (base 2 scenario)

The Financial Study 2019 projected the impact of each measure according to whether it was implemented with low, medium or high intensity. Measure 3 was implemented with medium intensity, as a decision was made to continue to increase the procedural fee biannually by the rate of inflation (low intensity would have been 0.25 pp below inflation, and high would have been 0.25 pp above inflation). Additional revenue generated by the inflation-related increase in procedural fees exceeded the expectations of the Financial Study 2019, as inflation was higher than anticipated in the base 2 scenario, which resulted in higher fee increases.

3.3.4. Measure 4: Digitise the patent granting process end-to-end

Digitisation, which was accelerated by Covid-19, already had a positive impact on operating result and equity in 2022 (Figure 29). This was the result of decreased replacement rates in anticipation of productivity gains due to digitisation benefits. Consequently, 258 examiners and 106 formality officers who left the EPO between 2020 and 2022 were not replaced.

Figure 29 shows that digitisation had a positive effect on the operating result and equity. A positive impact on DBO coupled with a decline in RFPSS and EPOTIF assets had an overall positive effect on equity in 2022.

While the reduction in salary mass due to decreased replacement ratios was positive for cashflow, the overall result for operating cashflow was negative due to the upfront investments of about EUR 87 mn in the 2020-2022 period following the launch of the Strategic Plan 2023.

Figure 29: Financial impact from Measure 4 “Digitise the patent granting process end-to-end”

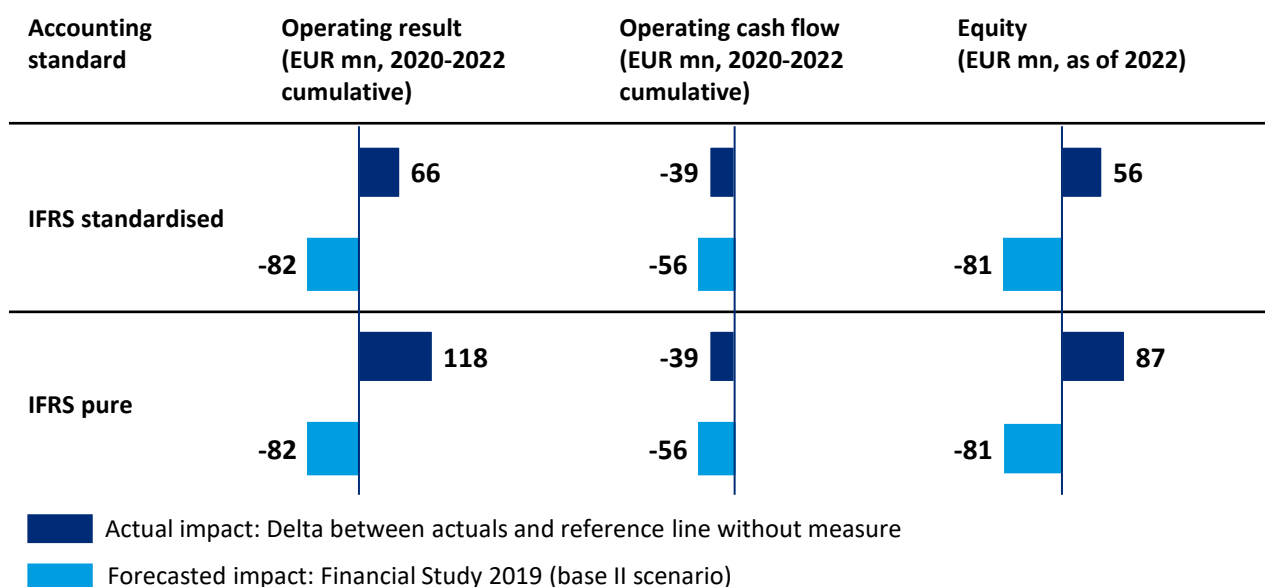
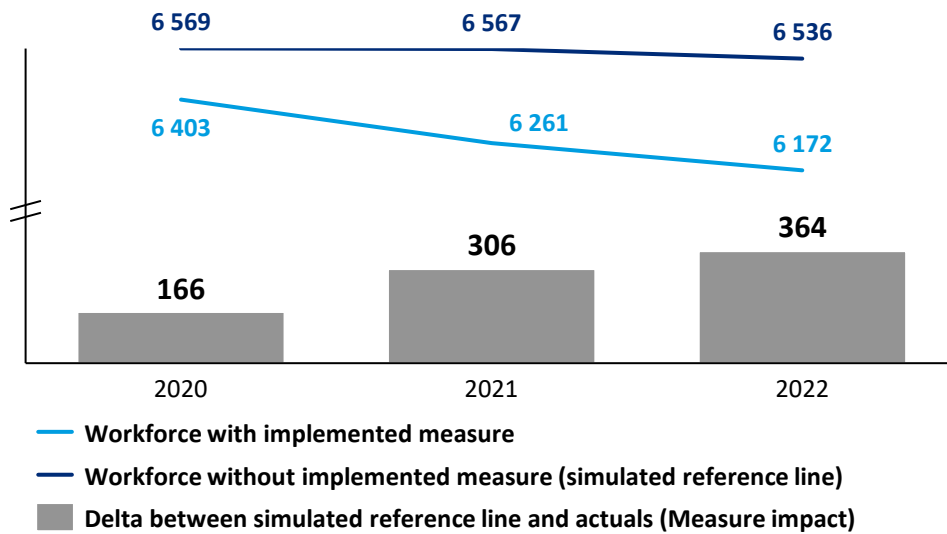


Figure 30 is showing the development of the workforce with the implemented measure and a simulated reference line, showing workforce development without the implemented measure. Overall, the workforce replacement ratio below 100% resulted in 364 fewer employees in 2022³⁷. The numbers for the workforce represent the sum of the numbers of formality officers, examiners, and “others”, while the cumulative impact considers examiners and formality officers only not considering the non-replacement of “others”.

³⁷ To maintain the 2019 level, 364 people would have had to be hired by 2022

Figure 30: Workforce³⁸, in number of employees



Comparison to the forecasted impact of the Financial Study 2019 (base 2 scenario)³⁹

As expected, operating cashflow decreased between 2020 and 2022 due to investments of approximately EUR 87 mn in digitisation. However, the digitisation already had initial positive effects on the operating result and equity in 2022, as digitisation was accelerated by Covid-19, and replacement ratios were reduced in anticipation of productivity gains.

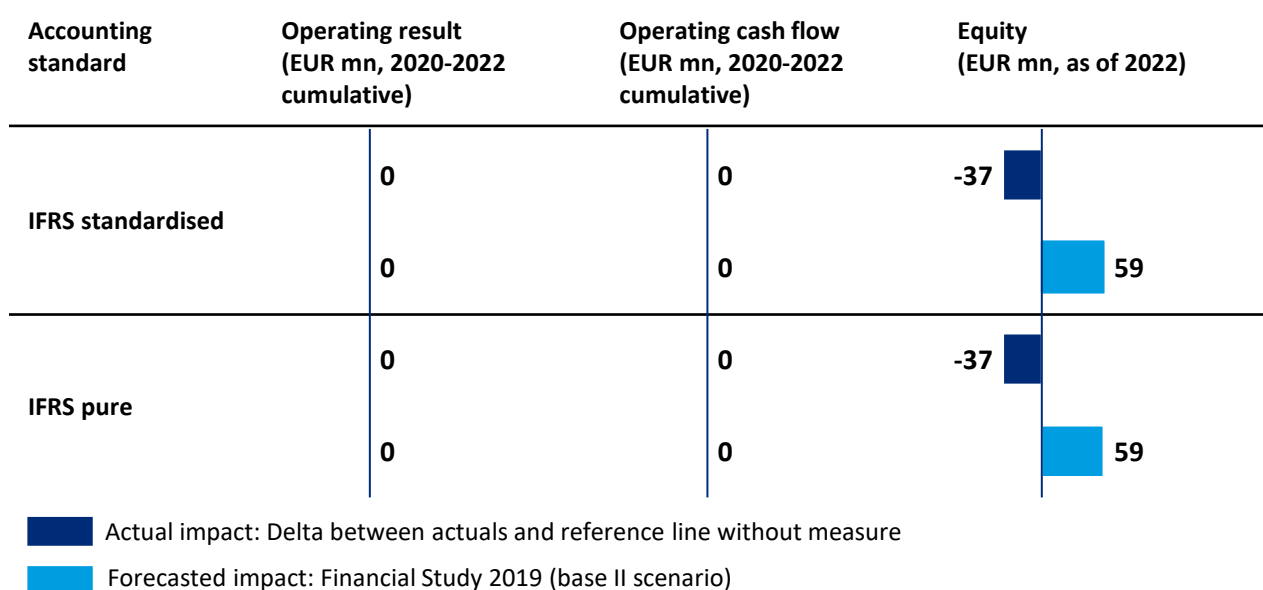
³⁸ The sum of workforce excludes young professionals in 2022

³⁹ Intensities were not specified

3.3.5. Measure 5: Invest 60% of annual cash surplus in EPOTIF

Equity was EUR 37 mn lower in 2022 than it would have been if no investments or contributions had been made in the EPOTIF, and the amounts had instead been held as cash reserves. This difference was in large part attributable to developments in capital markets, which were highly volatile during the period observed (Figure 31). However, this measure did not impact the operating result or cashflow, as potential cash in-flow from an increase of the EPOTIF is assumed to be directly reinvested into assets. In short term assets are impacted from fluctuations on the financial markets but over time the reinvestment is expected to pay off due to their expected higher long-term returns.

Figure 31: Financial impact from Measure 5 “Invest 60% of annual cash surplus in EPOTIF”



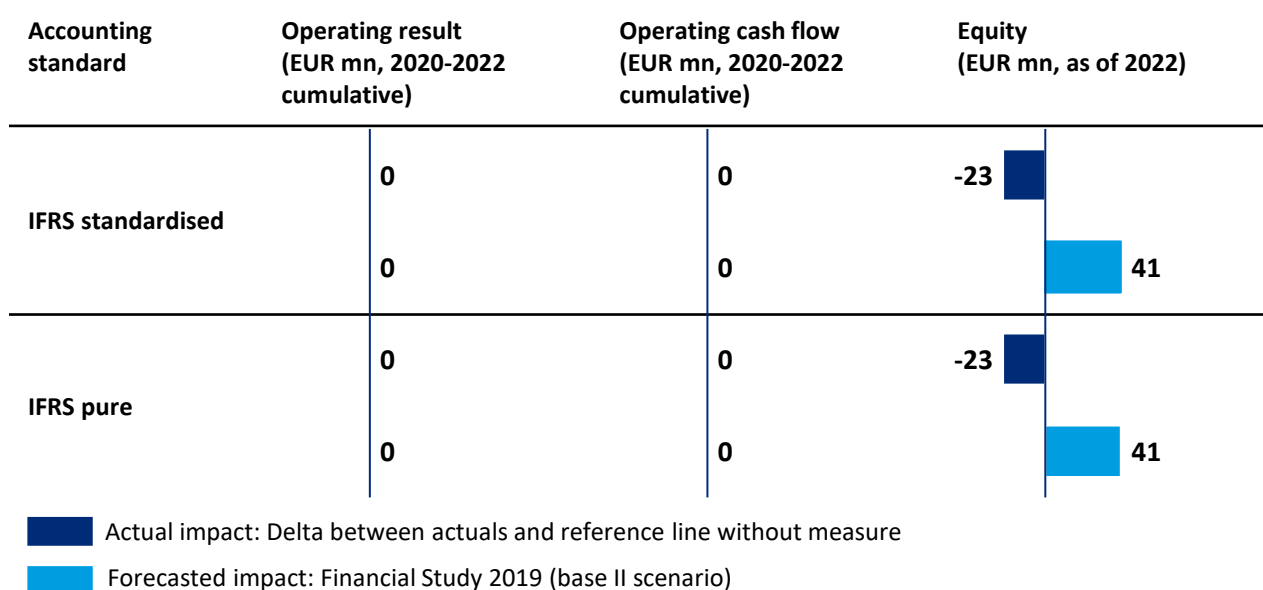
Comparison to the forecasted impact of the Financial Study 2019 (base 2 scenario)

The Financial Study 2019 projected the impact of each measure according to whether it was implemented with low, medium or high intensity. Measure 5 was implemented with high intensity, as it was decided to adjust EPOTIF transfers to 60% of the cash surplus p.a. (low intensity would have allocated 20% of the cash surplus p.a., and medium would have allocated 40%). As the Financial Study 2019 is based on long-term expected capital market returns, no meaningful comparison is possible.

3.3.6. Measure 6: Invest 40% of annual cash surplus one-off in RFPSS

Equity was EUR 23 mn lower in 2022 than it would have been if no voluntary investment had been made in the RFPSS, and the amounts had instead been held as cash reserves (Figure 32). This difference was in large part attributable to developments in capital markets, which were highly volatile during the period observed. However, this measure did not impact the operating result or cashflow, as potential cash in-flow from an increase of the RFPSS is assumed to be directly reinvested into assets. In short term assets are impacted from fluctuations on the financial markets but over time the reinvestment is expected to pay off due to their expected higher long-term returns.

Figure 32: Financial impact from Measure 6 “Invest 40% of annual cash surplus one-off in RFPSS”



Comparison to the forecasted impact of the Financial Study 2019 (base 2 scenario)

The Financial Study 2019 projected the impact of each measure according to whether it was implemented with low, medium or high intensity. Measure 6 was implemented with medium intensity, as it was decided to adjust RFPSS transfers to 40% of cash surplus p.a. (low intensity would have allocated 20% of the cash surplus p.a., and high would have allocated 60%). Due to negative developments in capital markets, no capital gains have yet materialised. As the Financial Study 2019 was based on long-term expected capital market returns, no meaningful comparison is possible.

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Oliver Wyman
Muellerstrasse 3
80469 Munich
Germany



Mercer
Platz der Einheit 1
60327 Frankfurt am Main
Germany

EUROPEAN PATENT OFFICE

Financial Study 2023

Deliverable 3: Risk matrix and impact

29 September 2023

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List of abbreviations

D1	Deliverable 1 As-Is Analysis
D2	Deliverable 2 Base Case scenario
D3	Deliverable 3 Risk matrix and impact
D4	Deliverable 4 Strategic financial assessment
EPO	European Patent Office
EPOTIF	European Patent Office Treasury Investment Fund
FTE	Full-time equivalent
GDP	Gross Domestic Product
IFRS	International Financial Reporting Standards
MTBP	Medium Term Business Plan
PGP	Patent Grant Process
PPH	Products per Head
RFPS	Reserve Funds for Pensions and Social Security
YoY	Year-on-year

1. Context and purpose of this document

1.1. Mandate of the Financial Study 2023

The main financial objectives of the European Patent Office (EPO) consist in ensuring its long-term financial sustainability and its institutional and operational independence. As the EPO is a self-financed organisation, it is of paramount importance to regularly monitor its financial situation and review its financial management and governance in a volatile economic context. The EPO mandated Oliver Wyman and Mercer to perform an independent assessment of the EPO's current financial situation and its future evolution. This engagement follows the prior engagement of Oliver Wyman and Mercer for the Financial Study 2019.

The Financial Study 2023 addresses this mandate in three distinct phases:

Phase 1 includes an As-is analysis, which assesses the current operational and financial situation of the EPO including an assessment of the impact of the six measures that were implemented following the Financial Study 2019. Additionally, this Financial Study 2023 provides a view on future financial performance and orientations of the EPO on IFRS basis over a 20-year time horizon for one Base Case using sensitivities for relevant financial and operational parameters as well as an estimate as to whether the EPO can meet its future financial obligations. All results have been forecasted based on a proprietary financial model that has been built solely for this Financial Study. All underlying assumptions of the model and its functionality are transparent and have been discussed with and validated by key stakeholders across the EPO. The results of Phase 1 provide initial findings, but at this stage do not provide any managerial recommendations as to which actions the EPO management should take and decide to communicate to relevant stakeholders. This is the case especially for all non-financial aspects of the engagement.

Phases 2 and 3 will build on the findings of Phase 1 to propose tailored measures to ensure long-term financial sustainability. This includes a proposal for an asset-liability management strategy, containing the investment strategies for RFPSS and EPOTIF.

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Mercer and Oliver Wyman have prepared the Financial Study 2023 for the EPO (together the "parties") for the purpose of assisting the EPO in understanding any financial risks associated with its business, as set out in the terms of an engagement letter between the parties dated 28 April 2023. Unless agreed otherwise in writing, Mercer and Oliver Wyman do not accept any liability or responsibility to any third party in respect of this study.

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1.2. Previous Financial Studies and differences to the Financial Study 2023

The first independent Financial Study was conducted in 2010 to review the EPO's financial situation and forecast its long-term financial sustainability. Its results formed the basis for reforms between 2011 and 2015, which were proposed by the EPO's senior management and approved by the EPO's member states.

As the economic environment is constantly evolving, it is necessary to frequently assess and review the reforms, as well as the evolution of the EPO's long-term financial position. This need led to additional Financial Studies in 2016 and 2019.

In 2010, the scenario analysis reaffirmed certain structural challenges to the EPO, such as rising total salary costs (comprising basic salaries and social security costs), declining equity and liquidity, and the potential need for additional funding. The 2016 study focussed on production and productivity and suggested a close monitoring of factors determining the EPO's financial situation. The study recommended that the EPO should maintain the financial performance it achieved during the period from 2011 to 2016 and prepare for the potential influences of external factors, such as the digitisation of business models and competing patent systems. Actions included the launch of the European Patent Office Treasury Investment Fund (EPOTIF) and measures to increase productivity.

The Financial Study 2019 used a proprietary financial model to forecast financial statements with a 20-year time horizon. Additionally, a comprehensive employee benefit model was built to ensure an acceptable probability of being able to pay future benefits out of available cash. Finally, the Financial Study 2019 allowed for different performances of the RFPSS and EPOTIF based on capital market scenarios and strategic asset allocation. Subsequent measures, proposed by the EPO's senior management and approved by the EPO's member states, were implemented between 2019 and 2022.

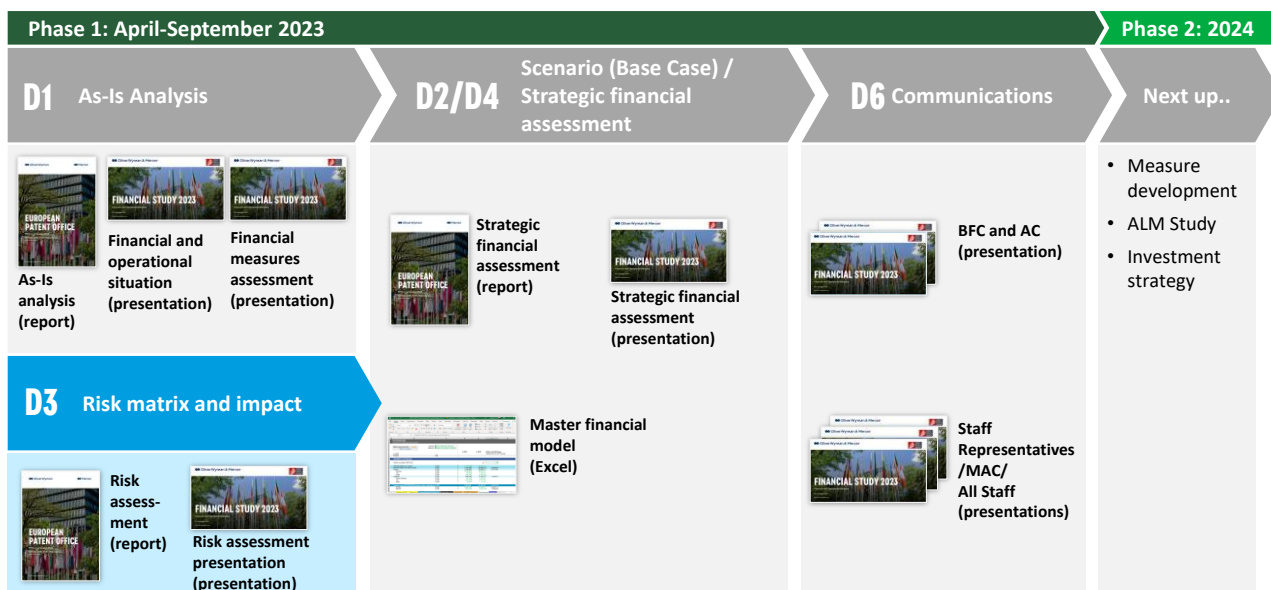
Since the Financial Study 2019, Europe has faced geopolitical, societal and economic developments including the Covid-19 pandemic, the Russian invasion of Ukraine, high inflation, and a return to a positive interest rate environment induced by central banks following the high inflation. These developments affect macroeconomic parameters and have had a significant impact on the EPO's operations (e.g., through the introduction of new working methods) and on its finances.

The Financial Study 2023 was used to independently assess the EPO's current financial situation and its evolution in the future based on a single Base Case scenario. Compared to previous Financial Studies, there was a special focus on sensitivities to financial and operational parameters to determine how robust the Base Case scenario is to changes in the operational and financial environment.

1.3. Approach

The Financial Study 2023 has been structured to provide a meaningful representation and analysis of the status quo and an assessment of sensitivities to future macroeconomic developments. The study is intended as a basis for further discussion and to support the development of risk-mitigating decisions by the EPO’s management and relevant stakeholders. Overall, the Financial Study 2023 contains the following deliverables (Figure 1).

Figure 1: Deliverables overview



As-Is Analysis: Financial and operational situation and financial measures assessment (D1)

The report includes an analysis of the EPO’s current financial and operational situation using the Financial Study 2019 and financial statements up to 2022 as starting points. To enrich the assessment, interviews with stakeholders were carried out for hypothesis testing and gap identification. The analysis is based on the same methodology as the 2019 assessment with no additional assumptions. In addition, all financial measures implemented with CA/18/20 have been assessed regarding their initial development and impact within the timeframe 2018-2022.

Risk matrix and impact (D3)

This report provides a holistic risk framework and classification for the EPO. Based on the framework potential risks to the EPO’s financial sustainability have been identified and have been evaluated in an outside-in analysis. All relevant risks for the Financial Study 2023 assessed in terms of their probability of occurrence and their financial impact. Based on this risk matrix, parameters have been identified that are relevant for the sensitivity analysis performed under the strategic financial assessment.

Strategic financial assessment (D2, D4)

The strategic financial assessment includes a financial model including simulated financial statements (D4). The operating business of the EPO is used to forecast the financial performance and orientations of the EPO with a 20-year horizon (e.g., production, workforce, revenues, salaries, investments). Parameters were defined for use in a Base Case (D2). A coverage gap or surplus is projected for 2042¹, based on the funding

¹ Coverage gap or surplus is projected for 2042 and deflated to 2022 values.

requirement and the available cash surplus. To determine how robust the Base Case (D2) is to changes in the operational and financial environment, sensitivities were calculated for the parameters classified as relevant by the risk assessment.

1.4. Purpose of this document

This report covers the deliverable “Risk matrix and impact (D3)”. As part of the Financial Study 2023, Oliver Wyman and Mercer conducted a risk assessment to provide a comprehensive analysis of risks that could impact the EPO’s financial stability in the medium and long term. Industry best practices were followed in the risk assessment to identify, evaluate and mitigate risks. The assessment provides a structured approach to risk management. It enables the EPO to prioritise and effectively address risks, while facilitating clear communication and informed decision-making. In addition, the approach can provide guidance to senior management on the allocation of resources to address risks at an early stage.

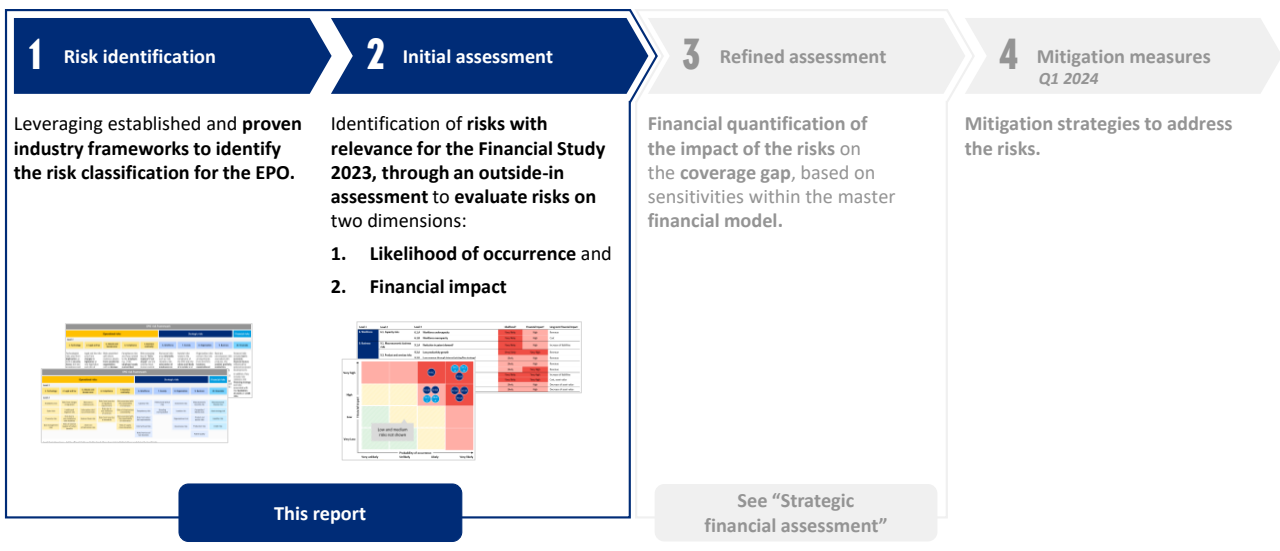
Risks are categorised as operational, strategic or financial and subsequently structured based on their respective area of impact, e.g., risks associated with the Patent Grant Process (PGP) or with support functions such as information technology, human resources, and legal services. These risks were assessed and categorised in a risk matrix according to their likelihood of occurrence and their potential financial impact (that is, the magnitude of their potential impact on the EPO’s coverage gap or surplus).

2. Risk Assessment

2.1. Methodology

Overall, our methodology followed four steps of which the first two are part of this report (see Figure 2). In the first step, the focus is on identifying all risks that may be relevant to the EPO, with the goal to create a comprehensive list of risks with a potential impact. To perform this step effectively, a framework of industry best practices is used. This framework contains categories at operational, strategic and financial levels. These categories help to ensure that no major risks are overlooked and that the risk identification process is thorough and systematic. After all potential risks have been identified in step one, they are initially assessed in a second step. This assessment followed an outside-in approach and was validated with the EPO senior management. The risks were assessed according to their probability of occurrence and their financial impact, resulting in suggestions for possible sensitivities, further assessed within the strategic financial assessment (D4).

Figure 2: Methodology



Risk identification

Best-practice industry-risk frameworks were used to comprehensively identify potential risks relevant to the EPO that could have a financial impact. For all risks, three levels were identified, with the granularity increasing from level one to level three, to identify the underlying drivers of a risk.

There is a clear progression from level 1 to level 2 and finally to level 3 within the risk framework applied. Each level builds upon the previous one to provide a structured approach to managing risks within a business or organisation. Level 1 risk categories are associated with comprehensive risk categories that have influence on the business and its broader goals. Risks that are more specific and affect particular business functions or processes within the EPO are part of the level 2 risks. Finally, the drivers of level 2 risks, are the level 3 risks which are concrete risks that can be evaluated, addressed and mitigated. Not all risks identified in the risk framework are necessarily relevant for the Financial Study 2023 and hence only a selection of risks will be considered in the subsequent sensitivity analyses.

Initial assessment

The next step was an initial assessment of relevant risks. The risks were evaluated according to two criteria: a) their probability of occurrence and b) their potential financial impact. The risk assessment first assessed the level 2 risks. Each level 2 risk that has at least a “high” financial impact and is therefore relevant to the Financial Study 2023 was further assessed by examining its drivers, the level 3 risks. Subsequently, the level 3 risks that not only have an at least “high” financial impact but also an at least “high” probability of occurrence were chosen as key risks. These are presented in a risk heat map and colour-coded green, amber, light red or red, for easy visualisation. The combination of the assessment criteria, within the heatmap, led to a classification of the severity of the risks: “low”, “medium”, “high” or “critical”. Following the assessment steps, risks relevant for the Financial Study 2023 were classified as either high or critical.

Further evaluation of the risks can be found in the strategic financial assessment (D4), where the impact of the risks has been financially quantified using sensitivities.

2.2. Risk framework and classification

A holistic risk framework is suggested to categorise risks based on their respective area of impact. The framework, as can be seen in Figure 3, differentiates between three types of risks:

- **Operational risks** are associated with risks impacting the PGP as well as support functions to the core business of the EPO
- **Strategic risks** encompass those risks posing a danger to the EPO’s overarching strategic objectives, e.g., by causing unforeseen costs or by negatively affecting the EPO’s revenue in the medium- to long term
- **Financial risks** include macroeconomic financial factors that may be influenced by unforeseen economic changes

These types are subdivided into three levels to identify the drivers of a specific risk category. Figure 3 illustrates the operational, strategic, and financial risk types deconstructed into level 1 and level 2 risks. Further detail on the distinction between these risk categories is provided in section 2.3.

Operational risks

The PGP and the EPO’s support functions are both impacted by operational risks. Events in recent years, such as the Covid-19 pandemic or the Russian invasion of Ukraine have significantly impacted the EPO’s operations. New working methods were introduced through accelerated digitisation, which brings potential for an increase in efficiency but also vulnerability. Potential risks related to the increased use of technology include security breaches and data mismanagement, which can disrupt PGP operations and the work of employees in support functions. In addition, when introducing new systems, risks can arise from a lack of competence or acceptance on the part of people operating them.

Operational risks can arise not only from tools used in daily tasks, but also from external sources beyond the EPO’s control. These potential threats include attacks and human errors from outside the EPO. Some such risks are caused by intentional, harmful actions by external entities, and they could adversely affect the EPO’s functioning. Examples include scenarios in which property, facilities or personnel are physically damaged, or intellectual property is stolen. Closely related are risks to business continuity arising from unforeseen events such as “force majeure” or “acts of God” – situations beyond direct human control.

The EPO’s operations are closely connected with laws, as it has to operate within a complex legal framework related to patents, comply with various national and international regulations, manage finances and funding, and ensure compliance with tax laws. Therefore, it is important to closely monitor new laws

or changes to existing laws that could jeopardise the core business as well as support functions. Risks can be mitigated by proactively factoring in potential additional costs arising from new tax obligations or legal requirements. Legal risks also extend to stakeholders such as employees, customers, suppliers, and competitors. In cases of litigation or unfulfilled obligations, proactive measures should be taken at an early stage to prevent adverse financial or reputational consequences.

Operational risks also include compliance risks linked to the EPO. These risks are manifested when the employer breaches established laws or self-imposed standards in its engagements with suppliers or employees, among other scenarios. Such breaches could deter suppliers or employees.

Strategic risks

Strategic risks encompass those that pose a danger to the EPO's overarching strategic objectives, for example by causing unforeseen costs or negatively affecting the EPO's revenue in the medium to long term. The first category of strategic risks includes those related to the workforce. As the EPO is a knowledge-driven organisation, employees are one of its most important assets, so risks related to the workforce could affect strategic objectives. Internally generated workforce risks could arise from legal or ethical misconduct by employees. Additionally, risks could be associated with the consequences of a judgement from the International Labour Organisation on EPO work regulations. Such risks can have a long-term financial impact, as well as a negative impact on the EPO as an attractive place to work. Other workforce-related risks stem from strategic hiring decisions related to the targeted size of the workforce – that is, overstaffing or understaffing. Overstaffing could cause overproduction or running out of stock. Understaffing could lead to overload, translating into increased stock levels and customer dissatisfaction due to prolonged waiting times.

Strategic risks also include societal risks, which relate to the EPO's alignment with the values and principles of society. These could include societal demands to abandon patents to benefit society, as it might be the case with vaccine patents during a pandemic. Such an event could lead to a severe loss of income for the EPO. Societal risks are also related to the image and reputation of the EPO as a brand.

The risk framework also includes risks arising from the organisation itself. These could relate to the geographical location, such as new laws in a certain area or difficulties in obtaining building permits, which could influence strategical planning of the EPO. Organisational risks are also associated with error-prone or overly complex administrative procedures that can lead to a lack of agility when aligning the organisation with strategic goals. In addition, the risk framework considers potential cost increases due to capital expenditure. It is of great importance to the EPO to mitigate organisational risks, as they could have negative financial consequences with a significant impact on long-term strategic plans.

It is also essential for the strategic direction of the EPO to look at risks arising from its core business – that is the PGP. These risks can relate to the product portfolio, production processes or the quality, timeliness, and design of the EPO products. The hallmark of the EPO's quality is the correct and accurate processing of patent applications, making it particularly important to monitor the associated risks and to consider shifts in the market when steering the organisation. Continuous observation of the market is therefore important to identify risks at an early stage that arise from competition with other patent offices or knowledge institutions. The EPO should focus on market dynamics and customer behaviour to make strategic decisions that avert such risks at an early stage. Moreover, risks associated with failed timeliness ambitions are considered strategic risks, as the potential financial impact would be pronounced, in case of decreasing customer satisfaction if patent applications take too much time to be processed, which in turn would lead to a decrease in revenue if customers would decide to withdraw their patent applications.

Financial risks

Financial risks include macroeconomic financial factors that may be influenced by unforeseen economic changes. As changes in macroeconomic parameters have a high impact on the EPO's financials, it is very important to monitor them continuously.

Financial risks to the EPO include the impact of decreasing interest rates, which lower AA-corporate bond yields and affect financial stability. Furthermore, an increase in inflation can weaken purchasing power and make financial planning more difficult. Since the EPO links salary and pension adjustments to inflation, salary and pension expenses are very sensitive to a change in inflation. Financial risks also include underperformance of the equity market and of assets, which could lead to lower investment returns. Another concern is that it might not be possible to sell assets quickly and without significant losses, which could affect short-term liquidity. Finally, insufficient cash flow would affect the EPO's ability to cover expenses and meet its financial obligations.

Figure 3: Risk framework

EPO risk framework									
Operational risks					Strategic risks			Financial risks	
<i>Level 1</i>									
1. Technology	2. Legal and tax	3. Attacks and human error	4. Compliance	5. Business continuity	6. Workforce	7. Society	8. Organisation	9. Business	10. Financials
<i>Level 2</i>									
Availability risks	Risks from changes in legislation	Risks due to malicious acts	Risks from breaches of regulatory requirements	Risks associated with the unavailability of employees	Capacity risks	Political and ethical risks	Investment risks	Macroeconomic business risk	Macroeconomic financial risk
Cyber risks	Liability and litigation risks	Information risks/ loss of know-how	Risks due to non-fulfilment of contracts	Risks of infrastructure unavailability	Competency risks	Branding and reputation	Location risk	Competitor/ Market risks	Asset strategy risk
IT security risks	Risks due to non-compliance with deadlines	External fraud risks	Risks from breaches of standards	Risks associated with the unavailability of information	Risks from labour law requirements		Organisational risk	Product and service risks	Liquidity risks
Data management risks	Risks of national taxation of certain benefits	Asset and infrastructure risks		Risks of supply chain disruption	Internal fraud risks		Governance risks	Production risks	Credit risks
					Risks from loss of key functions			Patent Quality	

Level 3 not shown here – but for all level 2 risks we further break them down into individual drivers underlying the level 2 risks

2.3. Risks relevant for the Financial Study 2023

To identify risks relevant for the Financial Study 2023, they were assessed based on their likelihood of occurrence² and their potential financial impact³. The risk assessment first considered the level 2 risks, which can be seen in Figure 4. Each Level 2 risk that has at least a “high” financial impact and is therefore relevant to the 2023 Financial Study was further assessed by examining its drivers, the level 3 risks (Figure 5, Figure 6 and Figure 7). Subsequently, the level 3 risks that not only have an at least “high” financial impact but also an at least “high” probability of occurrence were selected as key risks in an impact probability matrix.

All operational level 2 risks were considered to only impact the day-to-day operational processes of the EPO and not its strategic objectives. Therefore, their financial impact was ranked as low, and they were not considered as relevant for the Financial Study 2023. Thus, the following sections outline risks on a strategic and financial level.

2.3.1. Strategic risks

Within the category of strategic risks, there are specific risks that have at least a “high” financial impact. As the risks in this category could have an impact on the overall strategic planning of the EPO, it is particularly important to assess these risks. These risks have been associated with the more specific level 2 risks in workforce, society, organisation, and business. Those level 2 risks are driven by level 3 risks, which are specific risks that can be assessed, addressed, and mitigated, and are further explored in this section.

Workforce

As described in Section 2.2, workforce risks are of great importance for the EPO, as it is a knowledge-driven organisation whose functioning is based on the people working for the EPO. Capacity (and productivity improvements) must be planned to achieve production targets. If targets are not met with the planned capacity, revenue is potentially impacted in the long-term. Therefore, level 2 capacity risks were classified as risks with high potential financial impact and high probability of occurrence (Figure 4). Subsequently, as capacity risks were assessed to have a potential high financial impact, the level 3 risks driving capacity risks were assessed. Those are caused by imbalances in the workforce, either through undercapacity or overcapacity which rated as having a potentially high financial impact, as it is difficult to predict when efficiency gains (e.g., through digitalisation) will be achieved (Figure 5). Undercapacity of manpower is assessed as very likely to occur as it would lead to a decrease in revenue as fewer patents could be processed. Overcapacity, assessed as less but still likely, could lead to overproduction, running out of work and a resulting loss of efficiency.

Society

Societal risks, which are part of the strategic risks, relate to how well the EPO is aligned with the values and principles of society. The more detailed level 2 risk, associated with society risk, are political and ethical risks. Those were assessed as likely to materialise with a high financial impact (Figure 4). Hence, the drivers of the level 2 risks were assessed (Figure 5). Risk drivers are either the risks related to society's demand to drop patents, as the patented good or idea is seen as more valuable in society if it is not patented, or risks arising from political instability. Risks from political instability were rated as having a “high” financial impact in case of occurrence but with an unlikely occurrence. The risks stemming from the society to

² Likelihood scale: very unlikely; unlikely; likely; very likely

³ Financial impact scale: very low (increase in the coverage gap that is immaterial in terms of long-term financial sustainability); low (increase in the coverage gap not expected to threaten the strategic ambitions of the EPO); high (material increase in the coverage gap, threatening the strategic ambitions of the EPO); very high (material increase in the coverage gap, threatening the existence of the EPO as a self-financing organisation)

demand a drop in patents, as the patented good or idea is seen as more valuable in society if it is not patented (e.g., open-source software), was assessed with a “likely” occurrence but a “low” financial impact. Consequently, both drivers for political and ethical risks were not classified as key risks.

Organisation

Organisational risks within the strategic risk category include investment risks as level 2 risks, which have been assessed as unlikely but with high potential financial impact (Figure 4). Thus, level 3 risks were considered (Figure 5). Investment risks are driven by risks in capital planning and investments, as well as financing risks due to insufficient funds, which could cause additional costs for the EPO. These have been assessed as having a high financial impact but with an unlikely probability of occurrence and are therefore not further assessed in the heat map.

Business

For the strategic direction of the EPO, it is of major importance, to continuously monitor risks arising from the business itself and risks associated with the PGP. Additionally, business risks could arise from changing trends and shifts in the economy impacting patent demand or potential threats to the product quality that could disrupt the strategic plan. Hence, all business-related level 2 risks were assessed to have a potential “high” financial impact, as can be seen in Figure 4.

Thereby, macroeconomic business risks, as level 2 risks, could occur due to a reduction in patent demand. They were evaluated as very likely to transpire and are associated with a very high financial impact: They would result in a decline in income earned from fees, causing a decrease in revenue. A reduction in patent demand would potentially have a high financial impact, as it would have a negative effect on revenue (Figure 6).

In addition, competition or market risks are considered as business risks. They could be caused, e.g., by superior performance of other knowledge institutions or a change in the market composition, as the EPO is engaged in monopolistic activities. These risks have been classified as having a potentially high financial impact but are considered unlikely to occur (Figure 6).

Product and service risks and production risks, both subdivisions of business risks, are considered as likely and to have a potentially high financial impact. Product and service risks are driven by a potential lower productivity growth than planned, which would significantly impact production, or low revenue through internal pricing or fee strategy. Given the EPO’s public mandate, the possibilities for fee adjustments are limited, potentially posing a threat when additional revenue through fees would be required but can’t be achieved. Hence, both of those level 3 risks are considered to have an at least likely occurrence and an at least high financial impact (Figure 6). At the same time the risks through increased patent oppositions, lower revenue through the unitary patent or risks associated with customer attrition were assessed with a low financial impact and are therefore not relevant for the further assessment. Drivers of the production risks are increased stock levels or failed timeliness ambitions, which were also assessed to have an at least high financial impact, as they could lead to a decrease in revenues, while the risk from an inadequate Search and Examination ratio, as driver, was evaluated with a low financial impact (Figure 6).

Finally, patent quality risks, a subdivision of business risks driven by a lack of quality control (e.g., of legal certainty, predictability, or consistency) are assumed to carry a potentially high financial impact but to be unlikely to occur. Hence, they are not further assessed.

2.3.2. Financial risks

Financial risks include macroeconomic financial factors that may be influenced by unforeseen economic changes. As changes in macroeconomic parameters have a high impact on the EPO’s financials, it is very important to monitor them continuously.

Financials

Macroeconomic financial risks, part of level 2 financial risks, are perceived as very likely to transpire and to have a potentially very high financial impact (Figure 4). They could consist of a change in interest rate or an increase in inflation or underperformance of the equity market. All level 3 risks driving the level 2 macroeconomic financial risks are considered to have at least a high financial impact and to be either likely or very likely (Figure 7). While a change in interest rate could lead to increased liabilities, underperformance of the equity market or an increase in inflation could lead to a decrease in asset values.

An increase in inflation could potentially also lead to increased costs, as employee benefit expenses and salary increases are linked to inflation. However, increased inflation and increased financial asset return often occur simultaneously, thus, partially mitigating the risk. The risk from asset strategy is mainly driven by the level 3 risk of an underperformance of assets, that is assessed as likely and having a potentially high financial impact.

Asset strategy risks, a subcategory of financial risks, were rated as likely and potentially high in their financial impact (Figure 4). Therefore, in a next step, their level 3 risks were assessed (Figure 7). The risk from the asset strategy is driven by the level 3 risk of underperformance of assets, which is assessed as likely and having a high financial impact, as the value of the EPO's assets would decrease. While this level 3 risk is presented in more detail in the heat map, another level 3 risk driving the risks from the asset strategy, namely that the EPO is unable to liquidate assets in the short term without significant losses, has been assessed with a high financial impact on revenue. Even though it is considered as "unlikely" to occur it is nevertheless prudent for the EPO to actively manage and monitor this risk, i.e., through establishing an ALM strategy.

Liquidity risks, unlike the other subdivisions of financial risks, were regarded as unlikely, yet their potential financial impact was classified as high. They are driven, e.g., by a risk of insufficient cash flow generation.

Figure 4: Assessment of level 1 and level 2 risks

Risk type	Level 1	Level 2	Likelihood ¹	Financial impact ²
Operational risks	1. Technology	1.1. Availability risks	Likely	Low
		1.2. Cyber risks	Likely	Low
		1.3. IT security risks	Likely	Low
		1.4. Data management risks	Unlikely	Low
	2. Legal and tax	2.1. Risks from changes in legislation	Unlikely	Low
		2.2. Liability and litigation risks	Likely	Low
		2.3. Risks due to non-compliance with deadlines	Unlikely	Low
		2.4. Risks of national taxation of certain benefits	Unlikely	Low
	3. Attacks and human error	3.1. Risks due to malicious acts	Likely	Low
		3.2. Information risks/loss of know-how	Likely	Low
		3.3. External fraud risks	Unlikely	Low
		3.4. Asset and infrastructure risks	Unlikely	Low
	4. Compliance	4.1. Risks from breaches of regulatory requirements	Unlikely	Low
		4.2. Risks due to non-fulfilment of contracts	Unlikely	Low
		4.3. Risks from breaches of standards	Unlikely	Low
	5. Business continuity	5.1. Risks associated with the unavailability of employees	Unlikely	Low
5.2. Risks of infrastructure unavailability		Likely	Low	
5.3. Risks associated with the unavailability of information		Unlikely	Low	
5.4. Risks of supply chain disruption		Unlikely	Low	
Strategic risks	6. Workforce	6.1. Capacity risks	Very likely	High
		6.2. Competency risks	Likely	Low
		6.3. Risks from labor law requirements	Unlikely	Low
		6.4. Internal fraud risks	Unlikely	Low
		6.5. Risks from loss of key functions	Likely	Low
	7. Society	7.1. Political and ethical risks	Likely	High
		7.2. Branding and reputation	Unlikely	Low
	8. Organisation	8.1. Investment risks	Unlikely	High
		8.2. Location risk	Unlikely	Low
		8.3. Organisational risk	Unlikely	Low
		8.4. Governance risks	Likely	Low
	9. Business	9.1. Macroeconomic business risks	Very likely	High
		9.2. Competitor/Market risks	Unlikely	High
		9.3. Product and service risks	Likely	High
		9.4. Production risks	Likely	High
9.5. Patent Quality		Unlikely	High	
Financial risks	10. Financials	10.1. Macroeconomic financial risks	Very likely	Very high
		10.2. Asset strategy risks	Likely	High
		10.3. Liquidity risks	Unlikely	High
		10.4. Credit risks	Very unlikely	Low

¹ Likelihood scale: very unlikely; unlikely; likely; very likely

² Financial impact scale: very low (increase in the coverage gap that is immaterial in terms of long-term financial sustainability); low (increase in the coverage gap not expected to threaten the strategic ambitions of the EPO); high (material increase in the coverage gap, threatening the strategic ambitions of the EPO); very high (material increase in the coverage gap, threatening the existence of the EPO as a self-financing organisation)

Figure 5: Workforce, society, and organisation risks on level 3

Level 1	Level 2	Level 3	Likelihood ¹	Financial impact ²	Long-term financial impact
6. Workforce	6.1. Capacity risks	6.1.A Workforce undercapacity	Very likely	High	Revenue
		6.1.B Workforce overcapacity	Likely	High	Cost
7. Society	7.1. Political and ethical risks	7.1.A Demand, e.g. by society, to drop patents due to societal added value (e.g. dropping patents for vaccines during a pandemic)	Likely	Low	Revenue
		7.1.B Political instability	Unlikely	High	Revenue
8. Organisation	8.1. Investment risks	8.1.A Investment and capital planning risks (e.g., buildings, infrastructure, IT)	Unlikely	High	Cost
		8.1.B Financing risks (e.g., sufficient available funding)	Unlikely	High	Cost

¹ Likelihood scale: very unlikely; unlikely; likely; very likely

² Financial impact scale: very low (increase in the coverage gap that is immaterial in terms of long-term financial sustainability); low (increase in the coverage gap not expected to threaten the strategic ambitions of the EPO); high (material increase in the coverage gap, threatening the strategic ambitions of the EPO); very high (material increase in the coverage gap, threatening the existence of the EPO as a self-financing organisation)

Figure 6: Business risks on level 3

Level 1	Level 2	Level 3	Likelihood ¹	Financial Impact ²	Long-term financial impact
9. Business	9.1. Macroeconomic business risk	9.1.A Reduction in patent demand ³	Very likely	High	Revenue
		9.2. Competitor/Market risks	9.2.A Risk of increasing competition among IP5 (e.g., pricing/fee strategy)	Unlikely	High
	9.2.B Risk of changing competition with national patent offices (e.g., pricing/fee strategy)		Unlikely	High	Revenue
	9.2.C Risk of faster product delivery at competitors		Unlikely	High	Revenue
	9.2.D Risk of competition in EPC and PCT		Unlikely	High	Revenue
	9.3. Product and services risks		9.3.A Low productivity growth	Very Likely	Very High
		9.3.B Low revenue through internal pricing/fee strategy ⁴	Likely	High	Revenue
		9.3.C Increasing patent oppositions (reputation, legal costs, increased workload)	Unlikely	Low	Revenue
		9.3.D Risks in lower revenue from fees due to the unitary patent	n.a.	n.a.	Revenue
		9.3.E Risk of customer attrition due to lower satisfaction with EPO products	Likely	Low	Revenue
	9.4 Production risks	9.4.A Risk of inadequate S/E strategy	Likely	Low	Revenue
		9.4.B Increased stock	Likely	High	Revenue
		9.4.C Failed timeliness ambitions	Likely	Very High	Revenue
	9.5 Patent Quality	9.5.A Quality control issues	Unlikely	High	Revenue
		9.5.B Lack of EPO quality touchstones such as legal certainty, predictability and consistency	Unlikely	Low	Revenue

Relevant for Financial Study 2023

¹ Likelihood scale: very unlikely; unlikely; likely; very likely

² Financial impact scale: very low (increase in the coverage gap that is immaterial in terms of long-term financial sustainability); low (increase in the coverage gap not expected to threaten the strategic ambitions of the EPO); high (material increase in the coverage gap, threatening the strategic ambitions of the EPO); very high (material increase in the coverage gap, threatening the existence of the EPO as a self-financing organisation)

³ Lower GDP and/or R&D expenditure growth

⁴ Given the EPO’s public mandate, the possibilities for fee adjustments are limited

Figure 7: Financial risks on level 3

Level 1	Level 2	Level 3	Likelihood ¹	Financial Impact ²	Long-term financial impact
10. Financials	10.1. Macroeconomic financial risk	10.1.A Decrease in interest rate	Very likely	Very high	Increase of liabilities
		10.1.B Increase in inflation ³	Very likely	Very high	Cost, asset value
		10.1.C Underperformance of equity market	Likely	High	Decrease of asset value
	10.2. Asset strategy risk	10.2.A Underperformance of assets ⁴	Likely	High	Decrease of asset value
		10.2.B Risks of not being able to liquidate assets in the short term/without significant losses	Unlikely	High	Revenue
	10.3. Liquidity risks	10.3.A Risk of insufficient cash flow generation	Unlikely	High	Revenue
		10.3.B Risks of not being able to liquidate assets in the short term/without significant losses	Unlikely	High	Revenue

Relevant for Financial Study 2023

¹ Likelihood scale: very unlikely; unlikely; likely; very likely

² Financial impact scale: very low (increase in the coverage gap that is immaterial in terms of long-term financial sustainability); low (increase in the coverage gap not expected to threaten the strategic ambitions of the EPO); high (material increase in the coverage gap, threatening the strategic ambitions of the EPO); very high (material increase in the coverage gap, threatening the existence of the EPO as a self-financing organisation)

³ Inflation has an impact on employee benefit expenses and on salary increases

⁴ Attributable to chosen asset strategy

2.4. Risk assessment and matrix

Classifying risks in a matrix of probability of occurrence and financial impact is a practical and versatile approach to risk management. It enables the assessment, prioritisation and effective management of risks by the EPO, while facilitating clear communication and informed decision-making. This approach assists in consciously allocating resources to risk management and considering the potential consequences of the identified risks. The heat map draws on the risk assessment and displays level 3 risks that are at least likely to occur, and which would have a potential financial impact rated as at least high (see Figure 8). Risks were assessed following an outside-in approach, validated with the EPO senior management.

Critical risk severity

Risks classified as very likely to occur and having a potentially very high financial impact were categorised as critical. Such risks would stem from decreased productivity growth, which could potentially lead to a reduction in revenue. In addition, macroeconomic financial risks contribute to this category, such as a change in interest rates or inflation.

Risks categorised as likely to occur and with a very high potential financial impact were also classified as critical. This encompasses the failure to meet timeliness ambitions, for which the potential financial impact would be pronounced. Failure in timeliness ambitions could have a negative impact on the EPO's finances in the long run, as customer satisfaction could decrease if patent applications take too much time to be processed, which in turn would lead to a decrease in revenue if customers decide to withdraw their patent applications.

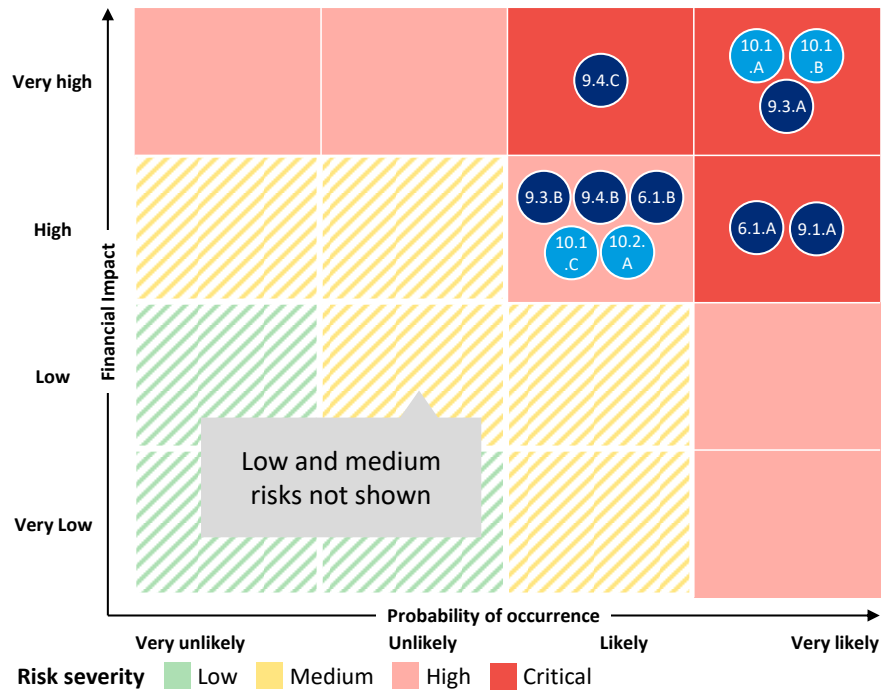
The risks of workforce undercapacity is assessed as very likely and as having a potentially high financial impact. This combination, too, resulted in a risk severity classification of critical. Undercapacity would present a risk of reduced revenue due to production capacity limitations. A reduction in patent demand was also assessed as very likely with a potentially high financial impact, and it too was classified as critical in terms of risk severity: It could lead to reduced incoming workload and fee income over the medium to long term.

High risk severity

Risks that are likely to occur and have a potentially high financial impact were classified as having a high severity of risk. This classification was assigned to the risk associated with increased stock, as prolonged customer waiting times could trigger dissatisfaction and customer attrition. Low revenues due to internal pricing or fee strategies were also given a high-risk severity level. This section of the heat map, with a likely probability and a potentially high financial impact, also included the risks stemming from underperformance in equity markets or in assets, which would put the value of the EPO's assets at risk. Finally, risks associated with overcapacity were assessed with a high risk severity, as they are less likely to occur than undercapacity risks but could still lead to overproduction, running out of work and a resulting efficiency loss.

In conclusion, consistent risk review and proactive mitigation measures are paramount. Addressing risks at an early stage serves as a preventive measure against potential disruptions.

Figure 8: Heat map of key financial risks



Strategic risks	Workforce	6.1.A	Workforce undercapacity	Critical
		6.1.B	Workforce overcapacity	High
	Business	9.1.A	Reduction in patent demand ¹	Critical
		9.3.A	Low productivity growth	Critical
		9.3.B	Low revenue through internal pricing/fee strategy ²	High
		9.4.B	Increased stock	High
9.4.C	Failed timeliness ambitions	Critical		
Financial risks	Financials	10.1.A	Decrease in interest rate	Critical
		10.1.B	Increase in inflation ³	Critical
		10.1.C	Underperformance of equity market	High
		10.2.A	Underperformance of assets ⁴	High

¹ Lower GDP and/or R&D expenditure growth

² Given the EPO's public mandate, the possibilities for fee adjustments are limited

³ Inflation has an impact on employee benefit expenses and on salary increases

⁴ Attributable to chosen asset strategy

3. Base Case sensitivities

The initial assessment is showing the potential threat of key risks. Should they materialise, they can significantly impact the EPO's financial positions. This underlines the importance of continuous monitoring and steering of the EPO's finances. In the course of the Financial Study 2023 the financial position of the EPO is assessed through a financial model which utilises a Base Case. The Base Case projects key external, operational and financial parameters until 2042 (strategic financial assessment (D4)). For relevant risks respective operational or financial parameters within the model were identified, which can be utilised to propagate the risk within the model. In addition, these parameters are likely to form the baseline for the SAFE app⁹. Sensitivities are different characteristics of these parameters within the confines of the financial model and illustrate the impact on the financial position of the EPO. As they are evaluated within the financial model, they are subject to all modelling paradigms (detailed in D4) and can serve as an indication of the financial magnitude of the risk, but not as a comprehensive assessment.

Figure 9 shows sensitivities that result from operational parameters, and Figure 10 shows sensitivities for financial parameters. Together, these sensitivities correspond to the main macroeconomic and internal risks, and they describe deviations from the expected behaviour of parameters as given in the Base Case. The expected financial impact of these deviations was evaluated in the strategic financial assessment (D4).

Sensitivities from operational parameters

EPO productivity in products per full-time equivalent (FTE): One risk identified in the impact assessment is the risk of a decline in productivity. It is therefore crucial to understand how a change in productivity will affect the EPO's finances. Productivity at the EPO can be measured in products per FTE. Therefore, the parameter used for the sensitivities to further assess the productivity risk is products per FTE. In the Base Case, productivity increases to 128 products per FTE by 2028 and further rises to 157 products per FTE by 2035. After 2035, productivity is maintained at 157 products per FTE. The first sensitivity to the Base Case, which considers the risk of an insufficient growth in productivity, assumes no productivity growth after 2028. Consequently, the products per FTE would increase to 128 by 2028 and remain constant thereafter. The second sensitivity to be quantified assumes productivity growth until 2028 and an increase by +1 product per FTE per year productivity growth after 2028 reaching 142 products per FTE in 2042.

Examiner workforce evolution: Risks from workforce overcapacity and undercapacity were assessed as having a high financial impact. This risk was assessed through the parameter of workforce evolution. The Base Case assumes that the workforce will shrink by 0.8% a year until 2028 and then be maintained at a stable number. For the first sensitivity, the workforce is assumed to decrease by 0.8% p.a. until 2028 and subsequently grow at 1% p.a. The second sensitivity assumes stronger action to accommodate productivity shortfalls: The workforce still decreases by 0.8% p.a. until 2028 but is then increased at 2% p.a. to reach 4 958 in 2042.

Workload: The risk associated with a slow-down in patent demand is assessed through the growth in incoming workload. The Base Case assumes an increase in workload of 1.9% p.a. until 2028 and lower annual growth of 0.8% after 2028. The first sensitivity is based on the historic 10-year average growth observed in the medium-term business plan (MTBP). It assumes a strong increase in incoming workload of 2.5% p.a. until 2028, followed by an increase in incoming workload of 1.9% p.a. thereafter. The second sensitivity is linked to the GDP forecast, and it assumes low growth in incoming workload between 2023 and 2028 of 1.1% p.a., followed by growth of 0.8% p.a. after 2028.

Timeliness: Timeliness sensitivities are used to measure the financial impact that would result from satisfying increased customer demands on timeliness. Unfulfilled timeliness targets result in a stock increase. Hence, the timeliness parameter is related to the risk of increased stock. The Base Case assumes

⁹ Part of a later phase of the Financial Study 2023

that the “Paris criteria”¹⁰ will be met in the second half of the forecasting period. A total of three sensitivities were defined for a comprehensive timeliness assessment, with each meeting the Paris criteria in at different time: the first quarter, the first half or at the end of the forecasting period.

¹⁰ Paris Criteria – represents the derivation of concrete timeliness objectives by the EPO in accordance with the long-term ambition to deliver a European patent within three years from filing on average. This is represented as six output-months for Search and 36 output-months for Examinations

Figure 9: Sensitivities resulting from operational parameters

Operational parameter ¹	Timeframe	Base Case	Sensitivity 1		Sensitivity 2		Associated risk
		Value	Value	Rationale	Value	Rationale	
1 Productivity in products per FTE ²	2023-2042	+2.1% p.a. (106 products per FTE to 157 products per FTE)	-1 products per FTE p.a. compared to Base Case after 2028	All productivity gains are realised by 2028, with no further improvement between 2029 and 2042	-2 products per FTE p.a. compared to Base Case after 2028	Productivity increase of +1 product per FTE p.a. is realised every year after 2028	9.3.A
2 Examiner workforce growth ³	2023-2028	-0.8% p.a. from 3 957 to 3 794 ⁴ (Replacement ratio: 80%/130%/70%/40%/80%/80%)	Same as Base Case	Steady (+1.0% p.a.) workforce increase after 2028 to accommodate productivity shortfalls	Same as Base Case	Steady (+2.0% p.a.) workforce increase after 2028 to accommodate productivity shortfalls	6.1.A 6.1.B
	2029-2042	Fixed at 3 794	Growth rate +100 bp p.a. compared to Base Case		Growth rate +200 bp p.a. compared to Base Case		
3 Workload ⁵	2023-2042	Average annual growth rate of +1.1% p.a.	Parallel shift +100 bp of average annual growth rate	High incoming workload growth (MTBP historic)	Parallel shift -20 bp of average annual growth rate	Low incoming workload growth (linked to GDP forecast)	9.1.A
4 Timeliness ⁶	2023-2042	"Paris Criteria" in second half of the forecasting period	"Paris Criteria" earlier than Base Case	More ambitious target setting	Meet "Paris Criteria" later than Base Case	Less ambitious target setting	9.4.C 9.4.B

¹ It is assumed that timeliness targets are achieved for every sensitivity, determining the relationship between productivity and workforce

² Shortfalls in comparison to the Base Case assumed to be compensated by an increase in workforce

³ Excess in workforce leads to a relaxed productivity target

⁴ As per VP4 guidance regarding replacement ratios, discrepancy of 11 examiners to MTBP in 2028 due to HR retirement data

⁵ Assumed to be compensated by an increase in workforce

⁶ Shift in timeliness targets to be compensated by increase in workforce

Sensitivities from financial parameters

Figure 10 shows the sensitivities for the financial parameters used to assess the remaining key risks.

Procedural fee increases and internal renewal fee increases: The risk of having a lowered revenue through internal pricing decisions or the chosen fee strategy is considered for two parameters on which sensitivities were calculated on: a) the procedural fee increases and b) the internal fee increases. Both are considered to increase by 0.0% p.a. in the Base Case. The first sensitivity for both parameters incorporate the current fee increases as they are proposed by the EPO which would include one fee increase of 5.0% in 2024, while the second sensitivity (equal for both sensitivities) assumes biennial fee increases by inflation as it is the current practice¹².

EPOTIF/RFPSS returns: As the discount rate is tied to the asset return rate the risks from a decrease in discount rate can be assessed by looking at the sensitivities on the EPOTIF/RFPSS returns. Additionally, risks from the decrease in the interest rate, from the underperformance of the asset market and the underperformance of invested assets are considered by the sensitivities from the EPOTIF/RFPSS asset return. Those risks are assessed in real terms and thus, do not consider a change in inflation. The asset return is 4.6% (66% percentile (geometric return)) in the Base Case, and 3.6% (80% percentile (geometric return)) in the first sensitivity, reflecting a low-risk appetite with a more conservative investment strategy, while the second sensitivity expects a return of 5.9% (50% percentile (geometric return)), reflecting a high-risk appetite with a more aggressive investment strategy.

Inflation: The risk of different rates of inflation is considered using shifts of plus or minus 100 basis points. The Base Case assumes average annual inflation of 2.3%, while the first sensitivity considers it at 3.3%, and the second at 1.3%. Sensitivities maintain the nominal return rates of the Base Case and thus reflect a true inflation shock that impact real returns.

¹² As confirmed in CA/61/21

Figure 10: Sensitivities resulting from financial parameters

Financial parameter	Base Case	Sensitivity 1		Sensitivity 2		Associated risk
	Value	Value	Rationale	Value	Rationale	
5 Procedural fee increases	0.0% p.a.	+5.0% in 2024	Current fee increase proposed by the EPO	Biennial increase by inflation	Current practice confirmed in CA/61/21	9.3.B
6 Internal renewal fee increases	0.0% p.a.	+5.0% in 2024	Current fee increase proposed by the EPO	Biennial increase by inflation	Current practice confirmed in CA/61/21	9.3.B
7 EPOTIF/RFPSS returns ^{1,2}	4.6%	Parallel shift of -100 bp compared to Base Case	Low risk appetite reflected in more conservative asset strategy (80% percentile (geometric return))	Parallel shift of +130 bp compared to Base Case	High risk appetite reflected in more aggressive asset strategy (50% percentile (geometric return))	10.1.A, 10.1.C, 10.2.A
8 Inflation	2.3% (average)	Parallel shift of +100 bp compared to Base Case	Increase of the YoY inflation by 100 bp	Parallel shift of -100 bp compared to Base Case	Decrease of the YoY inflation by 100 bp	10.1.B

¹ Sensitivity on RFPSS and EPOTIF are calculated as a change on real returns, inflation assumptions remain the same as in the Base Case

² Expected asset returns are also used to determine the discount rate

Qualifications, assumptions, and limiting conditions

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Oliver Wyman
Muellerstrasse 3
80469 Munich
Germany



Mercer
Platz der Einheit 1
60327 Frankfurt am Main
Germany

EUROPEAN PATENT OFFICE

Financial Study 2023

Deliverable 2 and 4: Strategic Financial Assessment
and Scenarios (Base Case)

29 September 2023

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List of abbreviations

AAG	Actuarial Advisory Group
ALM	Asset Liability Management
bn	Billion
CAGR	Compound Annual Growth Rate
DBO	Defined Benefit Obligation
D1	Deliverable 1 As-Is Analysis
D2	Deliverable 2 Base Case scenario
D3	Deliverable 3 Risk matrix and impact
D4	Deliverable 4 Strategic financial assessment
ECB	European Central Bank
EP	European Patent
EPO	European Patent Office
EPOTIF	European Patent Office Treasury Investment Fund
FTE	Full-time equivalent
GDP	Gross Domestic Product
HICP	Harmonised Index of Consumer Prices
IAS	International Accounting Standards
IFRS	International Financial Reporting Standards
IRF	Internal Renewal Fees
K	Thousand
LTC	Long-term care
mn	Million
MTBP	Medium Term Business Plan
NPS	New Pension Scheme
NRF	National Renewal Fees
OPS	Old Pension Scheme
p.a.	Per annum
PCT	Patent Cooperation Treaty
PGP	Patent Grant Process
PPH	Products per Head
R&D	Research and Development
RFPSS	Reserve Fund for Pensions and Social Security
S/E	Searches per Examinations ratio
SEO	Search, Examination, Opposition
SSP	Salary Savings Plan
UPP	Unitary Patent Protection
YoY	Year-on-Year

1 Context and purpose of this document

1.1 Mandate of the Financial Study 2023

The main financial objectives of the European Patent Office (EPO) consist in ensuring its long-term financial sustainability and its institutional and operational independence. As the EPO is a self-financed organisation, it is of paramount importance to regularly monitor its financial situation and review its financial management and governance in a volatile economic context. The EPO mandated Oliver Wyman and Mercer to perform an independent assessment of the EPO's current financial situation and its future evolution. This engagement follows the prior engagement of Oliver Wyman and Mercer for the Financial Study 2019.

The Financial Study 2023 addresses this mandate in three distinct phases:

Phase 1 includes an As-is analysis, which assesses the current operational and financial situation of the EPO including an assessment of the impact of the six measures that were implemented following the Financial Study 2019. Additionally, this Financial Study 2023 provides a view on future financial performance and orientations of the EPO on IFRS basis over a 20-year time horizon for one Base Case using sensitivities for relevant financial and operational parameters as well as an estimate as to whether the EPO can meet its future financial obligations. All results have been forecasted based on a proprietary financial model that has been built solely for this Financial Study. All underlying assumptions of the model and its functionality are transparent and have been discussed with and validated by key stakeholders across the EPO. The results of Phase 1 provide initial findings, but at this stage do not provide any managerial recommendations as to which actions the EPO management should take and decide to communicate to relevant stakeholders. This is the case especially for all non-financial aspects of the engagement.

Phases 2 and 3 will build on the findings of Phase 1 to propose tailored measures to ensure long-term financial sustainability. This includes a proposal for an asset-liability management strategy, containing the investment strategies for RFPSS and EPOTIF.

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1.2 Previous Financial Studies and differences from the Financial Study 2023

The first independent Financial Study was conducted in 2010 to review the EPO's financial situation and forecast its long-term financial sustainability. Its results formed the basis for reforms between 2011 and 2015, which were proposed by the EPO's senior management and approved by the EPO's member states.

As the economic environment is constantly evolving, it is necessary to frequently assess and review the reforms, as well as the evolution of the EPO's long-term financial position. This need led to additional Financial Studies in 2016 and 2019.

In 2010, the scenario analysis reaffirmed certain structural challenges to the EPO, such as rising total salary costs (comprising basic salaries and social security costs), declining equity and liquidity, and the potential need for additional funding. The 2016 study focussed on production and productivity and suggested a close monitoring of factors determining the EPO's financial situation. The study recommended that the EPO should maintain the financial performance it achieved during the period from 2011 to 2016 and prepare for the potential influences of external factors, such as the digitisation of business models and competing patent systems. Actions included the launch of the European Patent Office Treasury Investment Fund (EPOTIF) and measures to increase productivity.

The Financial Study 2019 used a proprietary financial model to forecast financial statements with a 20-year time horizon. Additionally, a comprehensive employee benefit model was built to ensure an acceptable probability of being able to pay future benefits out of available cash. Finally, the Financial Study 2019 allowed for different performances of the RFPSS and EPOTIF based on capital market scenarios and strategic asset allocation. Subsequent measures, proposed by the EPO's senior management and approved by the EPO's member states, were implemented between 2019 and 2022.

Since the Financial Study 2019, Europe has faced geopolitical, societal and economic developments including the Covid-19 pandemic, the Russian invasion of Ukraine, high inflation, and a return to a positive interest rate environment induced by central banks following the high inflation. These developments affect macroeconomic parameters and have had a significant impact on the EPO's operations (e.g., through the introduction of new working methods) and on its finances.

The Financial Study 2023 was used to independently assess the EPO's current financial situation and its evolution in the future based on a single Base Case scenario. Compared to previous Financial Studies, there was a special focus on sensitivities to financial and operational parameters to determine how robust the Base Case scenario is to changes in the operational and financial environment.

1.3 Approach

The Financial Study 2023 has been structured to provide a meaningful representation and analysis of the status quo and an assessment of sensitivities to future macroeconomic developments. The study is intended as a basis for further discussion and to support the development of risk-mitigating decisions by the EPO’s management and relevant stakeholders. Overall, the Financial Study 2023 contains the following deliverables (Figure 1).

Figure 1: Deliverables overview



As-Is Analysis: Financial and operational situation and financial measures assessment (D1)

The report includes an analysis of the EPO’s current financial and operational situation using the Financial Study 2019 and financial statements up to 2022 as starting points. To enrich the assessment, interviews with stakeholders were carried out for hypothesis testing and gap identification. The analysis is based on the same methodology as the 2019 assessment with no additional assumptions. In addition, all financial measures implemented with CA/18/20 have been assessed regarding their initial development and impact within the timeframe 2018-2022.

Risk matrix and impact (D3)

This report provides a holistic risk framework and classification for the EPO. Based on the framework potential risks to the EPO’s financial sustainability have been identified and have been evaluated in an outside-in analysis. All relevant risks for the Financial Study 2023 assessed in terms of their probability of occurrence and their financial impact. Based on this risk matrix, parameters have been identified that are relevant for the sensitivity analysis performed under the strategic financial assessment.

Strategic financial assessment (D2, D4)

The strategic financial assessment includes a financial model including simulated financial statements (D4). The operating business of the EPO is used to forecast the financial performance and orientations of the EPO with a 20-year horizon (e.g., production, workforce, revenues, salaries, investments). Parameters were defined for use in a Base Case (D2). A coverage gap or surplus is projected for 2042¹, based on the funding requirement and the available cash surplus. To determine how robust the Base Case (D2) is to changes in

¹ Coverage gap or surplus is projected for 2042 and deflated to 2022 values

the operational and financial environment, sensitivities were calculated for the parameters classified as relevant by the risk assessment.

1.4 Purpose of this document

This report describes the Base Case scenario, the modelling approach and the results of the strategic financial assessment (D2, D4). It also provides details of the evaluation of sensitivities that were determined as part of deliverable D3 (Risk matrix and impact).

The description of the Base Case scenario includes forecasts for relevant macroeconomic parameters, such as inflation and expected asset returns, as well as key operational and financial parameters. The strategic financial assessment is based on a forecast of the operational and financial figures in the context of the Base Case and includes a forecast of the balance sheet, the income statement and the cashflow statement. These incorporate projections for the RFPSS and EPOTIF together with pension payments. Cost and revenue projections are also included based on strategic workforce projections and a model of the entire production environment.

The report also includes an evaluation of sensitivities that were determined as part of deliverable D3 (Risk matrix and impact) to gauge the robustness of the financial forecasts against macroeconomic and operational changes and strategic management decisions.

All figures in this report should be understood as orders of magnitude for management information. They do not represent an accurate accounting view.

2 Executive Summary

The Strategic Financial Assessment contains an analysis of the EPO's financial situation and its evolution in the future (to a 20-year horizon). The assessment is based on the Base Case (sometimes called the "Base Case scenario"), which forms the starting point for an assessment based on a long-term projection of relevant macroeconomic and operational parameters.

The Base Case represents a best estimate of the future based on today's macroeconomic situation and management planning. Relevant parameters were diligently aligned with senior EPO stakeholders (especially from DG0, DG1 and DG4) and reflect a careful balance among the competing priorities of timeliness, the workforce and productivity. As a guiding principle, timeliness reflects the EPO's own ambition and commitment to excellent customer service and is also the direct demand from customers. It requires both institutionally set workforce targets and operationally delivered productivity developments.

The study adopts the view that timeliness and stock turnover determine target production, while examiner workforce and productivity decide the available production capacity. Deviations from the productivity pathway are compensated via the workforce and vice versa.

Key assumptions for the Base Case include:

- The examiner workforce is expected to decrease from 3 981 examiners in 2022 to 3 794² examiners in 2028 according to currently planned replacement ratios. The examiner workforce will remain stable thereafter. The remaining workforce is expected to decrease from 2 316 employees in 2022 to 2 150 employees in 2028 and remains stable thereafter.
- The productivity pathway assumes average annual productivity growth of 2.1% between 2023 and 2042, while achieving the targeted ambition of 157 products per FTE³ by 2035.
- Among macroeconomic parameters, the study assumes inflation will converge to the ECB long-term target of 2.0% by 2033. An average nominal asset return of 4.6% p.a. is assumed for the EPOTIF and RFPSS.

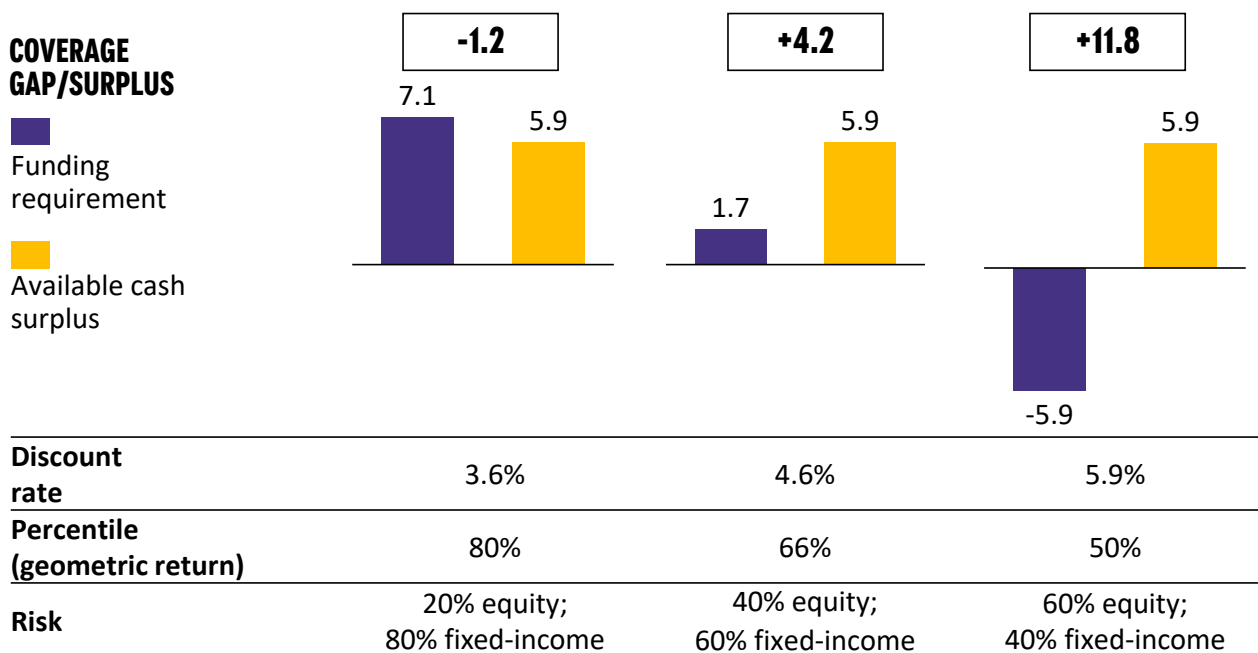
Forecasting the EPO's financial situation for the next 20 years for the Base Case shows that the EPO is now in a financially improved position with a coverage surplus of EUR 4.2 bn⁴, compared to the results from the Financial Study 2019 (see Figure 2). Furthermore, EUR 2.4 bn cash will be available between 2023 and 2028 due to the EPO's cash generating capacity from operations.

² Discrepancy of 11 examiners to medium-term business plan due to HR retirement data

³ FTEs are derived from average examiner headcount by correcting for incapacity, unpaid capacity and non-core investments

⁴ Projected for 2042 and deflated to 2022 values

Figure 2: Funding requirement⁵, available cash surplus and coverage gap/surplus in 2042, in EUR bn, deflated to 2022



Taking into account relevant financial risks with long-term financial impact, sensitivities were derived to gauge the robustness of the financial results for the Base Case against deviations from assumptions in key parameters.⁶ The study shows that the EPO is most vulnerable to decreases in the asset performances of EPOTIF and RFPSS, higher inflation and decreased productivity growth.

Key results from the sensitivity analysis:









- reasonable robustness against slight increases in incoming workload with a positive impact of EUR 1.5 bn in addition to a EUR 4.2 bn coverage surplus
- operational assumptions – which are mostly under the EPO’s control – such as productivity, workforce and timeliness if not met could negatively impact the coverage gap/surplus by up to EUR 1.6 bn
- high vulnerability to macroeconomic parameters – which are mostly outside the EPO’s control – such as to increases in inflation (up to EUR 8.8 bn negative impact on the coverage gap/surplus) or to lower EPOTIF/RFPSS returns (up to EUR 5.4 bn negative impact on the coverage gap/surplus)

Please refer to Figure 3 for details of each sensitivity.

⁵ The funding requirement consists of the benefit funding gap as in the Financial Study 2019 and additionally includes a one-year operational liquidity buffer as well as a deduction for pre-paid fees

⁶ See separate report “Risk matrix and impact” (Deliverable 3 Financial Study 2023)

Figure 3: Sensitivities on coverage surplus, in EUR bn, impact on coverage gap per sensitivity

Parameter	Sensitivity as Delta to Base Case	Coverage surplus Base Case +4.2 EUR bn		Coverage gap/surplus
Productivity in products per FTE	-1 / -2 products per FTE p.a. after 2028	-1.6 / -1.0		+2.7 - +3.3
Examiner workforce	Parallel shift +100 / +200 bps of growth rate after 2028	-1.5 / -0.7		+2.8 - +3.5
Workload	Parallel shift -20 / +100 bps of growth rate	-0.0		+4.2 - +5.7
Timeliness	Meet "Paris criteria" earlier / later	-0.7		+3.5 - +4.5
Procedural fee increases	One-time increase (2024) / biennial			+4.9 - +7.9
Internal renewal fee increases	One-time increase (2024) / biennial			+4.6 - +6.6
EPOTIF/RFPSS returns	Parallel shift -100 / +130 bps	-5.4		-1.2 - +11.8
Inflation	Parallel shift + / - 100 bps	-8.8		-4.6 - +14.5

The EPO's financial position is most susceptible to changes in parameters for capital markets, underlining the importance of continuous monitoring and steering of the EPO's financials. This requires prudent management to equip the EPO for challenging developments.

Key takeaways from the assessment of the financial situation:

- Measures implemented since 2019 have yielded impacts within the margins of expectation – significantly supported by the macroeconomic environment.
- The EPO's finances are expected to further develop favourably; however, sensitivities show a high susceptibility to capital market volatility (especially inflation) and thus impacting the development of the funding requirement.
- The vulnerabilities to macroeconomic parameters suggest a mandate for a corporate treasury with the task of hedging financial risks (inflation) and actively de-risk investments.
- The EPO should use the improved financial position to further drive operational excellence and maintain its important cash surplus.

Explicit financial risk mitigation measures will be subject to the second phase of the Financial Study 2023. However, operations should focus on quality and timeliness standards to customers, while managing internal productivity and production requirements.

3 Base Case scenario

3.1 Context and introduction

Several determinants have to be considered to assess the financial health of the EPO. The foundation of our analysis is a single scenario. Our approach and its difference from the Financial Study 2019 are explained in the following paragraphs.

Recap of the approach to the Financial Study 2019

Four financial scenarios were developed for the Financial Study 2019 to assess the EPO's financial position while considering various potential developments. As such, four distinctive narratives were developed to reflect potential future developments. These included a range of potential outcomes and were translated into input for the modelling. Baseline for all following managerial actions was the "Base 2" scenario. As a result of an interest rate sensitivity analysis an additional buffer was assumed in each scenario.

Approach to the Financial Study 2023

The key difference to the Financial Study 2019 is a focus on a single scenario. This so-called "Base Case" scenario reflects a best-estimate view of macroeconomic, operational and financial developments based on recent observations and returning to long-term historic trends. The Base Case scenario serves as the single starting point of the strategic financial assessment. Together with forecasts of key macroeconomic parameters, it includes assumptions for strategic workforce planning and operational ambition to be achieved through paths to improve timeliness and productivity. To forecast operational parameters, the Base Case is aligned to and builds on current production and management planning.

However, to assess financial vulnerability and robustness, sensitivities to relevant parameters were conducted against the backdrop of an assessment of risks⁷. This assessment was used to derive variations in key parameters that could lead to either a negative or a mitigating effect on the financial position of the EPO. These sensitivities allow for a stand-alone assessment if there are no changes in other parameters. The risk assessment allows specific parameters to be quickly adjusted without the need for a comprehensive narrative for a specific scenario.

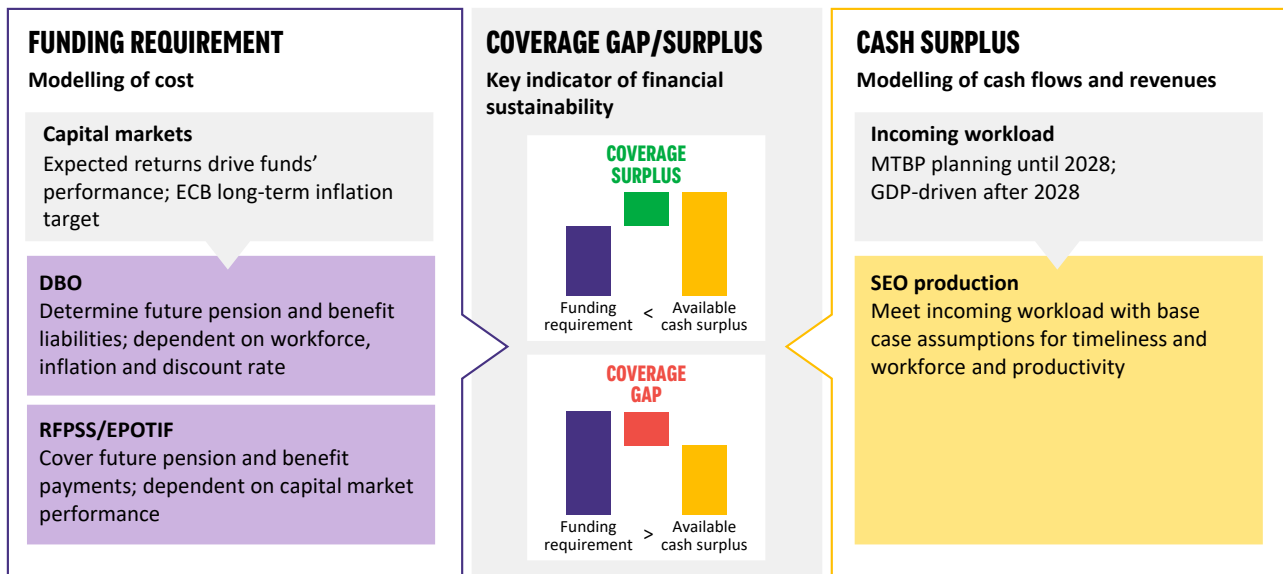
A key indicator of financial sustainability is the long-term coverage gap or surplus. As illustrated in Figure 4, the key components are the funding requirement and the available cash surplus. The former consists largely of the defined benefit obligation (DBO) and the EPO's assets in the form of the RFPSS and the EPOTIF, and it is driven by capital market assumptions. The available cash surplus is largely a result of the favourable development of patent demand, EPO's patent granting activities and is driven by operational assumptions. This means that, to evaluate the financial position of the EPO, it is necessary to model its operations too. However, the study takes an abstract and simplified view of the EPO's operational activities. This should not be understood as a prescriptive view of how the operational activities should be conducted but as a view of how the financials of the EPO will actually develop.

All aspects of the operational model and long-term operational forecasts have been closely aligned with relevant stakeholders (especially DG1). They reflect a balance between the ongoing commitment to operational excellence and SEO production requirements to achieve the self-set goals. Given the simplified nature of the operational model, the results of the Base Case projection are supported by an in-depth assessment of the sensitivities of the operational parameters.

Please note that our modelling does not have the ambition to predict the EPO's evolution on an annual basis. Rather, it aims to provide direction, strategic indications for decision making and financial impacts on a cumulative manner. Therefore, the results are shown in time buckets of five years.

⁷ See separate report "Risk matrix and impact" (Deliverable 3 Financial Study 2023)

Figure 4: Coverage gap/surplus, schematic view



3.2 Overview of scenario parameter values

This section provides an overview of the scenario parameter values that form the Base Case and a high-level summary of general modelling assumptions where applicable. The parameters of the Base Case are grouped into three categories: (1) external parameters, (2) macroeconomic parameters, and (3) internal parameters that follow different modelling paradigms:

1. External PGP parameters reflect operational parameters outside the EPO's direct control, such as incoming workload and timeliness.
2. Macroeconomic parameters are determined by external market forces or general macroeconomic developments, such as inflation and the discount rate and describe the general financial situation the EPO operates in. These are derived from current forecasts for financial markets. The nature of such parameters means that they lie almost entirely outside the EPO's control.
3. Internal parameters describe the modelling approach applied to operational parameters such as production, workforce and productivity. These are largely within the EPO's control. As such, they represent the mechanism for the translation of external and macroeconomic parameters into impacts on the EPO's financial position.

Table 1 summarises the most important parameters.

Table 1: Overview of key Base Case parameters

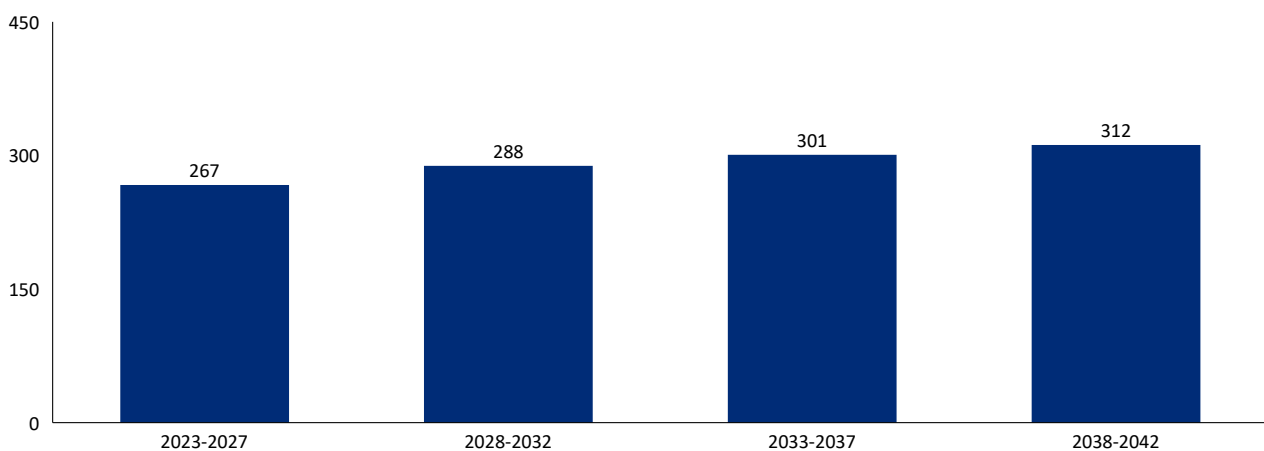
External parameters	Incoming workload	2023-2028	1.9% p.a.	<ul style="list-style-type: none"> Forecast aligned with EPO internal medium-term planning Based on long-term gross domestic product (GDP) projections for long-term forecast
		2029-2042	0.8% p.a.	
	Timeliness	2023-2042	Striving for averaging “Paris criteria” in the second half of the forecasting period	<ul style="list-style-type: none"> Only possible to satisfy “Paris criteria” for some percentage of granted patents due to regular fluctuations in the process Steady increases in Base Case over time as production capacity improves
Macroeconomic parameters	Inflation	2023-2042	2.2% p.a.	<ul style="list-style-type: none"> Matching the ECB long-term inflation target
	Risk-free interest rate	2023-2042	Decrease from 1.3% to 0.0% in 2030; constant afterwards	<ul style="list-style-type: none"> Having seen negative risk-free rates in the past, a 0% risk free rate in the long term is assumed as any return will likely be needed to be compensated by risks and for prudent planning in the financial model
	Market returns	2023-2042	Range between 3.6% and 5.9%	<ul style="list-style-type: none"> Before asset liability management (ALM) study in 2024 (Phase II of the Financial Study 2023, range reflects benchmarking asset returns under different risk and confidence levels)
	Discount rate for coverage gap/surplus	2023-2042	Range between 3.6% and 5.9%	
Internal parameters	Production	2023-2042	Search: 238k grows to 306k (+1.1% p.a.) Examination and Opposition: 130k grows to 218k (+3.2% p.a.)	<ul style="list-style-type: none"> Output factor that reflects the production necessary to balance incoming workload, timeliness and starting stock
	SEO days per examiner	2023-2042	175	<ul style="list-style-type: none"> Commitment by DG1 to be achieved through different measures, including shifting of time from classification to SEO production
	Examiner workforce growth	2023-2028	-0.8% p.a. from 3 957 to 3 794 ²	<ul style="list-style-type: none"> Until 2028, based on medium-term planning replacement ratios Ambition after 2028 to clear incoming workload with productivity increases
		2029-2042	Fixed at 3 794	
	Required products per FTE	2023-2042	+2.1% p.a. (106 products per FTE to 157 products per FTE)	<ul style="list-style-type: none"> Products per FTE is the SEO time-agnostic pathway to meet SEO production with a stable workforce
Time per product	2023-2042	Improves by +1.9% p.a. (1.83 to 1.27)	<ul style="list-style-type: none"> Improvement in time per product based on expected efficiency gains from further PGP digitisation and automatization 	

3.3 External parameters

3.3.1 Incoming workload

To stay consistent with EPO internal forecasts and procedures, the forecast for new product orders (search) for the Base Case is aligned with the EPO's medium-term business plan between 2023-2028. For the period 2029-2042, the same approach was applied as for the Financial Study 2019. A dynamic distributed lag model was used to forecast long-term demand development based on the statistical relationship between growth in incoming workload, development of real GDP and R&D stock developments.

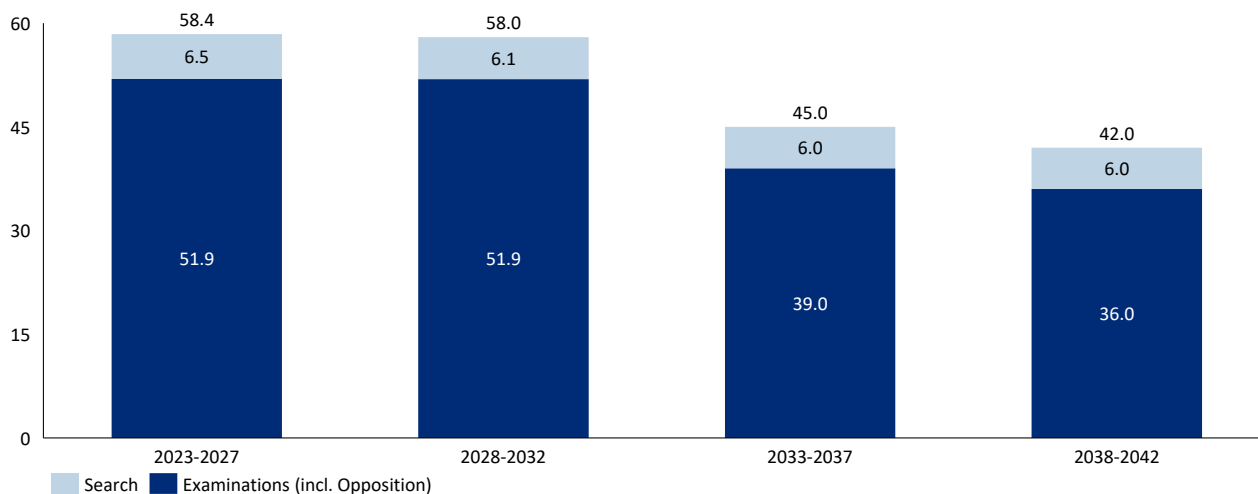
Figure 5: Incoming workload (new product orders for search), in #k, period average, 2023-2042



In summary, the Base Case assumes incoming workload growth of +1.9% p.a. between 2023 and 2028, which flattens to +0.8% p.a. from 2029 to 2042, averaging +1.1% p.a. over the entire observation period.

3.3.2 Timeliness

Timeliness is an institutionally set target, established in line with applicant expectation and the commitment of the EPO to internationally agreed criteria. For the purposes of the Financial Study, it is measured in output-months, which are calculated as the case view of pending stock at the end of a period divided by the realized production in cases during that period. For the Base Case, the timeliness targets were set to the "Paris criteria", which represents the derivation of concrete timeliness objectives by the EPO in accordance with the long-term ambition to deliver a European patent within three years from filing on average. This is represented as six output-months for Search and 36 output-months for Examinations. As illustrated in Figure 6, these targets are met in the second half of the forecasting period.

Figure 6: Timeliness, in output-months, period average, 2022-2042

It is important to note that this notion of timeliness is different from that of time to grant – i.e., the time a patent stays within the process, which is directly observable for applicants receiving a grant. Instead, timeliness in output-months is a sensitive indicator of the speed at which the current stock is processed, and it is not biased by the age structure of the current stock. If a set level of timeliness in output-months is maintained over an extended period, it will eventually converge to the time to grant. The use of timeliness is therefore warranted as an approximation for a long-term projection as conducted for the Financial Study.

The trend of timeliness in the Base Case can be interpreted as an expectation that the time to grant will increase in the near future, and then tend towards 36 months for examinations in the second decade of the projected period.

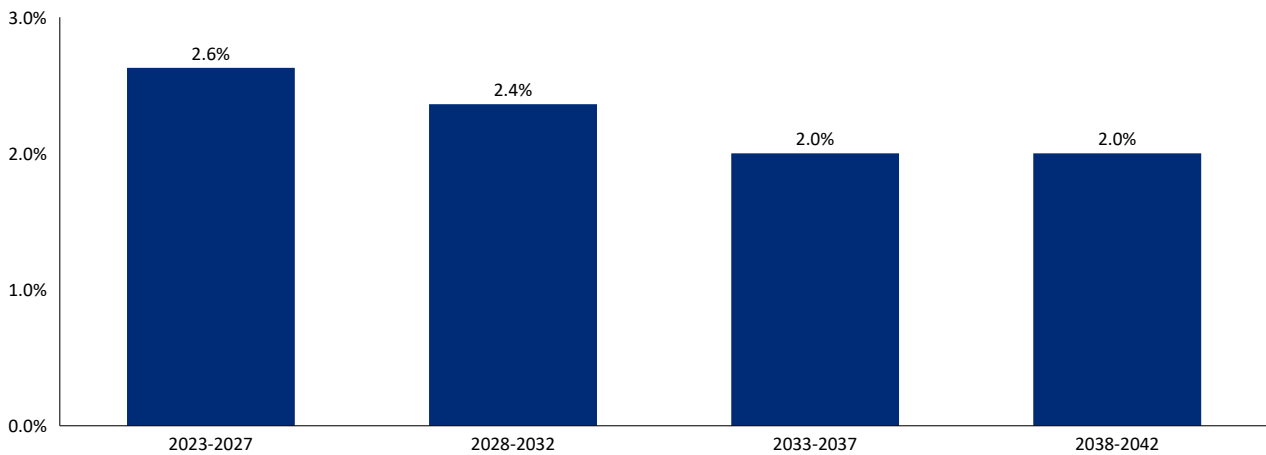
3.4 Macroeconomic parameters

Europe has faced several geopolitical, societal and economic events since the Financial Study 2019, including the Covid-19 pandemic, the Russian invasion of Ukraine, high inflation rates, and a return to a positive interest rate environment. These developments affect macroeconomic parameters and have had a significant impact on the EPO's operations and finances.

3.4.1 Inflation

Valuation inflation is an outcome of Mercer's stochastic capital market calculations. The yield spread between nominal bonds and inflation-linked bonds, swaps and other such financial market instruments is a fundamental indicator of inflation expectations. Inflation expectations for the period 2023-2042 are derived from the EUHICPX Zero Coupon Breakeven Swap Rate as of 31 March 2023, which provides a neutral market-based estimation of the Eurozone inflation rate. The average over 20 years is assumed to be 2.2% p.a.

Figure 7: Inflation, in %, period average, 2023-2042

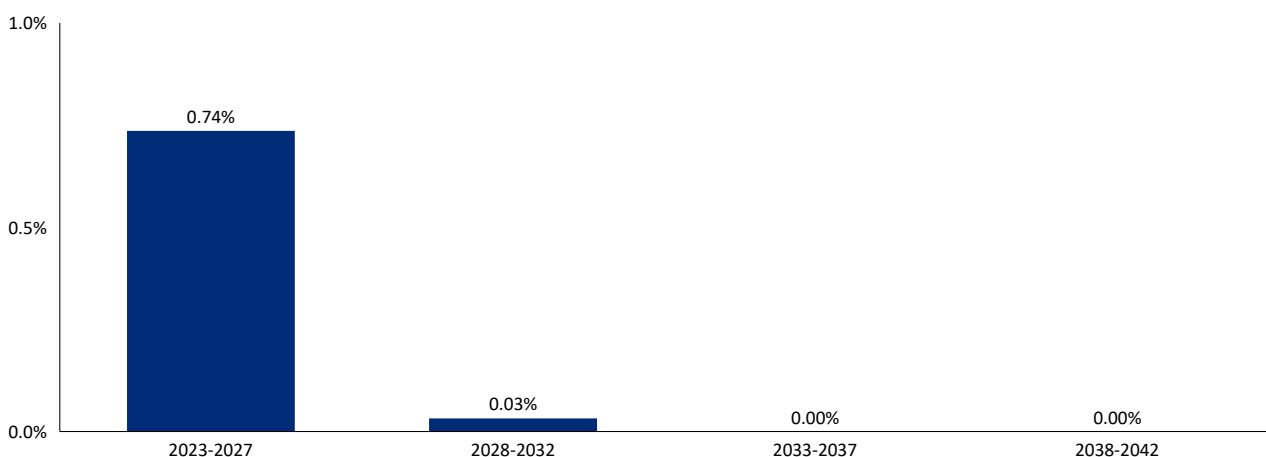


3.4.2 Risk-free interest rate

The risk-free rate is the minimum return an investor expects on any investment. Investors will not accept additional risk unless the potential rate of return is greater than the risk-free rate. The risk-free rate is typically derived from yields on government bonds with high credit ratings (risk-free government bonds). It is an outcome of Mercer’s stochastic capital market calculations.

While the current risk-free interest rate is highly elevated with cash rates above 3%, yields observable at capital markets imply that interest rates will gradually decline once inflation is back at target levels of the ECB. Central banks often try to strike a balance between controlling inflation and promoting economic growth. While we have seen negative risk-free rates in the past, we assume a 0% risk free rate in the long term as any return will likely be needed to be compensated by risks and for prudent planning in the financial model.

Figure 8: Risk-free interest rate, in %, period average, 2023-2042



3.4.3 Market returns

Market return expectations are an outcome of Mercer’s assessment and prudent modelling of the EPOTIF and RFPSS portfolios. They will be refined in the asset liability management (ALM) study in January 2024. A market return is the change in price of an asset, and it may be represented in terms of absolute price change or percentage change. The real return accounts for the effects of inflation and other external factors, while the nominal return reflects only the change in price.

Geometrically calculated returns are relevant to set a discount rate, allowing for fluctuations in markets and considering that in a cashflow negative scheme (payouts higher than inflows) the asset base is decreasing over time. Geometric returns also help to provide an estimate of the average growth rate needed to meet future obligations. Consequently, they provide an indicator to determine the appropriate investment strategy and asset allocation for the scheme's solvency and long-term sustainability.

In more detail, a variety of asset classes – including Euro-denominated Government Bonds, Emerging Market Debt, Global Credit and Global Developed Large Cap Equity – that can be expected to yield conservative return expectations for EPO funds (including the RFPSS and the EPOTIF). To substantiate the risk-return assumptions, the Mercer assessment relies on regularly updated model assumptions and on benchmarks for asset classes.

The discount rate for the Financial Study 2023 was based on conservative market return expectations for EPO assets (including those of the RFPSS and the EPOTIF), depending on risk appetite and confidence level. For the Base Case a prudent return probability of 66% is assumed (see Table 2). This yields an expected return of 4.6% p.a. in the context of the current RFPSS and EPOTIF asset allocation.

Economically 4.6% is adopted as the expected return for the assets and consequently the discount rate for the liabilities. During the sensitivity assessment of the Base Case different economic perspectives will be adopted reflecting changed return expectations, that are derived from a more conservative or aggressive risk appetite (see Table 2).

As the 4.6% discount rate is only used to assess the coverage gap or surplus, it has no direct bearing on the forecasting of the balance sheet numbers under IAS19. Pension liabilities will be restated to the discount rate of 4.6% for the purposes of computing the coverage gap or surplus.

The discount rate range is the best assumption until this range can be replaced with the results of the ALM study in January 2024.

Table 2: Expected returns of asset allocation scenarios for EPO assets

Risk Confidence level	Low Risk 20% equity 80% fixed income	Base case 40% equity 60% fixed income	High Risk 60% equity 40% fixed income
Expected arithmetic return	5.2%	5.8%	6.3%
50% percentile geometric return	5.0%	5.5%	5.9%
66% percentile geometric return	4.3%	4.6%	4.8%
80% percentile geometric return	3.6%	3.8%	3.6%

The range of portfolio allocations are based on Mercer's European Asset Allocation survey⁸. They are split by country and capture typical strategic asset allocations in Europe. Additional benchmarks are Mercer's capital market risk-return assumptions for a detailed portfolio of asset subclasses that reflect the overall risk appetite (see Table 3).

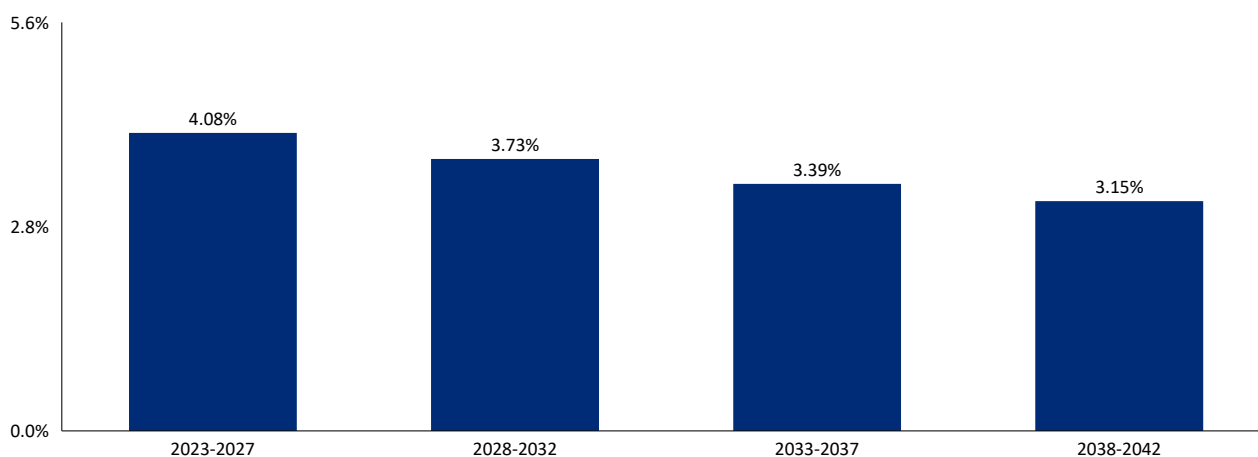
Table 3: Expected returns for EPO assets

Asset Class (excerpt)	Nominal expected return p.a. ⁹	Risk ⁹
Euro Government Bonds Broad	3.3%	7.1%
Euro Corporates Broad Index	4.0%	5.9%
Global High Yield Debt	5.4%	12.0%
Europe Large Cap Equity	6.2%	16.0%
Global Low Vol. Equity	5.0%	11.0%

3.4.4 IFRS pure discount rate

The role of the discount rate in the financial model of the Financial Study 2023 is twofold. On the one hand, it is used to provide an IFRS view of the development of the balance sheet. On the other hand, it should provide an economic view of the coverage gap or surplus. In both cases, it is used to determine the present value of future payments such as pension payments. Since pension payments have a long duration, the discount rate has a strong effect on the analysis performed in this financial study: A higher discount rate leads to lower present values of pension payments and vice versa.

Figure 9: AA discount rate, 20 years, in %, period average, 2023-2042



For purposes of the IFRS view, the AA corporate discount rate is an outcome of Mercer's stochastic capital market scenarios. It is calculated as follows:

⁸ Mercer's European Asset Allocation Survey 2022

⁹ Using capital markets assumptions as of 31 March 2023

AA corporate discount rate (nominal, 20-year duration) = risk-free rate + AA credit spread + term spread

This discount rate naturally varies from year to year and forms the basis of all the financial study's IFRS balance sheet and income statement forecasts from 2023 to 2042.

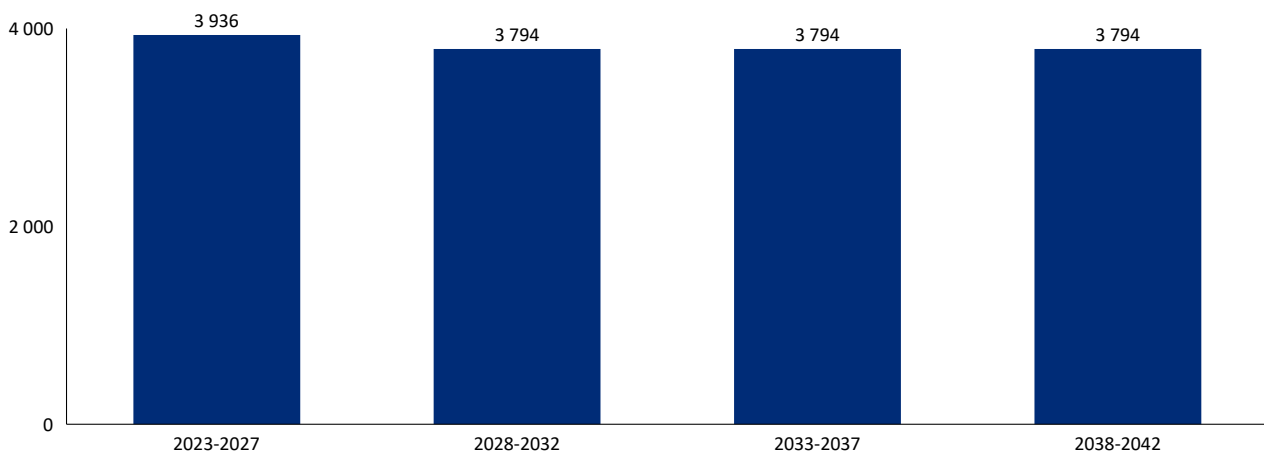
3.5 Internal parameters

The section covers key assumptions about operational parameters. These parameters are aligned with the EPO internal experts and data owners, e.g. DG1 to make sure the assumptions for the financial study are consistent with internal analyses and planning assumptions.

3.5.1 Workforce

Workforce size is a strategic management target determined through replacement ratios¹⁰. For the Base Case, the projection follows the medium-term business plan (Figure 10 illustrates the development of the examiner workforce) from 2023 to 2028 and remains at the 2028 level from then on.

Figure 10: Headcount, number of examiners, period average, 2022-2042



Three groups of employees are considered separately in the financial model: examiners, formality officers and other employees. The population of each job group is split according to whether they are affiliated to the old pension scheme (OPS) or the new (NPS) and then modelled by cluster. Retirees leave the workforce each year based on the distribution of the workforce in the previous year. New hires enter the workforce on the lowest position of the salary grid possible for their job group, and they are always affiliated to the NPS. In addition, the workforce evolves from year to year, as employees climb the salary grid based on their probability of promotion.

All employees are assumed to leave the EPO at the average retirement age of 61 years. No additional leavers apart from retirement are assumed during the time horizon of the study. Employees on fixed-term contracts are assumed to be either replaced or be prolonged and then made permanent.

For formality officers and other employees, a replacement ratio of 1 is assumed beginning in 2027. For formality officers the replacement ratio of 1 is assumed before 2027 as well, whereas other employees are assumed to be replaced at 50% before 2027.

¹⁰ Replacement ratio is defined as number of new hires in a given period of time divided by employees leaving the firm in the period

3.5.2 SEO Production

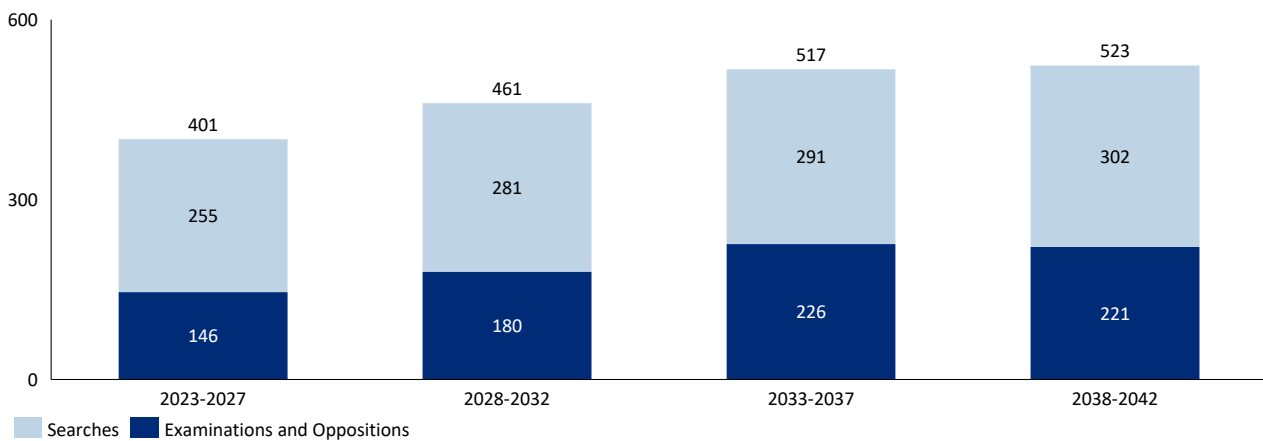
Production in the Base Case is approached from two angles: a management-oriented view referred to as the required production and an operationally oriented view of production capacity translated into production. These two views must be balanced and reflect the way in which SEO production is a function of two fundamental relationships.

Production requirement

The EPO’s long-term timeliness ambition (as measured in months of work of stock) is institutionally set based on strategic objectives centred on customer satisfaction. The incoming workload and starting level of stock thus result in a defined production of completed products, Searches, Examinations and Oppositions. This is called the production target.

Production for the 20 years covered by the Financial Study is modelled according to target production separately for Search and for Examination and Opposition. The breakdown of production into Search and Examination and Opposition is shown in Figure 11.

Figure 11: SEO production, in #k, period average, 2023-2042

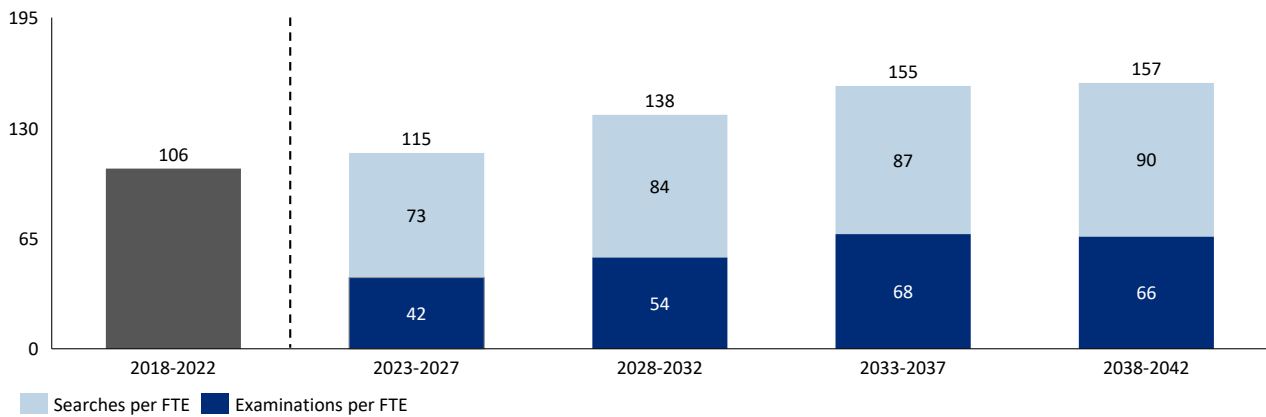


Other parameters relating to the PGP process, such as Examinations leading to patents published, are forecasted based on the interpolation of historical patterns.

Given the connection to the current level of stock, the timeliness ambition in one period impacts not only the target production in that period but also the target production in all following periods. This means that for instance front-loading the ambition for timeliness increases the short-term production target and mitigates the stock buildup, thus leading to a reduced production target in later periods.

Another consequence of this definition is that the required average products per FTE (Figure 12) is directly determined by the available workforce. In this context, the number of FTEs is established by correcting the average examiner headcount of a period by time investments for unpaid capacity, incapacity and non-core investments.

Figure 12: Productivity (required to achieve SEO production), products per FTE, period average, 2018-2042



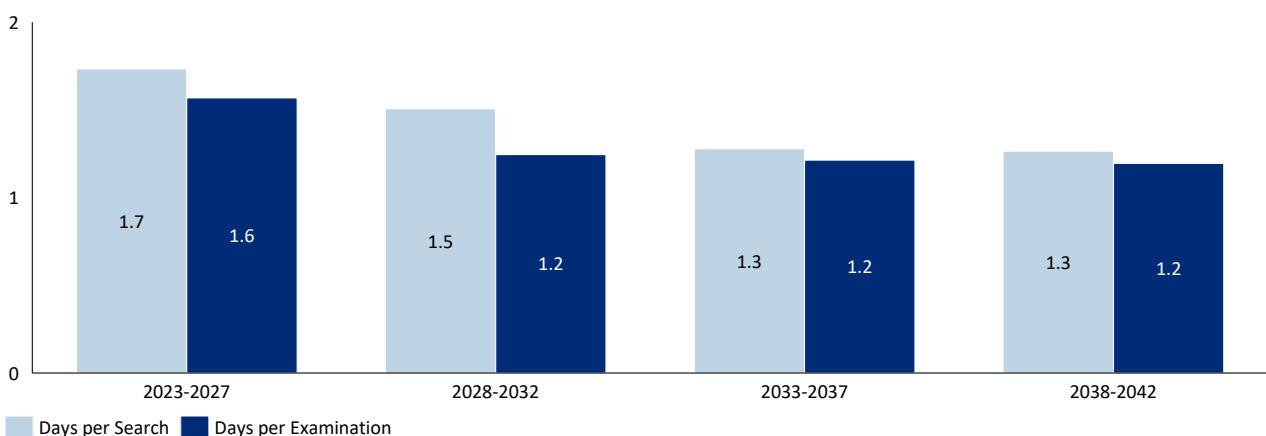
Achieving the productivity increase of 2.1% p.a. in the PGP (measured by products per FTE) is an Office wide effort that everyone will have to contribute to, e.g., by developing and providing state-of-the-art technological infrastructure and tools, fostering operational excellence across all DGs and fully leveraging flexibility through new ways of working.

Production capacity

Production capacity describes how the EPO meets its production target operationally. The Base Case assumes that production capacity will meet the production target.

The Base Case assumes that the managerially set replacement ratios for the examiner workforce (as previously outlined) are achieved, and that 175 SEO days per examiner are available to meet production needs. The time for each product (Figure 13) is assumed to shorten continuously. It is assumed that examinations experience a larger improvement, as they benefit from digitisation to a similar extent to which searches have already benefited.

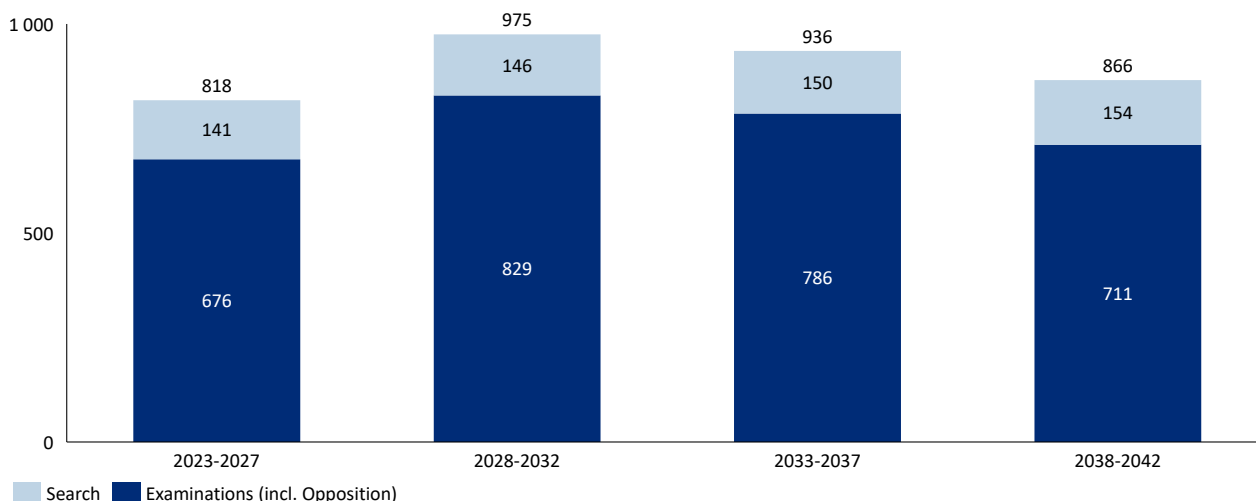
Figure 13: PGP efficiency, time per product, period average, 2023-2042



3.5.3 Stock

Stock levels are determined entirely by the starting stock, timeliness ambition and incoming workload, as already outlined. This leads to the stock development shown in Figure 14.

Figure 14: Stock (case view), in #k, period average, 2023-2042



3.6 Internal financial parameters

3.6.1 Statement of comprehensive income

The main revenue streams and employee benefit expenses are forecasted based on production and workforce development, as described in the previous section. Other operating expenses are assumed to grow with inflation. Positions with relatively small revenues and costs are assumed to grow in line with either revenue or basic salaries respectively.

Revenues from procedural fees related to the PGP

The number of cases paying fees and the fee structure, which together determine revenue from procedural fees, are modelled separately. The number of cases is forecasted based on the forecast of production figures as described in the previous section. Fees per product are forecasted based on historical income statements and production figures for individual line items, e.g. procedural fees for international searches under the Patent Cooperation Treaty (PCT). No future fee increases are assumed.

Revenue from renewal fees for patent applications

Renewal fees for patent applications (internal renewal fees, or IRF) are set depending on the age of the patent application (years since filing), as defined by the EPO. The two major drivers of revenue from internal renewal fees are the number of cases that are paying fees and the age distribution of those cases.

The number of cases currently paying internal renewal fees is modelled based on the number of pending cases (stock) for search and examination per ordinal year.

National renewal fees

National renewal fees (NRF) for granted patents are set by the member states and depend on the age of the patent application (ordinal years). The two major drivers of revenue from NRF received by the EPO are the number of patents paying fees and the age distribution of those patents. In the Base Case any net impact of the introduction of the unitary patent protection (UPP) in 2023 is deemed to be neutral.

In the financial model, NRF are modelled on the aggregate level of EPO grants, referred to hereafter as cases, not on the level of individual patents. The absolute number of cases currently paying national renewal fees is explicitly modelled for each ordinal year. Newly granted patents enter this population with an age distribution linked to the age distribution of IRF cases, and patents lapse with given maintenance rates. Maintenance rates are extrapolated for all member states based on the weighted average of the countries for which full data is available. They are assumed to be constant over time in line with historical observations. The NRF fee structure is assumed to stay constant at current levels in this Financial Study.

The increased productivity of the EPO during the PGP has two effects on the revenues from NRF: 1) The total number of cases paying NRF increases with the number of patents granted; and 2) those cases are younger on average when they first pay national renewal fees. Hence, the same cut-off in the age distribution of newly granted patents entering the NRF stock is applied to cases paying IRF. The shift in the age distribution of newly granted patents then leads to a shift in the overall distribution of patents paying NRF over time.

Employee benefit expenses

Current service cost (net of staff contributions), basic salaries of permanent employees, and healthcare and other social security costs are forecasted using detailed modelling approaches. Other employee-benefit expenses are linked to the basic salaries of permanent employees in this study.

Average salaries are assumed for employees in the two job groups 1-4 and 5-6. A further distinction is made between employees in the NPS and the OPS.

For average salaries, an annual adjustment for career progression is derived the entire workforce through the salary levels based on average promotion probabilities. In addition, an adjustment for inflation (Eurozone HICP +0.2%) is made in line with the salary adjustment method and assumptions used for IFRS accounting.

The influence of new hires on average salaries is considered explicitly. The limitations of career progression in the salary grid are reflected in average salaries.

3.6.2 Statement of financial position

Changes in major positions are either directly linked to the statement of comprehensive income or forecasted using detailed modelling approaches, e.g. for the RFPSS, the EPOTIF and DBO. Positions that are not explicitly modelled are assumed to grow in line with revenue or basic salaries.

All excess cashflow is deposited in other financial assets. One-year government-bond interest rates are used as a proxy for the return generated by cash in short-term liquidity reserves. (This is in contrast to, for example, assets in the EPOTIF, which are invested with a long-term focus).

3.6.3 Statement of cash flows

The statement of cashflows is calculated based on the statement of comprehensive income and the statement of financial position.

Operating cashflow is projected through a direct approach to better illustrate the key drivers of cash generated from the EPO's operations. The RFPSS and the EPOTIF are considered not to be part of the EPO's operations and are therefore treated as separate entities for the purpose of determining operating cashflow. The RFPSS is assumed to be activated – i.e., the benefit payments of funded plans are financed by RFPSS assets. No contributions to and no payments from the EPOTIF are assumed.

Positions in the statement of cashflows related to cash receipts from customers are forecasted based on revenue and other operating income, as calculated in the statement of comprehensive income adjusted for changes in pre-paid fees.

Positions related to cash paid to employees are forecasted based on employee benefit expenses, as calculated in the statement of comprehensive income but with the following adjustments:

- Current service cost are excluded, as they are non-cash transactions in the IFRS income statement.
- Ordinary EPO contributions to the RFPSS and the Salary Savings Plan (SSP) not explicitly considered in the IFRS income statement are included.
- Adjustments for tax allowance, family allowance and death not explicitly considered in the IFRS income statement are included.

Positions related to cash paid to suppliers are forecasted based on other operating expenses, as calculated in the statement of comprehensive income but with additional consideration of changes in assets and liabilities carried as working capital.

Positions related to investing activities are forecasted based on changes in the respective balance sheet items, whereas cashflow from financing activities is assumed to be zero from 2023-2042. As no extraordinary contribution to either RFPSS or EPOTIF is assumed over the course of the study, there are no related transactions included in the cashflow from investing activities.

3.6.4 Pension modelling approach and assumptions

Modelling of long-term employee benefits

The EPO operates four plans that are treated as defined benefit obligations (DBO):

- a retirement pension plan including retirement for health reasons, tax compensation and family allowances
- long-term care insurance
- health insurance
- lump-sum payments related to death and invalidity

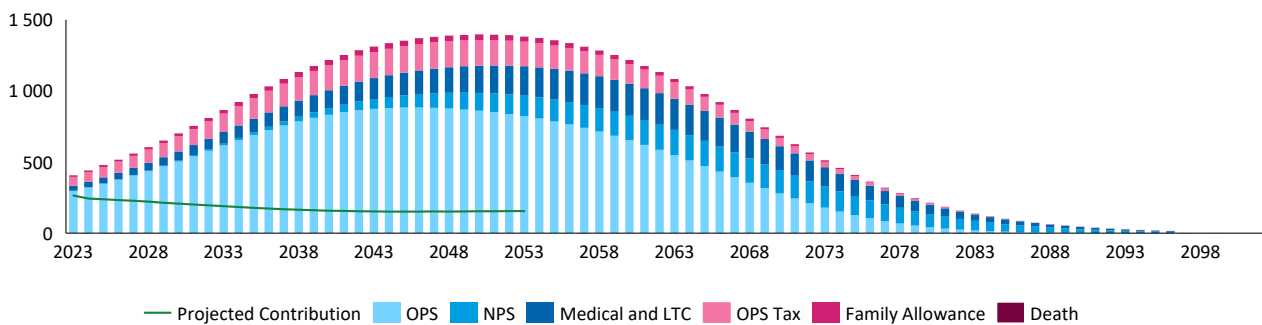
Table 4: Overview of pension modelling assumptions

Funding status	Scheme	Main characteristics
Funded Pensions	OPS and NPS	<ul style="list-style-type: none"> • OPS: staff members joining prior to 1 January 2009 (closed plan) • NPS: Staff members joining after 1 January 2009 (the relevant scheme for new hires) • 2% accrual rate per annum • 70% maximum accrual • Retirement age with no deduction: 60 • Salary cap: <ul style="list-style-type: none"> – OPS: No salary cap – NPS: Twice G1/4 salary equivalent • Pensions fully indexed to salary inflation • Contribution rates depend on pensionable salary and are set by an independent Actuarial Advisory Group
	Long-term care (LTC)	<ul style="list-style-type: none"> • Compulsory insured beneficiaries are employees, former employees and their dependent children as well as orphans receiving a pension benefit from the pension plan • The benefit amount depends on the level of reliance on care. It is a fixed percentage of basic salary • Benefits are financed by regular contributions from the EPO (two-thirds of total contributions) and employees (one-third). Contribution rates depend on salary and are set by an independent Actuarial Advisory Group
	Medical	<ul style="list-style-type: none"> • An employee, who worked at the EPO until he/ she retires or who is in receipt of an invalidity benefit, his/ her spouse, his/ her children and other dependents are entitled to a reimbursement of medical costs • Benefits are financed by regular contributions from the EPO (two-thirds) and employees (one-third). Contribution rates depend either on salary or pension payments • Current total contribution rates (to RFPSS): Application of CA/D 7/10 to the basic salaries, pensions and invalidity allowances paid • Contribution rates depend on pensionable salary and are set by an independent Actuarial Advisory Group
Unfunded	OPS Tax allowance	<ul style="list-style-type: none"> • Only beneficiaries under the OPS are entitled to the following tax compensation: 50% of the theoretical amount by which the recipient's

Funding status	Scheme	Main characteristics
		<p>pension needs to be topped up to compensate for the reduction in the pension due to national taxation</p> <ul style="list-style-type: none"> This tax compensation was previously reimbursed by the Member States in which taxes were paid. As from 1 January 2009, Member States no longer reimburse the EPO's budget for tax compensation benefits For accounting purposes, the tax allowance liability is combined with the pension plan and shown as one plan on the balance sheet. However, this means that a funded plan is in effect mixed with two unfunded plans (i.e., tax and family allowance). The tax allowance is paid directly out of operating cashflow and not deducted from the RFPSS
	Family allowance for pensioners	<ul style="list-style-type: none"> The family allowance comprises household allowance, child and dependent's allowance, disabled child allowance, childcare allowance and education allowance For accounting purposes, the family allowance liability is combined with the pension plan and shown as one plan on the balance sheet. However, this means that a funded plan is in effect mixed with two unfunded plans (i.e., tax and family allowance). Family allowance is paid directly out of operating cashflow and not deducted from the RFPSS
	Death	<ul style="list-style-type: none"> The benefit payable is a fixed amount and corresponds to 2.75 of the annual basic salary for expenses incurred for the funeral of a permanent employee himself/ herself, his/ her spouse and, where appropriate, his/ her dependents The contribution is calculated to match the (projected) annual cost of this benefit The death allowance is paid directly out of operating cashflow and not deducted from the RFPSS Benefits are financed by regular contributions from the EPO (two-thirds of total contributions) and employees (one-third)

The Base Case of the Financial Study uses cashflow projections provided by the International Service for Remunerations and Pensions (ISRP) to calculate corresponding liability and current service cost values for each year up until 2042. For this stage of the study, the cashflow projections were not verified independently. But they will be for the ALM study in January 2024.

The cashflow projections as of the last balance sheet date 31 December 2022, are shown in Figure 15.

Figure 15: Projected total cashflow current population (actives and non-actives), in EUR mn, 2023-2102

The data as delivered by ISRP assumes that the plans are closed groups, i.e., there are no new hires. The cashflows delivered by ISRP are based on the actuarial assumptions used in the IFRS actuarial valuations for the financial year ending 31 December 2022. The modelling of the schemes is therefore twofold:

- Current population of the schemes
 - The ISRP data delivery contained both accrued cashflows and full cashflows as well as the headcount of projected active employees. The difference between accrued cashflows and full cashflows is attributable to accruable future service of active participants.
 - The difference is distributed over time and the number of active employees as additional accrual (based on the initially accrued cashflows as of 31.12.2022) to determine accrued cashflows as per each balance sheet date 2023, 2024, 2025,, 2042.
 - The current service cost for each year is then calculated as the present value of the yearly accrual and DBO is calculated as the present value of the accrued cashflow of the corresponding year.
- New hires
 - ISRP data does not contain data for future new entries. New entry cashflows were calculated with Mercer's proprietary actuarial valuation software.
 - Current service cost and DBO for the new-hire population are then calculated in a similar way to the current population.
- Interest Cost
 - Interest cost is calculated directly from the DBO of the beginning of the corresponding financial year, the expected payments of the plan and the discount rate.
- Remeasurements
 - Remeasurements (for example due to a change in the discount rate or a shift from year-on-year inflation to valuation inflation) are calculated as the residual value of the forward-rolled DBO of the beginning of the year (considering current service cost, interest costs and expected benefit payments) and the DBO of the financial year end.

Please note that the OPS and OPS Tax schemes are closed to new members. Thus, modelling of new hires is relevant for the following plans:

- Retirement pension plan: NPS only
- Long-term care
- Medical insurance
- Death

3.6.5 Modelling the RFPSS and EPOTIF

RFPSS

The European Patent Office and the Reserve Fund for Pensions and Social Security Schemes (RFPSS) are structurally linked to one another. The RFPSS does not represent plan assets in terms of IAS 19.8 but provides appropriate reserves for pensions and certain areas of social security (i.e., LTC and health). Since 1984, the EPO has been setting aside reserves in the RFPSS so that it can fund its pension obligations. Since 2001, it has also been building up a reserve fund for LTC insurance, and since 2008 it has done the same for health insurance. In the IFRS statement, RFPSS assets are measured at fair value. Hence, the RFPSS's income and gains are classified within comprehensive income in the Financial Study's projections.

The RFPSS's asset allocation is derived to meet returns equal to the discount rate set by the Actuarial Advisory Group (AAG) (RFPSS Investment Guidelines, Section 2, Article I, A b)). In the latest actuarial valuation of 2023, the discount rate was set at 3.25 percentage points (pp) above the inflation rate. The AAG also recommends activating the RFPSS as a Pension Fund.

Contributions are defined for OPS, NPS, LTC and Health. The Actuarial Advisory Group, which consists of three independent actuaries, sets total contribution rates to finance future service costs for pension, LTC and Healthcare schemes. The actuarial valuation focusses on the determination of future service costs and not on funding levels or past service costs. The current (2023) total contribution rates are as follows:

- OPS: 33.60%
- NPS: 33.60%, thereof 3.3% of salary paid into a defined-contribution component (SSP)
- LTC: 1.5%

Please note that the contributions for health result from the application of CA/D 7/10 to the payment of basic salaries, pensions and invalidity allowances. The Financial Study assumes a total contribution rate of 9.90% for health. Total contribution rates for all these schemes refer to employees' basic salaries. The split is two-thirds from the EPO and one-third from the employee. In addition to regular contributions, the EPO has made significant additional contributions, which from 2012 to 2022 totalled EUR 1.7 bn.

The Financial Study assumes that the RFPSS is activated for benefit payments of funded plans: In years when contributions to the RFPSS are smaller than actual benefit payments, the net difference is paid out of RFPSS reserves.

With the introduction of the NPS and the SSP, the EPO's benefit landscape has changed significantly. Pension liabilities and contributions for new hires under the NPS are significantly lower than benefit payments for retiring OPS employees. That means lower reserves are ultimately needed in the RFPSS, while more contributions are shifted towards the SSP. Over the coming years, when a significant number of OPS employees retire, the RFPSS needs to be used for OPS payments. If, on the other hand, benefits are paid out of operating cashflow, the position becomes negative significantly sooner.

Payments for unfunded plans (tax, family allowance and death) come out of the EPO budget (there is a small reserve for OPS members tax adjustment in RFPSS). Consequently, the model assumes that they are paid out of available cash. The EPOTIF can potentially be used to pay for these benefits in the future.

To model the RFPSS's return in the financial study, these payments are entirely aligned with the discount rate chosen for the evaluation of the coverage gap/surplus to best represent the economic view. As such, the returns are set at 4.6% for the Base Case (with different risk profiles being evaluated at 3.6% and 5.9% during the sensitivity assessment).

EPOTIF

The EPO Treasury Investment Fund (EPOTIF) was established in 2018. This investment structure is set up with a Master-KVG (Kapitalverwaltungsgesellschaft – capital management company), in which the EPO holds legal ownership of the fund assets, and three external multi-asset mandates manage the fund. By the end of 2022, the EPOTIF had an asset volume of EUR 3.2 bn, and the EPO could use parts of it (some is allocated to the operational reserve of the EPOTIF) to cover long-term employee benefits of unfunded plans.

To model the EPOTIF's return in the financial study, these payments are entirely aligned with the discount rate chosen for the evaluation of the coverage gap/surplus to best represent the economic view. As such, the returns are set at 4.6% for the Base Case (with different risk profiles being evaluated at 3.6% and 5.9% during the sensitivity assessment).

4 Financial assessment of the Base Case

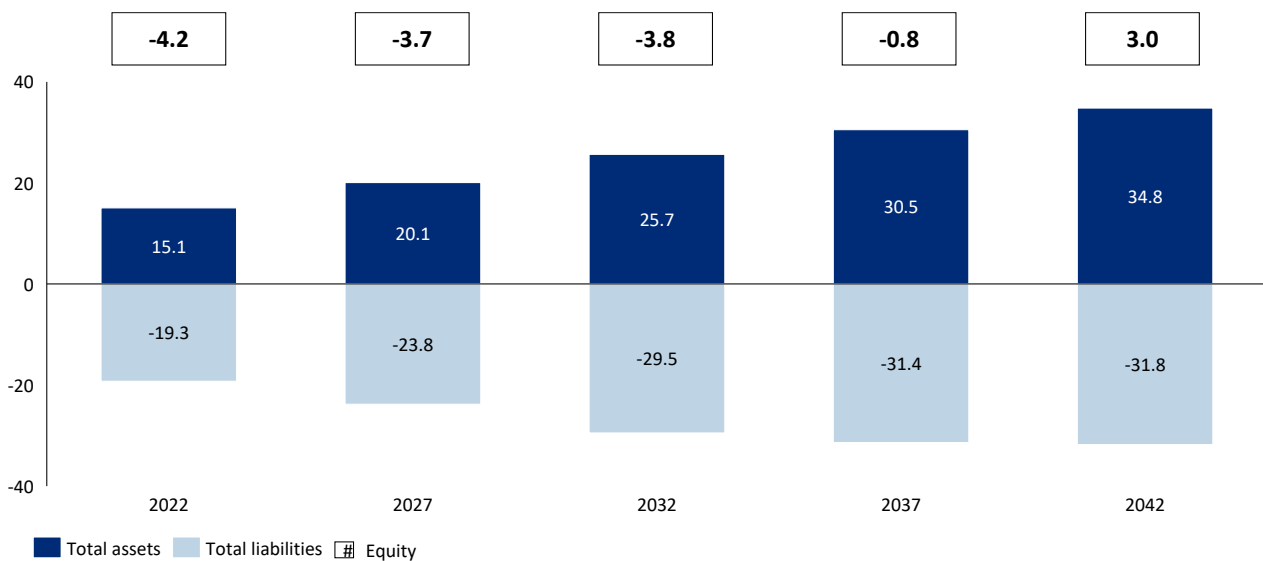
4.1 Results

The EPO’s IFRS financial statements have been forecasted for a time horizon of 20 years. This section presents trends in the EPO’s key balance sheet positions, revenue and cost components, as well as its operating cashflow. Detailed projections of the EPO’s balance sheet, its profit and loss statements and its cashflow statement can be found in Appendix A.

4.1.1 Statement of Financial Position

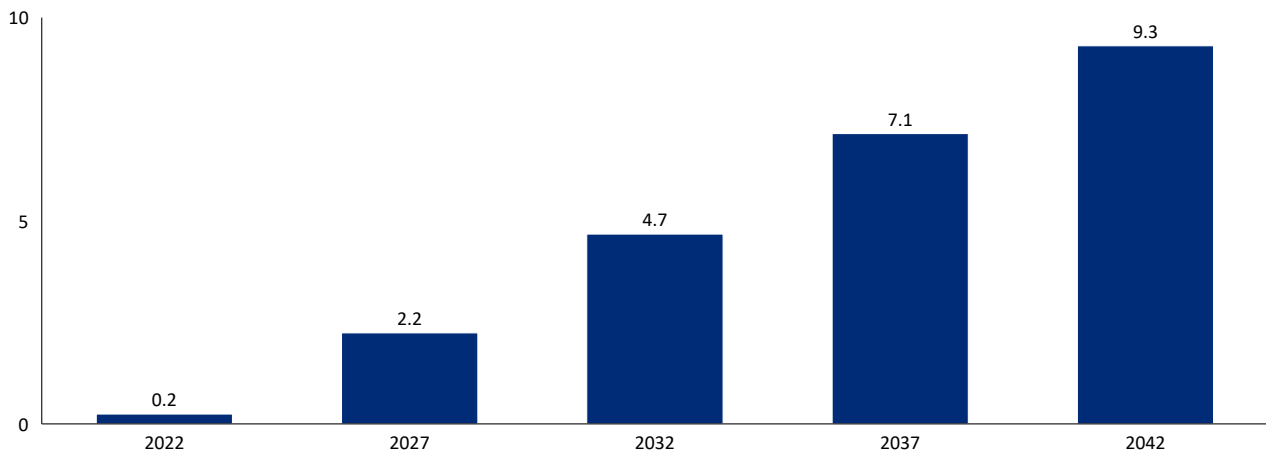
With EUR -4.2 bn as of 31 December 2022, the EPO starts out with a substantial negative equity position. Over the time period of the Financial Study, this position is projected to slowly improve until 2033, as total assets increase more steeply than liabilities. While the assets are dominated by EPOTIF and RFPSS returns, the liabilities are mostly driven by DBO developments. After 2033, the assets continue to increase at a stable rate, while there are two impacts on the liabilities, particularly the DBO. First, the shift to the ECB’s long-term inflation target of 2.0% leads to an immediate revaluation of the DBO. In addition, OPS pensioners are replaced by NPS pensioners, slowing the growth rate of the DBO. These developments are illustrated in Figure 16.

Figure 16: Key components of the Statement of Financial Position, IFRS pure, in EUR bn, nominal, 2022-2042



For the purposes of the Financial Study, it has been assumed that cash generated from operations that is not used for investing activities is recognized as other financial assets in the Statement of Financial Position, except for EUR 10.0 mn that is recognized as cash and cash equivalents. The development of these two positions, including interest earned on other financial assets, is shown in Figure 17. The position of other financial assets grows every year, which is testament to the EPO’s cash generating capability in the Base Case. Year-on-year increases slow towards the end of the 20-year forecast period, as employee benefit payments begin to increase faster than revenues.

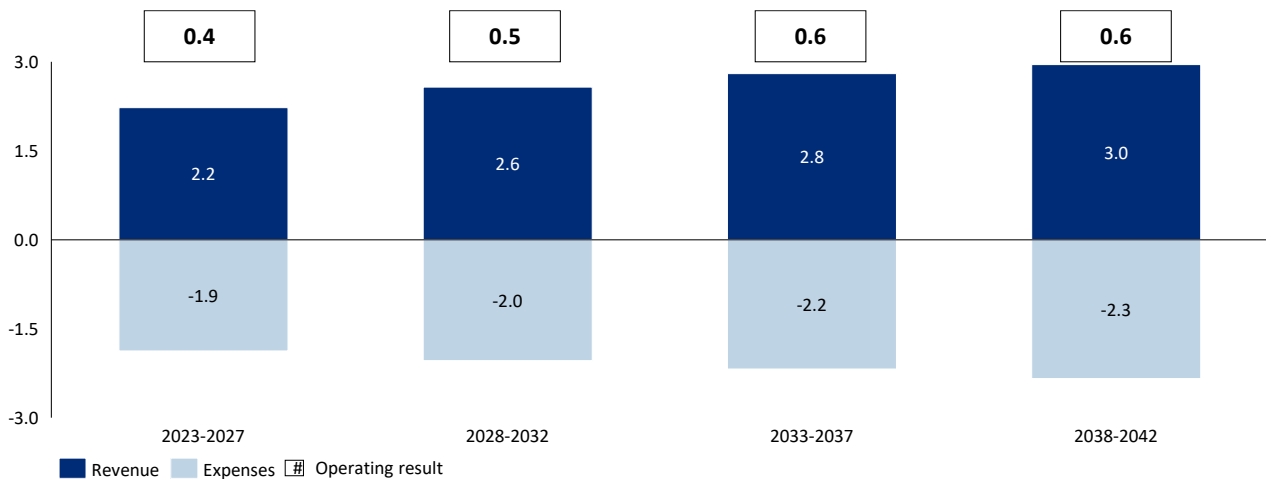
Figure 17: Cash and cash equivalents and other financial assets, IFRS pure, in EUR bn, nominal, 2022-2042



4.1.2 Statement of Comprehensive Income

The main drivers of the operating result are revenues from procedural and renewal fees, the basic salaries and allowances of permanent employees and current service cost. As illustrated in Figure 18, the operating result grows to around EUR 0.6 bn and then stabilizes for the rest of the forecast period. Due to a steady workforce in the Base Case, employee benefit expenses grow at a relatively stable rate, driven mostly by the inflation adjustment of salaries and service costs.

Figure 18: Key income statement positions, IFRS pure, in EUR bn, nominal, period average, 2023-2042

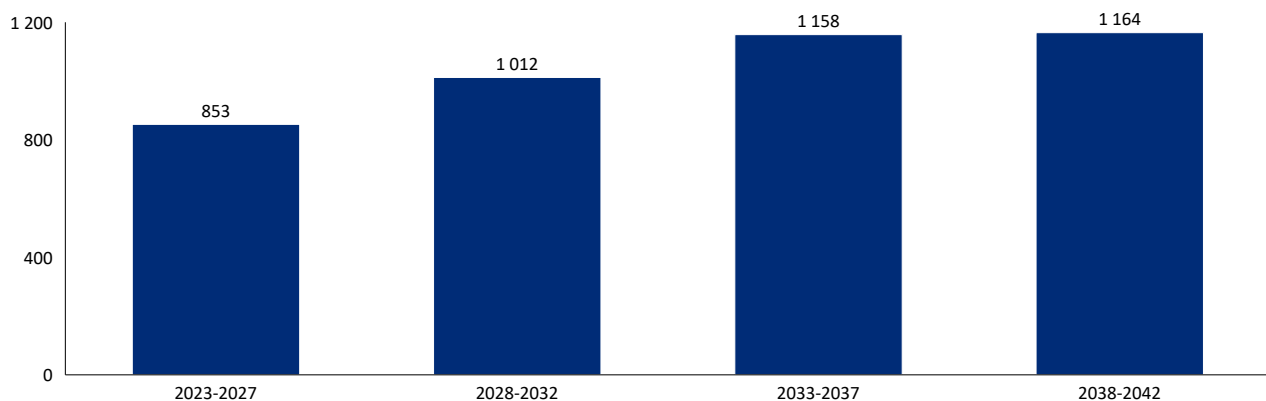


4.1.3 Development of revenue from procedural and renewal fees

Revenue from procedural fees related to the PGP

From 2023 to 2035, revenue from procedural fees (excluding internal renewal fees) increases to EUR 1.2 bn in the Base Case due to a combination of constant productivity gains and the level of incoming workload. After 2035, productivity in the Base Case is assumed to stabilize at 157 products per FTE while incoming workload continues to increase. Together with the timeliness targets, this leads to a change in the product mix of Searches and Examinations, resulting in a slight slowdown in revenue (Figure 19).

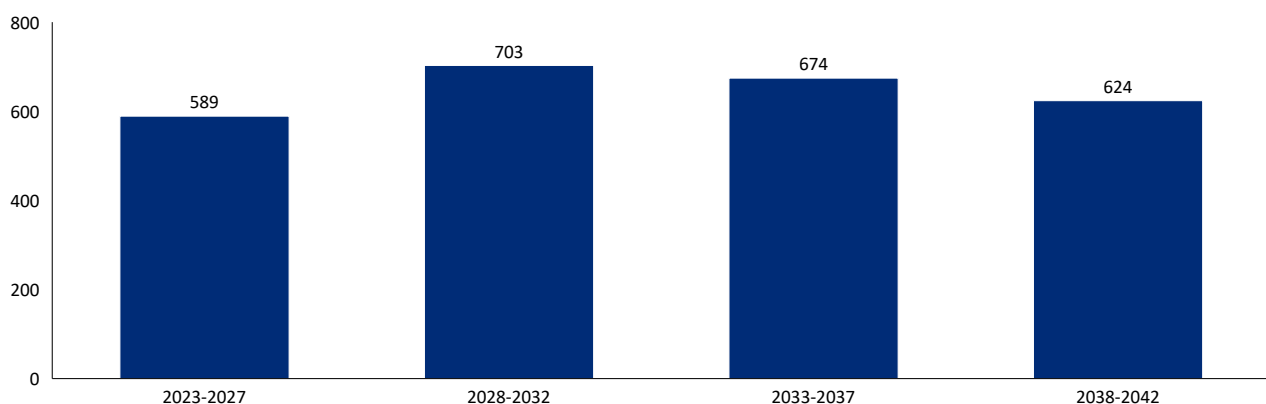
Figure 19: Revenue from procedural fees, IFRS pure, in EUR mn, period average, 2023-2042



Revenue from renewal fees for patent applications (internal renewal fees)

Revenues from internal renewal fees are determined by the number, age since filing and duration of cases in stock. Over the time horizon of the Financial Study, revenue from internal renewal fees increases until 2031 and then starts to decrease (Figure 20). This echoes the projected development of stock and the age structure entailed by the Base Case's productivity assumption.

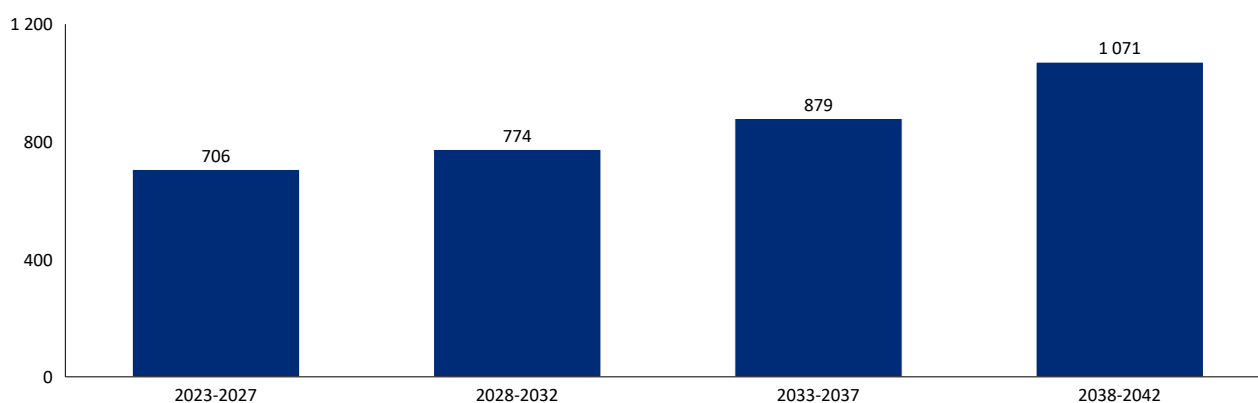
Figure 20: Revenue from internal renewal fees, IFRS pure, in EUR mn, period average, 2023-2042



Revenue from national renewal fees for granted patents

National renewal fees are less sensitive than incoming workload to changes in the macroeconomic environment in the near term: National renewal fees are paid over the lifetime of a patent, once it has been granted by the EPO. Hence, the development of revenue from national renewal fees (Figure 21) illustrates the cumulative effect of production trends. As there is a slight delay between a patent being granted and national renewal fees becoming due, the production peak in 2035 and the high production level leads to an increase in the growth of NRF starting in 2038.

Figure 21: Revenue from national renewal fees, IFRS pure, in EUR mn, period average, 2023-2042



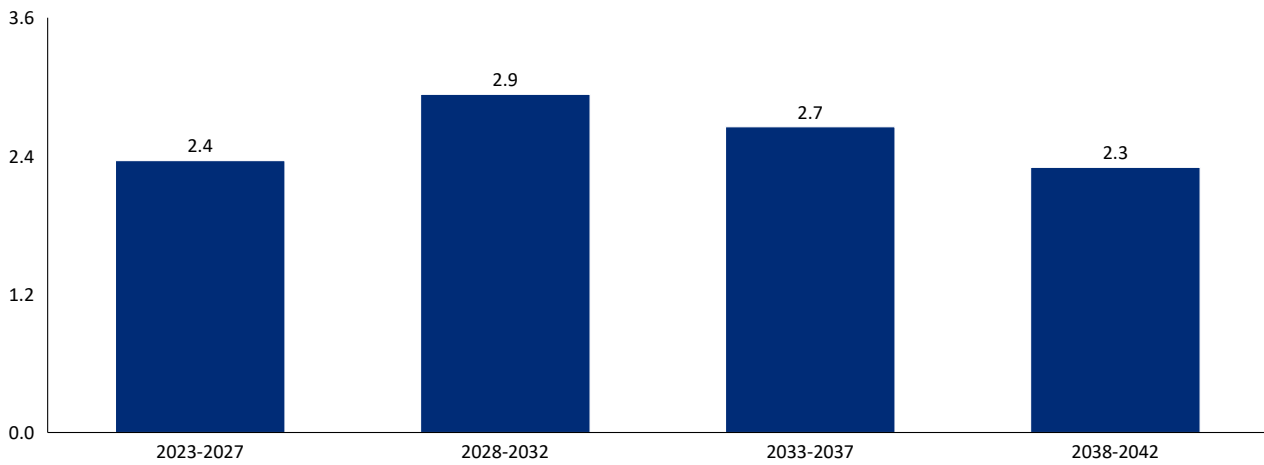
4.1.4 Statement of Cash Flows

Operating cashflow is generated from the EPO's activities related to the PGP. In this context, RFPSS is considered as a separate entity from the EPO. It is assumed that pension and social security contributions from staff and the EPO are transferred to the RFPSS, and that the RFPSS has made payments related to pensions and other benefits as of 2023.

For the purposes of this study, the direct approach to calculating the EPO's operating cashflow has been chosen over the indirect one. This was done to illustrate the effects of major financial drivers in the EPO's operations on its liquidity position.

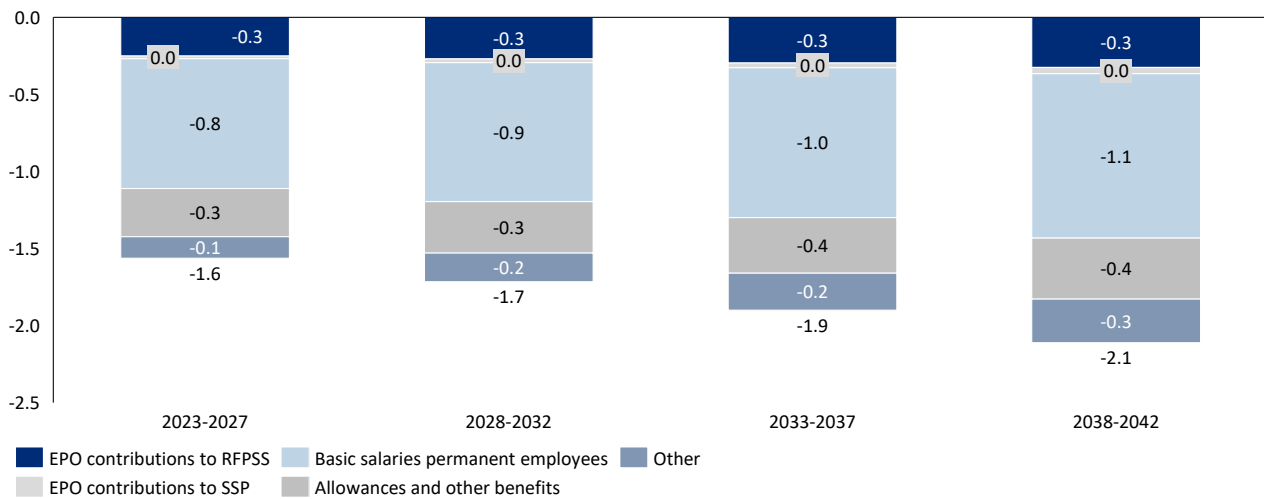
Operating cashflow increases until 2030 and then starts to exhibit a long-term downward trend (Figure 22). While the increase in employee benefit expenses starts to outpace revenue growth only in 2035, the growth in other operating costs (especially projected IT maintenance costs) causes cash outflows to increase faster than cash inflows. This illustrates that large roles in keeping revenue growth in line with employee benefit expenses were played by the continuous increase in productivity and by the resulting increase in overall production.

Figure 22: Key components of the statement of cashflows, IFRS pure, operating cashflow, in EUR bn, aggregate period cashflow, 2023-2042



Employee benefit expenses are the largest counter-position to cash inflows from operating activities. The largest employee benefit expenses positions are basic salaries for permanent employees, allowances and other benefits, EPO contributions to the RFPSS, and EPO contributions to SSP (Figure 23). Staff contributions are reflected in basic salaries. As the workforce remains stable after 2028, all increases are driven by the development of inflation and the natural evolution of the workforce through promotions, retirements, and new hires.

Figure 23: Composition of employee benefit expenses, in EUR bn, aggregate period value, 2023-2042



4.2 Coverage gap/surplus

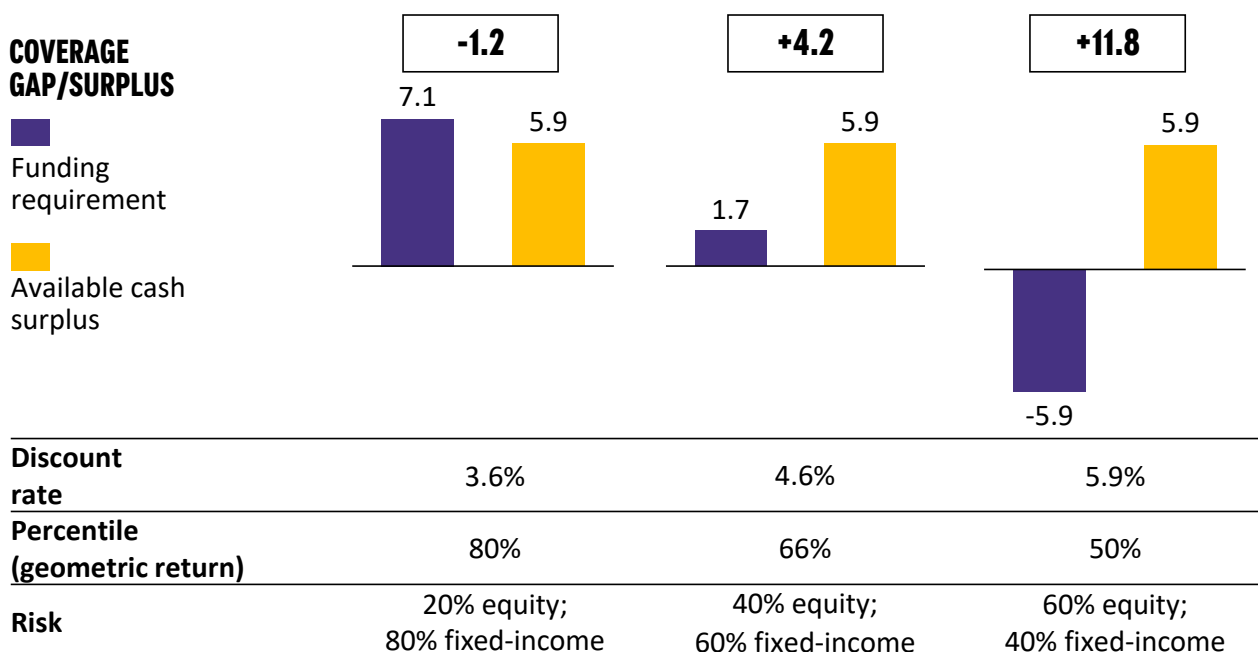
To determine the coverage gap/surplus in 2042, cashflows for each defined benefit plan (OPS, NPS, health and LTC) were rolled forward to 2042 (See chapter 3.6.4: This was done based on accrued cashflows and full cashflows provided by the IRSP as well as cashflows for new entries modelled using Mercer’s proprietary actuarial valuation software). The accrued cashflows in 2042 for each plan were then discounted with the discount rate of the funding valuation to determine the present value of the plan under a funding valuation view.

To derive the asset value at the end of a financial year, the assets of EPOTIF and RFPSS were taken at the start of each financial year. Contributions (from EPO to RFPSS and from staff) were then added and pension payments for each plan and payments to the health and LTC plans deducted. Income and gains from the investments were added at a 4.6% p.a. rate of return. In addition, the value of the assets in 2042 was deflated to 2022 terms using the forecast for inflation in the EU harmonised index of consumer prices (HICP). The same process was applied to the DBO.

Figure 24 shows the two components of the coverage gap/surplus and the result itself for three different expected asset returns/discount rates. One component is the funding requirement, which consists of the difference between benefit obligations and assets available to cover these obligations as well as a one-year operational liquidity buffer and a provision for pre-paid fees. The available cash surplus is the result of cumulated cash generated from operations less necessary investments. All figures are shown as projected for 2042 and deflated to 2022.

For expected asset returns/ discount rate of 4.6% the included operational liquidity buffer is c. EUR 1.7 bn in 2042 and deflated to 2022, whereas the deduction for pre-paid fees is c. EUR 0.6 bn.

Figure 24: Funding requirement, available cash surplus and coverage gap/surplus in 2042, in EUR bn, deflated to 2022



For two of the three discount rates chosen in the range (and for the corresponding returns on both the EPOTIF and the RFPSS), the EPO is working with a coverage surplus. Only the lowest of the three return expectations/ discount rates yields a coverage gap, of EUR -1.2 bn.

It is important to note that the coverage surplus turns into a coverage gap (funding requirement starts to exceed the available cash surplus) at a discount rate of around 3.8%. In view of the ALM study in Phase two of the Financial Study 2023 and of potential measures addressing sensitivities there is room for two types of measures: adjustment of the strategic asset allocations of both the RFPSS and the EPOTIF; and the introduction of other measures that might decrease long-term return expectations without threatening the positive outlook of the coverage gap/surplus.

5 Sensitivity assessment

This section describes the sensitivity assessment that was conducted on the Base Case in order to gauge the robustness of the results presented for the Base Case. It is important to note that the sensitivity assessment was conducted under the guiding paradigm of the Base Case, meeting the production target established through the timeliness targets. This means that, in the context of the sensitivity assessment, all deviations in required production and/ or production capacity are compensated by other parameters on the side of production capacity – i.e., increasing the examiner workforce to cope with an increased incoming workload. All other parameters are treated as stand-alone sensitivities.

In this sense, while parameters chosen for the sensitivity assessment were derived from the previous risk assessment, the sensitivity assessment is a partial quantification of the associated risks. But it is not on its own a comprehensive quantitative risk assessment.

5.1 Results of risk assessment

One key outcome of the risk assessment is a breakdown of individual drivers of key strategic and financial risks that have been assigned a risk severity based on an initial comprehensive risk assessment. Overall, 11 relevant financial risks were identified:

1. Workforce undercapacity
2. Workforce overcapacity
3. Reduction in patent demand
4. Low productivity growth
5. Low revenue through internal pricing/ fee strategy
6. Increased stock
7. Failed timeliness ambitions
8. Decrease in interest rate
9. Increase in inflation
10. Underperformance of equity market
11. Underperformance of assets

For details please see report “Risk matrix and impact assessment” (Deliverable 3 Financial Study 2023).

5.2 Summary

The sensitivities assessed broadly fall into three categories based on the parameters that are affected: internal production sensitivities – i.e., those sensitivities expressed through operational parameters that remain largely within the EPO’s own control, such as productivity and workforce trends; external production sensitivities – i.e., sensitivities that impact the EPO’s operational parameters and production but remain outside the organisation’s direct control, such as incoming workload; and macroeconomic sensitivities – i.e., sensitivities that do not affect the EPO’s production directly and are determined by external market forces or general macroeconomic developments.

It can be seen from Figure 25 that macroeconomic sensitivities have the greatest potential to affect the EPO’s financial position: The impact of changes in inflation on the coverage gap/surplus ranges from EUR -8.8 bn to EUR 10.2 bn. The second largest effect is observed for asset return (and thus discount rate)

sensitivities: between EUR -5.4 bn and EUR 7.6 bn. This accords with observations made in the As-Is Analysis (D1): The improvement in the equity position between 2018 and 2022 was attributable largely to a shift in the IFRS discount rate. Both the externally driven parameters cause an impact on the coverage gap/surplus many times larger than do operational sensitivities. From operational sensitivities, the largest negative impact, of EUR -1.6 bn, comes from no further productivity improvements after 2028 and the resulting mitigating examiner workforce growth 2028.

The asset return sensitivity and inflation sensitivity have been evaluated *ceteris paribus* to isolate the impact of each sensitivity.

Unless otherwise specified, the coverage gap/surplus has been evaluated at a discount rate of 4.6%.

Figure 25: Sensitivity assessment

Parameter	Base Case	Sensitivity as Delta to Base Case	Coverage gap/surplus (in EUR mn)	Difference compared to the Base Case (in EUR mn)	
Productivity in products per FTE	max. 157 products per FTE	-1 products per FTE p.a. after 2028	2 675	-1 561	(-37%)
		-2 products per FTE p.a. after 2028	3 263	-973	(-23%)
Examiner workforce	Fixed at 3 974 after 2028	Parallel shift +100 bp of growth rate after 2028	3 534	-702	(-17%)
		Parallel shift +200 bp of growth rate after 2028	2 766	-1 470	(-35%)
Workload	MTBP Upper	Parallel shift +100 bp of growth rate	5 741		1 504 (+36%)
		Parallel shift -20 bp of growth rate	4 208	-29	(-1%)
Timeliness	"Paris Criteria" by 2039	Meet "Paris criteria" earlier (first quarter of forecasting period)	3 495	-742	(-18%)
		Meet "Paris criteria" earlier (first half of forecasting period)	3 728	-508	(-12%)
		Meet "Paris criteria" later (end of forecasting period)	4 453		216 (+5%)
Procedural fee increases	+0.0% p.a.	One-time increase (+5.0% in 2024)	4 852		616 (+15%)
		Biennial inflation based	7 931		3 694 (+87%)
Internal renewal fee increases	+0.0% p.a.	One-time increase (+5.0% in 2024)	4 635		398 (+9%)
		Biennial inflation based	6 645		2 408 (+57%)
EPOTIF/RFPSS returns	4.6%	Parallel shift -100 bps	-1 198	-5 435	(-128%)
		Parallel shift +130 bps	11 801		7 565 (+179%)
Inflation	2.2% (average)	Parallel shift -100 bps of year-on-year inflation	14 466		10 229 (+241%)
		Parallel shift +100 bps of year-on-year inflation	-4 607	-8 843	(-209%)

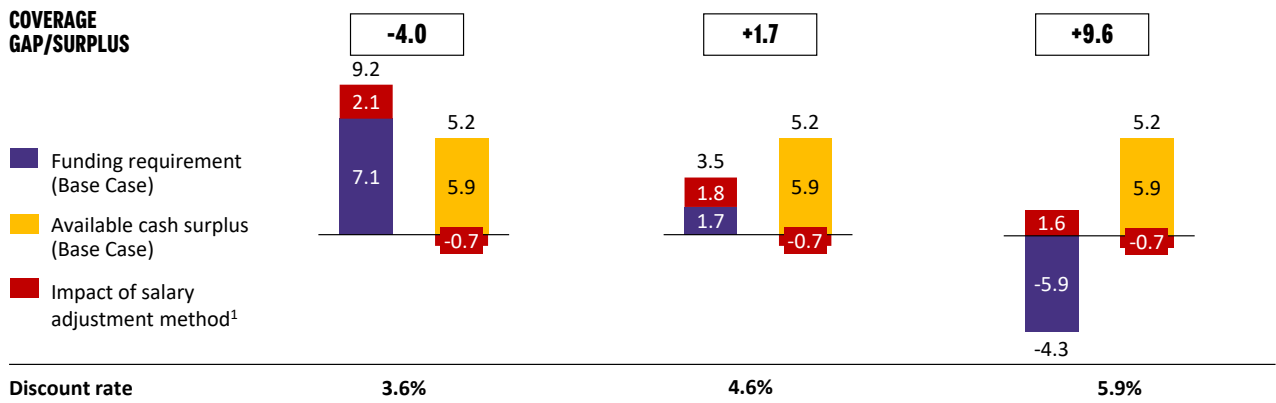
 Positive impact on coverage gap/surplus
  Negative impact on coverage gap/surplus

5.3 Deep dive: adjusted method for collective salary adjustments

Because the EPO’s financial position was demonstrated to be sensitive to inflation shifts, the effects of the adjusted method for collective salary adjustments were evaluated. The evaluation was conducted by reverting the salary adjustment method to its pre-2020 state as of the beginning of the forecasting period. As illustrated in Figure 26, the EPO would still be in a financially improved position, albeit of a reduced magnitude, with a coverage surplus of EUR 1.7 bn for a discount rate of 4.6%. Nevertheless, the funding requirement would be between EUR 1.6 bn and EUR 2.1 bn higher depending on the discount rate, while the available cash surplus would be EUR 0.7 bn lower (independent of the discount rate). The biggest difference is that under these conditions the funding requirement starts to surpass the available cash surplus at a discount rate of about 4.3%.

It is likely that envisaged measures for securing future pension payments – i.e. the introduction of a Liability-driven investment (LDI) strategy derived from an ALM study in Q1/2024 and the introduction of an inflation hedging strategy – will reduce expected asset returns. Since the expected asset returns are used as the discount rate, the discount rate will also change. This illustrates that adopting the adjusted method for collective salary adjustments in 2020 has created a space for the EPO to act decisively.

Figure 26: Funding requirement, available cash surplus and resulting coverage gap/surplus in 2042, Base Case with method for collective salary adjustments in place until 2020, in EUR bn, deflated to 2022



6 Summary of scenario results and sensitivity assessment

The study results contain the following key messages:

Measures implemented since 2019 have yielded impacts within the margins of expectation – significantly supported by the macroeconomic environment. The EPO has enacted several measures based on the results of the Financial Study 2019, and initial benefits have materialised already. In line with expectations, the measures (together with the macroeconomic environment) noticeably improved the EPO's financial situation. The implementation of the adjusted method for collective salary adjustments played the key role in providing the EPO with the financial flexibility it needs now to avoid maintaining only a very small and vulnerable coverage surplus or a coverage gap.

The EPO's finances are expected to further develop favourably; however, sensitivities show a high susceptibility to capital market volatility (especially inflation) and thus impacting the development of the funding requirement. The EPO's financial situation is projected to further improve with about EUR 2.4 bn in cash available over the next five years. This results from the EPO's cash generating capacity on one side and the weight of the EPO's pension liabilities on the other. Applying a 4.6% discount rate and the Base Case assumptions suggests that the EPO will likely have a coverage surplus of EUR 4.2 bn.

The sensitivity assessment highlights that the favourable outlook remains even in the face of operational or external challenges, even though such challenges reduce the coverage surplus. However, the EPO's financial position has significant vulnerability due to the macroeconomic environment. It is evident that this sensitivity to external factors should be carefully managed, controlled and, if necessary, mitigated to protect the currently favourable financial position. To establish the necessary processes and increase its resilience to capital market volatility, the EPO can leverage both the projected cash surplus and the margin required for asset returns.

The vulnerabilities to macroeconomic parameters warrant special attention for a corporate treasury mandate allowing to hedge financial risks (inflation) and actively de-risk investments. The EPO should consider the introduction of a central risk-management function for financial risks and exposures. This would include management of the EPOTIF's operational liquidity. Such a function should determine risk appetite and identify, quantify and prioritize relevant financial (and operational) risks. Ultimately, it should evolve into continuous, day-to-day risk management requiring a clear mandate and position in the organisation.

The Office should use the improved financial position to further drive operational excellence and maintain the pivotal cash surplus. Operational assumptions for the Base Case have been closely aligned with DG1 for the long-term projection to reflect medium-term managerial planning and long-term commitments to timeliness targets. The projection thus provides a best-estimate view of the EPO's future production and cash generating capability. Even though capital market volatility threatens the EPO's financial situation on a larger scale, the operationally generated cash surplus plays an important role in securing the positive financial outlook. To realise the long-term commitment to timeliness and production targets and thus arrive at the forecasted results, the EPO should leverage the proceeds of its operational activities to further drive operational excellence.

A. IFRS financial statements 2020-2042

Table 5: Statement of comprehensive income

In EUR mn	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Position	actual	actual	actual	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast
Operating result																							
Renewal fees for patent applications	442.3	434.3	467.6	534.0	562.8	589.7	614.6	644.6	675.0	695.8	710.4	716.8	715.5	707.3	692.6	672.2	656.0	643.1	633.4	626.4	622.2	620.1	619.5
Procedural fees related to the patent grant process	870.3	796.8	774.1	766.3	829.1	865.1	891.1	911.8	932.2	982.8	1 011.5	1 048.9	1 084.7	1 118.4	1 149.8	1 178.9	1 172.2	1 168.9	1 165.7	1 163.9	1 161.8	1 162.2	1 164.2
National renewal fees for granted patents	597.6	640.7	663.1	692.8	706.5	692.8	718.8	731.9	744.1	758.3	772.8	787.8	804.6	824.1	846.2	874.5	906.2	942.7	983.2	1 028.1	1 071.6	1 115.6	1 155.1
Revenue from patent and procedural fees	1 910.2	1 871.9	1 904.8	1 979.4	2 084.7	2 161.4	2 224.4	2 288.3	2 351.2	2 406.9	2 494.6	2 553.5	2 604.9	2 649.8	2 688.7	2 725.6	2 734.5	2 754.8	2 782.3	2 818.4	2 855.7	2 897.8	2 938.8
Other revenue	70.1	64.1	66.8	68.0	61.7	62.4	62.9	63.5	63.7	65.9	65.9	66.4	67.1	67.7	68.4	69.0	69.5	70.0	70.5	71.1	71.7	72.3	72.9
Other operating income	6.0	6.3	15.1	15.0	15.7	16.3	16.7	17.2	17.7	18.3	18.7	19.2	19.6	19.9	20.2	20.5	20.5	20.7	20.9	21.2	21.4	21.7	22.0
Work performed and capitalised	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Current service cost (net of staff contributions)	-1 071.5	-1 004.7	-809.6	-308.6	-321.3	-309.2	-319.4	-328.0	-335.5	-343.7	-351.7	-358.2	-367.5	-376.7	-334.9	-333.0	-332.3	-334.2	-347.5	-341.6	-336.5	-332.2	-328.9
Basic salaries permanent employees	-755.1	-755.2	-742.7	-815.7	-834.5	-842.9	-857.0	-864.4	-872.7	-886.8	-900.7	-916.1	-931.3	-943.3	-956.3	-970.4	-985.7	-1 002.6	-1 021.4	-1 042.1	-1 064.5	-1 088.6	-1 114.5
Allowances and other benefits	-315.1	-261.1	-185.9	-302.1	-309.1	-312.2	-317.4	-320.2	-323.3	-328.5	-333.6	-339.3	-345.0	-349.4	-354.2	-359.4	-365.1	-371.4	-378.3	-386.0	-394.3	-403.2	-412.8
Healthcare and other cost of social security	-28.6	-31.6	-36.0	-24.4	-25.8	-25.8	-26.2	-26.4	-26.8	-27.6	-28.4	-29.4	-30.3	-31.2	-32.0	-32.8	-33.6	-34.3	-35.0	-35.7	-36.4	-37.0	-37.6
Other	-54.8	-54.4	-41.3	-44.0	-45.0	-45.5	-46.2	-46.6	-47.1	-47.9	-48.6	-49.4	-50.3	-50.9	-51.6	-52.4	-53.2	-54.1	-55.1	-56.2	-57.4	-58.7	-60.1
Employee benefit expenses	-2 225.1	-2 107.0	-1 815.5	-1 494.9	-1 535.7	-1 535.6	-1 566.3	-1 585.7	-1 605.4	-1 634.3	-1 663.0	-1 692.4	-1 724.3	-1 751.4	-1 729.0	-1 747.9	-1 769.8	-1 796.6	-1 837.3	-1 861.6	-1 889.1	-1 919.8	-1 954.0
Depreciation and amortisation expenses	-65.9	-69.9	-64.5	-55.2	-52.3	-50.7	-51.3	-56.3	-59.7	-58.5	-59.6	-61.9	-70.2	-74.1	-74.0	-69.9	-66.2	-62.9	-59.8	-56.9	-54.3	-51.9	-49.8
Other operating expenses	-231.7	-263.2	-251.7	-263.1	-269.2	-275.5	-281.8	-288.1	-294.6	-301.3	-308.3	-316.0	-323.8	-330.3	-336.9	-343.6	-350.5	-357.5	-364.7	-372.0	-379.4	-387.0	-394.7
Operating result	-536.4	-497.8	-145.0	249.1	304.8	378.3	404.6	439.0	472.9	526.9	548.4	568.7	573.2	581.6	637.4	653.6	637.9	628.5	612.1	620.2	626.0	633.1	635.2
Financial result																							
Income and gains on RFPSS assets (net)	422.6	1 343.6	-1 630.4	479.8	501.0	521.6	541.9	561.8	581.1	599.7	617.6	634.6	650.5	665.2	678.5	690.6	701.4	710.9	719.2	726.4	732.4	737.6	741.8
Income and gains on EPOTIF assets (net)	0.0	0.0	0.0	148.6	155.5	162.6	170.1	177.9	186.1	194.6	203.6	213.0	222.8	233.0	243.7	254.9	266.7	278.9	291.8	305.2	319.2	333.9	349.3
Interest income from bank accounts and deposits	0.0	0.0	1.2	1.0	6.0	7.0	6.2	4.8	3.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	140.9	267.1	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance revenue	563.5	1 610.7	-1 599.1	629.5	662.5	691.2	718.2	744.5	770.5	794.7	821.2	847.6	873.3	898.2	922.3	945.6	968.1	989.9	1 011.0	1 031.5	1 051.7	1 071.5	1 091.1
Interest costs on defined benefit obligations	-336.8	-265.8	-360.6	-732.6	-782.1	-772.4	-791.5	-814.0	-838.5	-863.8	-889.2	-920.5	-938.5	-958.5	-918.1	-923.2	-924.6	-920.7	-900.9	-905.0	-907.6	-908.9	-908.9
Other	-6.2	-32.9	-498.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance costs	-343.0	-298.7	-858.8	-732.6	-782.1	-772.4	-791.5	-814.0	-838.5	-863.8	-889.2	-920.5	-938.5	-958.5	-918.1	-923.2	-924.6	-920.7	-900.9	-905.0	-907.6	-908.9	-908.9
Financial result	220.5	1 312.0	-2 458.0	-103.2	-119.6	-81.3	-69.5	-68.0	-69.1	-68.0	-72.9	-65.2	-60.3	4.2	22.3	43.5	69.2	110.1	126.6	144.1	162.6	182.2	
Profit (loss) for the year	-315.9	814.2	-2 603.0	145.9	185.2	297.0	331.3	369.4	404.9	457.8	480.4	495.8	508.0	521.3	641.6	675.9	681.4	697.6	722.2	746.8	770.1	795.7	817.4
Remeasurement defined benefit obligations	3 941.4	10 536.5	-289.1	471.6	-308.2	-358.7	-359.0	-371.1	-424.2	-436.3	-598.2	-601.0	1 412.5	-230.5	-272.3	-357.3	-747.3	17.7	18.7	19.5	20.2	20.8	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total comprehensive income for the year	3 625.5	11 350.7	-2 892.0	617.5	-123.0	-61.7	-27.7	-1.7	-19.3	21.5	-117.8	-105.2	1 920.5	290.8	369.3	318.6	-66.0	715.4	740.9	766.3	790.2	816.5	817.4

Table 6: Statement of financial position

in EUR mn	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Position	actual	actual	actual	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast
Assets																							
Property, plant and equipment	692.2	651.8	633.0	595.7	575.3	581.6	641.4	681.3	665.7	678.6	705.4	805.0	851.4	849.0	798.8	752.7	710.4	671.6	636.0	603.3	573.3	545.7	520.5
Intangible assets	31.3	31.6	38.7	40.4	41.4	42.3	43.3	44.3	45.3	46.3	47.4	48.6	49.8	50.8	51.8	52.8	53.9	54.9	56.0	57.2	58.3	59.5	60.7
RFPS net assets	10 342.8	11 867.9	10 430.7	10 911.3	11 372.3	11 826.6	12 274.4	12 710.4	13 132.7	13 540.0	13 928.9	14 295.5	14 635.7	14 946.6	15 229.5	15 483.7	15 709.1	15 906.2	16 077.0	16 223.5	16 347.7	16 451.2	16 536.0
Bonds	3 137.9	3 620.5	3 230.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPOTIF (current+non-current)	3 137.9	3 620.5	3 230.8	3 379.4	3 534.8	3 697.4	3 867.5	4 045.4	4 231.5	4 426.1	4 629.7	4 842.7	5 065.5	5 298.5	5 542.2	5 797.2	6 063.8	6 342.8	6 634.5	6 939.7	7 259.0	7 592.9	7 942.1
Home loans to staff	91.9	89.9	86.7	90.1	94.4	97.8	100.6	103.5	106.3	110.1	112.7	115.3	117.6	119.6	121.3	123.0	123.4	124.3	125.5	127.1	128.8	130.7	132.5
Other financial assets	0.0	0.0	80.0	60.0	99.0	1 410.7	1 790.7	2 229.8	2 753.3	3 269.4	3 775.6	4 201.4	4 660.5	5 152.7	5 677.4	6 183.9	6 668.9	7 134.0	7 585.0	8 026.9	8 460.0	8 885.1	9 298.4
Other assets	146.5	197.0	189.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total non-current assets	14 442.5	16 458.7	14 689.1	15 623.9	16 617.2	17 656.5	18 718.0	19 814.7	20 934.7	22 070.5	23 199.7	24 308.5	25 380.4	26 417.1	27 421.0	28 393.3	29 329.5	30 233.8	31 114.1	31 977.7	32 827.0	33 665.1	34 490.2
Trade and other receivables	153.9	170.5	172.0	178.6	187.2	194.0	199.5	205.2	210.7	218.3	223.4	228.5	233.1	237.1	240.5	243.8	244.6	246.4	248.9	252.1	255.4	259.1	262.7
Bonds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Home loans to staff	8.4	8.4	8.6	8.9	9.4	9.7	10.0	10.3	10.5	10.9	11.2	11.4	11.7	11.9	12.0	12.2	12.3	12.5	12.6	12.8	13.0	13.1	13.1
Other financial assets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prepaid expenses	24.2	23.4	27.1	28.2	29.5	30.6	31.5	32.4	33.2	34.4	35.2	36.0	36.8	37.4	37.9	38.4	38.6	38.9	39.2	39.8	40.3	40.9	41.4
Cash and cash equivalents	100.0	60.2	163.1	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	10.0	10.0	10.0	10.0	10.0
Total current assets	286.5	262.5	370.8	225.7	236.1	244.3	251.0	257.8	264.4	273.7	279.8	286.0	291.5	296.3	300.5	304.4	305.4	307.6	310.6	314.4	318.4	322.9	327.3
Total assets	14 729.0	16 721.2	15 060.0	15 849.6	16 853.4	17 900.8	18 969.0	20 072.5	21 199.1	22 344.2	23 479.4	24 594.5	25 671.9	26 713.4	27 721.5	28 697.7	29 634.9	30 541.4	31 424.6	32 292.1	33 145.5	33 988.0	34 817.5
Equity and liabilities																							
Retained earnings	-1 943.4	-1 129.2	-3 732.1	-3 586.2	-3 401.0	-3 104.0	-2 772.7	-2 403.3	-1 998.4	-1 540.6	-1 060.2	-564.4	-56.4	465.0	1 106.6	1 782.5	2 463.8	3 161.5	3 883.7	4 630.5	5 400.5	6 196.3	7 013.7
Other components of equity	-14 937.2	-10 995.8	-459.3	-748.4	-276.7	-584.9	-943.6	-1 302.6	-1 673.8	-2 098.0	-2 534.3	-3 132.5	-3 733.5	-2 321.0	-2 551.5	-2 823.8	-3 181.2	-3 928.5	-3 910.8	-3 892.1	-3 872.7	-3 852.5	-3 831.7
Total equity	-16 880.5	-12 125.0	-4 191.4	-4 334.6	-3 677.7	-3 688.9	-3 716.3	-3 705.9	-3 672.2	-3 638.6	-3 594.5	-3 696.9	-3 789.9	-1 856.0	-1 444.9	-1 041.4	-717.3	-767.0	-27.1	738.3	1 527.9	2 343.8	3 182.0
Defined benefit liability	29 984.9	27 077.1	17 439.0	18 452.4	18 720.9	19 708.8	20 736.9	21 752.6	22 766.8	23 819.4	24 866.2	26 057.1	27 218.7	26 335.8	26 956.7	27 566.2	28 206.1	29 180.8	29 334.5	29 439.0	29 499.6	29 516.9	29 494.7
Salary Savings Plan obligation	146.1	196.7	188.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other employee-related liabilities	31.1	63.1	29.2	32.0	32.8	33.1	33.7	33.9	34.3	34.8	35.4	36.0	36.6	37.0	37.6	38.1	38.7	39.4	40.1	40.9	41.8	42.8	43.8
Finance lease liabilities	47.1	29.2	21.0	21.8	22.9	23.7	24.4	25.1	25.7	26.7	27.3	27.9	28.5	29.0	29.4	29.8	29.9	30.1	30.4	30.8	31.2	31.6	32.1
Prepaid fees	531.7	622.3	740.1	788.2	830.8	870.5	907.2	951.5	996.3	1 027.1	1 048.6	1 058.0	1 056.2	1 044.0	1 022.4	998.3	949.3	934.9	924.7	918.5	915.3	914.4	914.4
Total non-current liabilities	30 741.0	27 988.3	18 418.2	19 294.5	19 607.3	20 636.1	21 702.1	22 763.1	23 823.1	24 907.9	25 977.4	27 179.0	28 339.9	27 445.8	28 046.0	28 626.2	29 243.0	30 199.6	30 339.9	30 436.1	30 491.1	30 506.6	30 485.0
Other employee-related liabilities	247.5	223.1	204.6	224.7	229.9	232.2	236.1	238.1	240.4	244.3	248.1	252.4	256.6	259.9	263.5	267.3	271.6	276.2	281.4	287.1	293.3	299.9	307.0
Trade and other payables	190.1	198.2	196.4	205.3	210.1	215.0	219.9	224.8	229.9	235.2	240.6	246.6	252.7	257.7	262.9	268.2	273.5	279.0	284.6	290.3	296.1	302.0	308.0
Finance lease liabilities	16.1	15.7	9.3	9.7	10.0	10.2	10.4	10.7	10.9	11.2	11.4	11.7	12.0	12.2	12.5	12.7	13.0	13.2	13.5	13.8	14.0	14.3	14.6
Provisions	6.0	5.9	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Prepaid fees	408.8	414.9	416.3	443.4	467.3	489.7	510.3	535.2	560.4	577.7	589.8	595.1	594.1	587.3	575.1	558.1	544.7	534.0	525.9	520.1	516.6	514.9	514.4
Total current liabilities	868.5	857.8	833.2	889.7	923.8	953.6	983.2	1 015.3	1 048.2	1 074.8	1 096.5	1 112.3	1 121.8	1 123.6	1 120.4	1 112.8	1 109.2	1 108.9	1 111.9	1 117.7	1 126.5	1 137.6	1 150.5
Total liabilities	31 609.5	28 846.2	19 251.4	20 184.1	20 531.1	21 589.7	22 685.4	23 778.4	24 871.3	25 982.8	27 073.9	28 291.3	29 461.8	28 569.4	29 166.4	29 739.0	30 352.2	31 308.5	31 451.8	31 553.8	31 617.6	31 644.2	31 635.5
Total equity and liabilities	14 729.0	16 721.2	15 060.0	15 849.6	16 853.4	17 900.8	18 969.0	20 072.5	21 199.1	22 344.2	23 479.4	24 594.5	25 671.9	26 713.4	27 721.5	28 697.7	29 634.9	30 541.4	31 424.6	32 292.1	33 145.5	33 988.0	34 817.5

Table 7: Statement of cashflows

in EUR mn		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Position	Unit	actual	actual	actual	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast	forecast
Cash flow from operating activities																								
	MN€																							
Renewal fees for patent applications	MN€	442.3	434.3	467.6	534.0	562.8	589.7	614.6	644.6	675.0	695.8	710.4	716.8	715.5	707.3	692.6	672.2	656.0	643.1	633.4	626.4	622.2	620.1	619.5
Procedural fees related to the patent grant process	MN€	870.3	796.8	774.1	766.3	829.1	865.1	891.1	911.8	932.2	982.8	1011.5	1048.9	1084.7	1118.4	1149.8	1178.9	1172.2	1168.9	1165.7	1163.9	1161.8	1162.2	1164.2
National renewal fees for granted patents	MN€	597.6	640.7	663.1	679.1	692.8	706.5	718.8	731.9	744.1	758.3	772.8	787.8	804.6	824.1	846.2	874.5	906.2	942.7	983.2	1028.1	1071.6	1115.6	1155.1
Cash receipts from Revenue from patent and procedural fees	MN€	1 910.2	1 871.9	1 904.8	1 979.4	2 084.7	2 161.4	2 224.4	2 288.3	2 351.2	2 436.9	2 494.6	2 553.5	2 604.9	2 649.8	2 688.7	2 725.6	2 734.5	2 754.8	2 782.3	2 818.4	2 855.7	2 897.8	2 938.8
Cash receipts from Other revenue	MN€	70.1	64.1	66.8	68.0	61.7	62.4	62.9	63.5	63.7	65.9	65.9	66.4	67.1	67.7	68.4	69.0	69.5	70.0	70.5	71.1	71.7	72.3	72.9
Cash Adjustment for pre-paid fees	MN€	-19.2	96.7	119.3	75.2	66.5	62.0	57.3	69.2	70.1	48.0	33.6	14.7	-2.9	-19.0	-33.8	-47.2	-37.3	-29.8	-22.4	-16.1	-9.7	-4.9	-1.4
Cash receipts from other operating income	MN€	6.0	6.3	15.1	15.0	15.7	16.3	16.7	17.2	17.7	18.3	18.7	19.2	19.6	19.9	20.2	20.5	20.5	20.7	20.9	21.2	21.4	21.7	22.0
EPO Contributions to RFPSS	MN€	-325.4	-180.3	-192.2	-248.6	-246.1	-248.8	-253.6	-256.6	-260.0	-264.9	-269.9	-275.5	-281.2	-285.9	-290.8	-295.9	-301.3	-306.8	-312.7	-318.7	-325.0	-331.4	-338.1
EPO Contributions to SSP	MN€	-17.8	-20.2	-21.7	-15.0	-16.3	-17.8	-18.9	-20.1	-21.2	-22.6	-24.0	-25.5	-27.1	-28.5	-30.1	-31.7	-33.4	-35.2	-37.1	-39.1	-41.3	-43.6	-46.0
Basic salaries permanent employees	MN€	-755.1	-755.2	-742.7	-815.7	-834.5	-842.9	-857.0	-864.4	-872.7	-886.8	-900.7	-916.1	-931.3	-943.3	-956.3	-970.4	-985.7	-1 002.6	-1 021.4	-1 042.1	-1 064.5	-1 088.6	-1 114.5
Allowances and other benefits	MN€	-315.1	-261.1	-185.9	-302.1	-309.1	-312.2	-317.4	-320.2	-323.3	-328.5	-333.6	-339.3	-345.0	-349.4	-354.2	-359.4	-365.1	-371.4	-378.3	-386.0	-394.3	-403.2	-412.8
Other	MN€	-41.8	-43.4	-40.1	-122.5	-131.7	-139.3	-147.5	-156.0	-164.9	-174.5	-184.7	-195.8	-207.4	-218.8	-229.6	-240.2	-250.4	-260.1	-268.9	-276.9	-284.0	-290.4	-295.9
Cash paid for Employee benefit expenses	MN€	-1 455.2	-1 260.2	-1 182.5	-1 504.0	-1 537.7	-1 561.0	-1 594.4	-1 617.3	-1 642.0	-1 677.3	-1 713.0	-1 752.3	-1 791.9	-1 826.0	-1 861.0	-1 897.6	-1 935.9	-1 976.1	-2 018.3	-2 062.8	-2 109.1	-2 157.2	-2 207.3
Cash paid for Other operating expenses	MN€	-231.7	-263.2	-251.7	-263.1	-269.2	-275.5	-281.8	-288.1	-294.6	-301.3	-308.3	-316.0	-323.8	-330.3	-336.9	-343.6	-350.5	-357.5	-364.7	-372.0	-379.4	-387.0	-394.7
Adjustment for other non-cash items	MN€	78.6	-77.6	-94.0	3.6	13.3	15.0	13.3	10.6	7.6	1.7	0.9	0.8	0.7	0.6	0.4	0.5	0.6	0.7	0.6	0.7	0.7	0.7	0.7
Changes in assets and liabilities carried as working capital	MN€	99.5	-0.2	-58.9	24.2	0.7	-0.3	2.9	0.7	1.3	0.8	4.0	4.9	5.6	4.2	5.3	5.9	9.3	8.7	8.6	8.5	9.0	9.2	10.0
Cash flow from operating activities	MN€	458.3	437.8	518.8	398.3	435.7	480.4	501.4	544.2	575.0	593.0	596.5	591.3	579.4	567.1	551.5	533.2	510.4	491.3	477.6	469.0	460.4	452.7	441.0
Cash flow from investing activities																								
	MN€																							
Investment in PPE	MN€	-24.9	-33.4	-51.9	-19.6	-32.9	-58.0	-112.1	-97.1	-45.1	-72.4	-87.5	-162.7	-117.8	-72.7	-24.8	-24.9	-25.0	-25.1	-25.2	-25.3	-25.5	-25.6	-25.7
Change in Other financial assets	MN€	0.0	0.0	-80.0	-528.1	-397.9	-418.7	-386.3	-443.9	-526.8	-516.4	-506.2	-425.8	-459.1	-492.2	-524.7	-506.5	-485.0	-465.2	-451.0	-441.9	-433.1	-425.1	-413.3
Change in RFPSS	MN€	-325.4	-180.3	-192.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Change in EPOTIF	MN€	-50.0	-250.0	-80.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	MN€	-1.5	3.0	4.7	-3.7	-4.8	-3.7	-3.1	-3.1	-3.0	-4.3	-2.8	-2.9	-2.5	-2.2	-1.9	-1.8	-0.4	-1.0	-1.4	-1.8	-1.8	-2.1	-2.0
Cash flow from investing activities	MN€	-401.8	-460.7	-399.5	-551.4	-435.7	-480.4	-501.4	-544.2	-575.0	-593.0	-596.5	-591.3	-579.4	-567.1	-551.5	-533.2	-510.4	-491.3	-477.6	-469.0	-460.4	-452.7	-441.0
Cash flow from financing activities																								
	MN€																							
Cash flow from financing activities	MN€	-17.7	-16.9	-16.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net increase (decrease) in cash and cash equivalents	MN€	38.9	-39.9	103.0	-153.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

B. Sensitivities

B.1 External production sensitivities

This section gives an overview of external production sensitivities that have the potential to affect aspects of the EPO’s production target. The sensitivities are either outside the EPO’s direct control (such as the development of incoming workload) or a combination of the EPO’s own ambition and customer demands (as in the case of timeliness pathways).

B.1.1. Incoming workload

The sensitivities for incoming workload are used to assess how the EPO’s financial position would be affected by an increased or decreased level of incoming workload compared to the Base Case assumption. The first of the two sensitivities is based on the so-called “MTBP Historic” projection of incoming workload up to 2028. Then, for the period 2029-2042, it uses the observed average growth rate in the incoming workload over the past 10 years. The overall result is stronger growth in incoming workload than the Base Case. The second sensitivity is built up on the model mentioned in 3.3.1 and leads to lower levels of incoming workload than the Base Case. The assessment shows that both sensitivities result either in a virtually unchanged coverage gap/surplus (EUR -29 mn in the case of slower growth) or in a positive impact on the coverage gap/surplus (EUR 1.5 bn in the case of faster growth), so long as the size of the examiner workforce is adjusted to the production target.

Figure 27: Incoming workload

Sensitivity as Delta to Base Case	Coverage gap/surplus (in EUR mn)	Difference compared to the Base Case (in EUR mn)	Δ Workforce (in 2028)	Δ Workforce (in 2042)
1 Parallel shift +100 bp of growth rate	5 741	1 504 (+36%)	116	646
2 Parallel shift -20 bp of growth rate	4 208 -29	(-1%) -112	-112	-173

■ Positive impact on coverage gap/surplus
 ■ Negative impact on coverage gap/surplus

B.1.2. Timeliness targets

Sensitivities for the timeliness targets are used to assess the robustness of the Base Case to deviations from the timeliness assumption. To evaluate this sensitivity, the productivity pathway remains unchanged from the Base Case, so all deviations in timeliness requirements must be compensated by a change in the examiner workforce. Sensitivities were assessed that hypothesise reaching the “Paris Criteria” in 2028, 2033 and 2042. Not surprisingly, the earlier the “Paris Criteria” are achieved, the larger a short-term increase in the workforce must take place – and the larger the reduction in workforce can be at the tail end of the projection period while still satisfying the timeliness targets. The impact on the coverage gap/surplus is EUR -0.7 bn when aiming to achieve the “Paris Criteria” by 2028 and EUR 0.2 bn when aiming to achieve them by 2042. Though stricter timeliness criteria lead to a short-term increase in the workforce, the impact of this is reduced – though not entirely compensated – by an increase in short-term revenues from procedural fees and lower salary costs towards the second decade of the projected period.

Figure 28: Timeliness targets

Sensitivity as Delta to Base Case		Coverage gap/surplus (in EUR mn)	Difference compared to the Base Case (in EUR mn)	Δ Workforce (in 2028)	Δ Workforce (in 2042)
1	Meet “Paris criteria” earlier (first quarter of forecasting period)	3 495	-742 (-18%)	367	-50
2	Meet “Paris criteria” earlier (first half of forecasting period)	3 728	-508 (-12%)	226	-43
3	Meet “Paris criteria” later (end of forecasting period)	4 453	216 (+5%)	0	120

■ Positive impact on coverage gap/surplus ■ Negative impact on coverage gap/surplus

B.2 Macroeconomic sensitivities

This section gives an overview of macroeconomic sensitivities, which have impacts on the EPO’s asset or liability side and are driven mostly by external forces (such as the discount rate and inflation). Increases in either procedural or internal renewal fees are also listed in this category, as they are historically tied to inflation trends. The sensitivities for fee increases also include the 5.0% increase in procedural fees planned – but not officially decided – for 2024.

B.2.1. Procedural fee increases

Sensitivities for procedural fee increases consist of the impact of the 5.0% increase in procedural fees planned for 2024 and the continuing biennial inflation-based fee increases. It is prudent to consider for its inherent inflation mitigating effect. As these sensitivities only increase revenues, their impact on the coverage gap/surplus is positive. It ranges between EUR 0.6 bn for the one-time fee increase and EUR 3.7 bn for the biennial adjustment.

Figure 29: Procedural fee increases

Sensitivity as Delta to Base Case	Coverage gap/surplus (in EUR mn)	Difference compared to the Base Case (in EUR mn)	Δ Equity (in 2042)	Δ Operating cash flow (in EUR mn)	Δ Operating result (in EUR mn)
1 One-time increase (+5.0% in 2024)	4 852	616 (+15%)	621	732	735
2 Biennial inflation based	7 931	3 694 (+87%)	3 750	4 172	4 213

■ Positive impact on coverage gap/surplus
 ■ Negative impact on coverage gap/surplus

B.2.2. Internal renewal fee increases

Sensitivities for internal renewal fee increases consist of the impact of the intended 5.0% increase in 2024 and continuing the practice of biennial inflation-based fee increases. It is prudent to consider for its inherent inflation mitigating effect here. As these sensitivities only increase revenues, the impact on the coverage gap/surplus is positive. It ranges from EUR 0.4 bn for the one-time fee increase to EUR 2.4 bn for the biennial adjustment. The difference between the impacts on the coverage gap/surplus of an increase in internal renewal and an increase in the procedural fee is entirely explained by the fact that the increases are applied to figures of different magnitude.

Figure 30: Internal renewal fee increases

Sensitivity as Delta to Base Case	Coverage gap/surplus (in EUR mn)	Difference compared to the Base Case (in EUR mn)	Δ Equity (in 2042)	Δ Operating cash flow (in EUR mn)	Δ Operating result (in EUR mn)
1 One-time increase (+5.0% in 2024)	4 635	398 (+9%)	401	484	485
2 Biennial inflation based	6 645	2 408 (+57%)	2 440	2 760	2 784

■ Positive impact on coverage gap/surplus
 ■ Negative impact on coverage gap/surplus

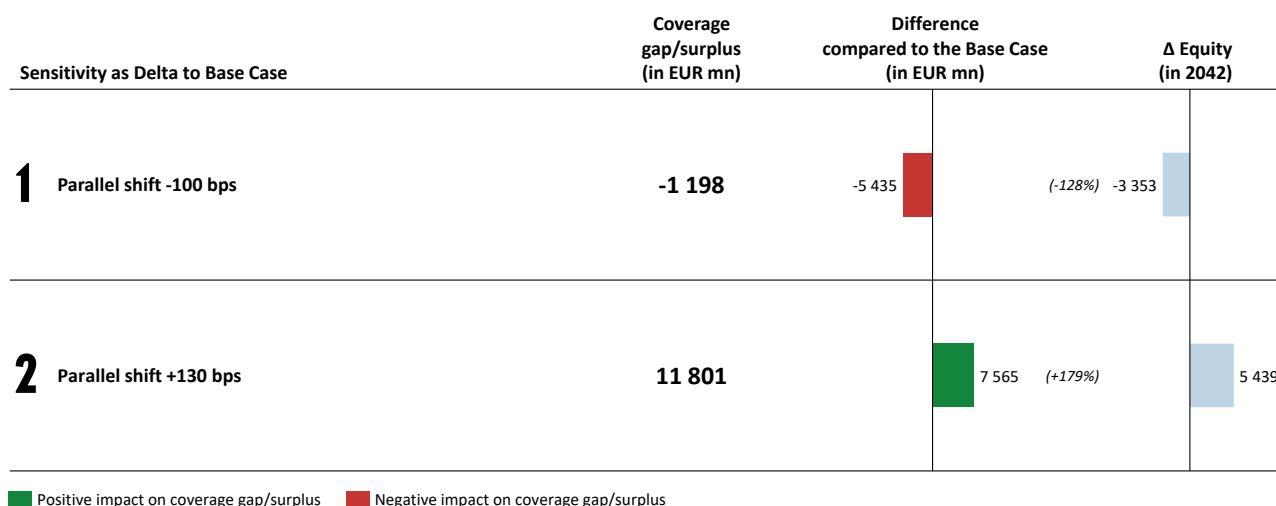
B.2.3. EPOTIF/ RFPSS returns

Sensitivities for the EPOTIF and RFPSS returns are evaluated based on different levels of confidence for the expected returns from investments paired with a higher or lower degree of risk appetite. The expected return of 3.6% p.a. reflects a low risk appetite of the EPO and an 80% confidence level of achieving this return. The return expectation of 5.9% is based on a high-risk allocation of assets and a 50% confidence level.

It is important to note that the discount rate for assessing the coverage gap/surplus also depends on the level of expected returns. The impact on the coverage gap/surplus falls between EUR -5.4 bn (3.6% expected return) and EUR 7.6 bn (5.9% expected return), as a lower expected return reduces the increase in the asset size, while the resulting reduced discount rate increases the size of the DBO. The exact opposite impact is observed for the expected return of 5.9%.

The sensitivities are evaluated as deviations in the real return of the assets, while inflation remains unchanged.

Figure 31: EPOTIF/ RFPSS returns

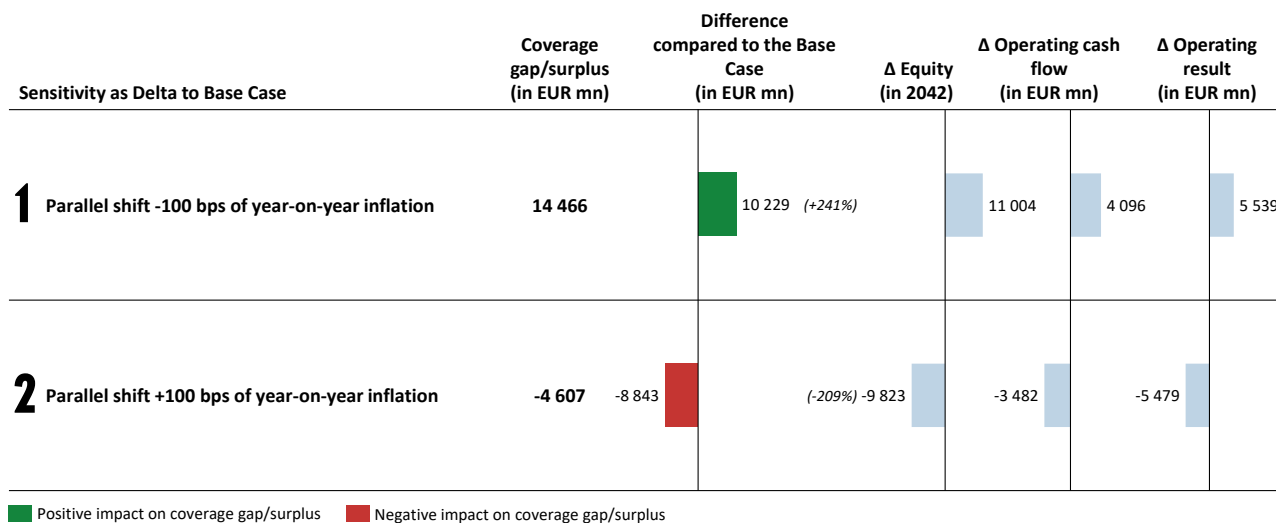


B.2.4. Inflation

The sensitivities to inflation are calculated as parallel shifts of the Base Case inflation curve by 100 bp, upwards in one case and downwards in the other. This has an impact on the EPO’s costs and obligations through changed basic salaries and DBO, causing an impact on the coverage gap/surplus of EUR -8.8 bn in the case of increased inflation and EUR 10.2 bn for reduced inflation. The large size of these impacts is mainly due to the compounding effect of inflation on both basic salaries and the DBO. For comparison, the inflation assumption of the Base Case leads to a compound inflation factor of 1.57, whereas the inflation-reducing sensitivity arrives at a compound inflation factor of 1.29, and the inflation-increasing sensitivity leads to a compound inflation factor of 1.90.

The nominal discount rate and nominal expected returns of the EPOTIF and the RFPSS are unaffected by these inflation shocks. This is assumed in order to isolate the inflation effect and avoid cross-contamination of potentially observed asset returns and because the discount rate of the Base Case was derived as a nominal discount rate.

Figure 32: Inflation



B.3 Internal production sensitivities

This section gives an overview of internal production sensitivities. These concern aspects of the EPO’s production capacity that are either under the EPO’s direct control (as in the case of workforce trends) or are a direct responsibility of the EPO (as in the case of productivity trends).

B.3.1. Productivity

To assess the robustness of the Base Case financial situation to deviations in underlying productivity development, two sensitivities were evaluated. Each illustrates a different way of falling short of the Base Case productivity targets.

One sensitivity assumes no further productivity growth after 2028. The other assumes slower growth than in the Base Case after 2028, of +1 product per FTE per year. In both sensitivities, it is assumed that these productivity shortfalls are compensated by an increase in the examiner workforce and thus have no impact on revenues. But an impact on employee benefit expenses is observed. A decrease of up to EUR -1.6 bn in the coverage gap/surplus is caused by an increase of between 350 and 841 in the examiner workforce in 2042.

But for both sensitivities, the projected coverage gap/surplus remains a surplus. This illustrates that, as long as the productivity target of 128 products per FTE in 2028 is reached with the projected workforce, any further deviations from projected productivity within the Base Case can be compensated without resulting in an actual coverage gap.

Figure 33: Productivity in products per FTE

Sensitivity as Delta to Base Case		Coverage gap/surplus (in EUR mn)	Difference compared to the Base Case (in EUR mn)		Δ Workforce (in 2042)	Δ Products per FTE (in 2042)
1	-1 products per FTE p.a. after 2028	2 675	-1 561 (-37%)		841	-28
2	-2 products per FTE p.a. after 2028	3 263	-973 (-21%)		396	-15

■ Positive impact on coverage gap/surplus
 ■ Negative impact on coverage gap/surplus

B.3.2. Examiner workforce growth

Two sensitivities were assessed for examiner workforce growth. Each expresses a different way to proactively and steadily increase the workforce in order to ease the demand on productivity improvement. In line with the results observed for productivity sensitivities, these increases in workforce have a negative impact on the coverage gap/surplus. The impact of an increase of 546 examiners in 2042 is EUR -0.7 bn, while that of 1 164 examiners is EUR -1.5 bn. But the increases do not cause an actual coverage gap.

Interestingly, the sensitivity of growing the workforce by 2% p.a. after 2028 leads to a larger examiner workforce in 2042 than the sensitivity of not increasing productivity after 2028 – but the impact of the former on the coverage gap remains smaller. This is because the workforce grows to a larger size more quickly in the productivity sensitivity.

Figure 34: Examiner workforce growth

Sensitivity as Delta to Base Case		Coverage gap/surplus (in EUR mn)	Difference compared to the Base Case (in EUR mn)		Δ Workforce (in 2042)	Δ Products per FTE (in 2042)
1	Parallel shift +100 bp of growth rate after 2028	3 534	-702 (-17%)		546	-20
2	Parallel shift +200 bp of growth rate after 2028	2 766	-1 470 (-35%)		1 164	-38

■ Positive impact on coverage gap/surplus
 ■ Negative impact on coverage gap/surplus

C. Assumptions for the financial model

Production

Assumption	Description	Parameter	Source
P1 Timeliness	Timeliness is measured in output-months. It is determined as the end-of-period stock in cases divided by production in cases in the same period	<ul style="list-style-type: none"> Output-months for search and examinations are forced to six and 36 months respectively 	<ul style="list-style-type: none"> DG1 (11 August 2023)
P2 Productivity	Products per head is a modelling output	<ul style="list-style-type: none"> Result from timeliness target 	<ul style="list-style-type: none"> DG1 (11 August 2023)
P3 Products per FTE	Products per FTE is a modelling output	<ul style="list-style-type: none"> Result from calculated PPH, with a correction for incapacity, unpaid capacity and Section III investments 	<ul style="list-style-type: none"> DG1 (13 September 2023)
P4 Efficiency	Time per search, time per examination and time per opposition are modelling outputs	<ul style="list-style-type: none"> Determined by time allocation to each product Set to match DG1 expectation on behaviour 	<ul style="list-style-type: none"> DG1 (11 August 2023)
P5 Core time	Time every examiner has available for SEO production	<ul style="list-style-type: none"> Set to 175 days per examiner 	<ul style="list-style-type: none"> DG1 VP4
P6 Product split Search	Split assumed between Search products: Euro-direct Euro-PCT international phase Euro-PCT supplementary phase "Others"	<ul style="list-style-type: none"> Split between products assumed to reflect split of incoming workload in each year 	<ul style="list-style-type: none"> Modelling approach
P7 Product split within Search stock and Examination stock	Split of stock between product types: Search and Examination	<ul style="list-style-type: none"> No differentiation assumed between different types of Search in stock; No differentiation assumed between different types of Examination in stock 	<ul style="list-style-type: none"> Modelling approach

Production

Assumption	Description	Parameter	Source
P8 Incoming workload – European Examinations	Percentage of Searches excluding Searches for national offices, resulting in European Examinations	• 78.1%, constant over time	• MTBP 2024-2028
P9 Incoming workload – PCT Ch II	Percentage of PCT International resulting in PCT Ch II Examinations	• 6.0%, constant over time	• MTBP 2024-2028
P11 Patents published	Percentage of European Examinations resulting in published patents	• 71.0%, constant over time	• MTBP 2024-2028
P12 Incoming workload – PCT Searches	Share of Euro-PCT international Searches of Euro-PCT Searches incoming workload	• 57.0%, constant over time	• MTBP 2024-2028
P13 Product split Examination	Share of European Examination cases completed in total Examination cases completed	• 92.7%, constant over time	• MTBP 2024-2028

Workforce & Salaries

Assumption	Description	Parameter	Source
WS1 Model granularity	Granularity of modelling in workforce and salaries	<ul style="list-style-type: none"> Workforce modelling performed for each Job Group, Function, Pension scheme, and salary grade and step Salary modelling performed on salary grade and step combination level 	<ul style="list-style-type: none"> Leadership Meeting (30 June 2023)
WS2 General approach	Approach to model workforce and salaries	<ul style="list-style-type: none"> Expected number of employees forecasted as follows: Career progression: Utilisation of transition matrix based on probability of career progression for each job group Leaves: Forecasted leaves of active employees per year, distributed across the workforce based on employee distribution New hires: Product of leaves and replacement ratio per function Total salary forecasted as follows: Average salary: Weighted average across countries based on number of employees calculated at grade and step combination level, adjusted based on EPO salary adjustment method Total base salary: Product of forecasted employees and average salaries Additional salary dynamics: Bonus, allowances, cash payments, other employee groups & capacity adjustments as lump sum on total base salary 	<ul style="list-style-type: none"> Leadership Meeting (30 June 2023)

Workforce & Salaries

Assumption	Description	Parameter	Source
WS3 Retirements	Number of retirees and distribution across functions, grades and steps	<ul style="list-style-type: none"> Total forecasted number of retirees based on projected data on change in active employees Distribution of leavers estimated from employee distribution in previous years Breakdown of employees across functions and pension scheme based on employee distribution of previous years (2024 and 2025 are actuals) 	<ul style="list-style-type: none"> PD Finance (29 June 2023)
WS4 Additional exits	Number of employees leaving due to reasons other than retirement	<ul style="list-style-type: none"> No additional leaves explicitly modelled 	<ul style="list-style-type: none"> PD Finance (29 June 2023)
WS5 Examiner new hires	Entry level of newly hired examiners	<ul style="list-style-type: none"> 100% of new hires assumed to enter in JG4, G8-1 	<ul style="list-style-type: none"> PD Finance (29 June 2023)
WS6 FO new hires	Entry level of new FOs hired	<ul style="list-style-type: none"> 100% of new hires assumed to enter in JG6, G3-1 	<ul style="list-style-type: none"> PD Finance (29 June 2023)
WS7 Other new hires	Entry level of other employees hired	<ul style="list-style-type: none"> New hires assumed to enter in JG3-4: <ul style="list-style-type: none"> 85% in JG4, G8-1 15% in JG3, G13-3 New hires assumed to enter in JG5-6 <ul style="list-style-type: none"> 80% in JG6, G3-1 20% in JG5, G7-1 	<ul style="list-style-type: none"> PD Finance (29 June 2023)
WS8 Basic salary	Basic salary for an employee, taking country pay scales into consideration	<ul style="list-style-type: none"> Weighted average salaries for each grid position based on number of employees per country 	<ul style="list-style-type: none"> PD Welfare and Remuneration (19 May 2023) PD Finance (29 June 2023)

Workforce & Salaries

Assumption	Description	Parameter	Source
WS9 Salary adjustment	Yearly adjustment of basic salaries because of growing cost of living	<ul style="list-style-type: none"> Eurozone HICP + 20 bps as adjustment based on sustainability clause 	<ul style="list-style-type: none"> PD Finance (29 June 2023)
WS10 Unpaid capacity salary adjustment	Adjustment of FTE salaries for unpaid time, such as part-time and unpaid leaves	<ul style="list-style-type: none"> 4.5%, based on weighted average of examiner unpaid capacity and other employees <ul style="list-style-type: none"> – Examiner unpaid capacity based on MTBP 2024-2028 average (5.1%) – Other employees at (3.0%) 2022 value assumed to be constant across forecasted period 	<ul style="list-style-type: none"> PD Finance (29 June 2023)
WS11 Career progression	Yearly growth of basic salaries as a result of career progression	<ul style="list-style-type: none"> Structure of yearly career progression: <ul style="list-style-type: none"> – 40% of employees do not progress – 40% of employees progress by one step – 20% of employees progress by two steps Progression levels assumed constant across all grades, steps, functions and pension schemes Employees assumed not to be able to switch job groups, thus reaching promotion ceilings 	<ul style="list-style-type: none"> PD Finance (26 July 2023)

Workforce & Salaries

Assumption	Description	Parameter	Source
WS12 Salary increase schedule	Point in time of salary adjustment	<ul style="list-style-type: none"> Salary increase effective on 1 Jan 2023 	<ul style="list-style-type: none"> PD Finance (29 June 2023)
WS13 Bonus payments	Annual bonus paid to employees	<ul style="list-style-type: none"> Actual ratio of bonus payment to total salaries in 2022 assumed to be constant across forecasted period 	<ul style="list-style-type: none"> PD Finance (29 June 2023)
WS14 Additional cash payment	Additional cash payment due to redistribution pool	<ul style="list-style-type: none"> Assumed as 0.3% of total workforce salaries 	<ul style="list-style-type: none"> PD Finance (14 July 2023)
WS15 Allowances	Additional allowances (excluding bonus) for employees	<ul style="list-style-type: none"> 30%, implicit as average allowance to total salary ratio in the period 2018-2022 Assumed constant over the forecasted period 	<ul style="list-style-type: none"> PD Finance (29 June 2023)
WS16 Other employee groups	Group of employees comprised of JG1 and JG2 employees, young professionals and JG3 BoA	<ul style="list-style-type: none"> 349 employees in 2022 with total salary mass of EUR 45 mn Salary mass of other employee groups assumed to grow at salary adjustment level + career progression factor of 1.5% (only JG3 BoA group) 	<ul style="list-style-type: none"> PD Finance (26 July 2023)

Pensions & Benefits

Assumption	Description	Parameter	Source
PB1 Cashflow benefits existing employees	DBO projection of benefits	<ul style="list-style-type: none"> • Calculations based on cashflows delivered by SIRP • Service cost in future years is calculated by distribution of difference between full cash flows and accrued cash flows 	<ul style="list-style-type: none"> • SIRP
PB2 Cashflow benefits excl. pensions new employees	DBO projection of benefits	<ul style="list-style-type: none"> • Calculations based on cashflows delivered by SIRP • Service cost in future years is calculated by distribution of difference between full cash flows and accrued cash flows • Based on new entries, service cost is adapted accordingly 	<ul style="list-style-type: none"> • SIRP
PB3 Cashflow pensions new employees	DBO projection of benefits	<ul style="list-style-type: none"> • Standard cashflow for a mixture of new hires is calculated with same assumption as cash flows of SIRP • Based on new entries, service cost is adapted accordingly 	<ul style="list-style-type: none"> • Mercer

Assets

Assumption	Description	Parameter	Source
A1 Discount rate	Discount rate for DBO and interest costs calculation	<ul style="list-style-type: none"> • AA-rating corporate bonds yield • 3.9% - 5.6% based on estimated return on assets for coverage gap/surplus computation 	<ul style="list-style-type: none"> • Base Case Workshop (19 June 2023)
A2 YoY inflation	Inflation expectation	<ul style="list-style-type: none"> • Market implied inflation, HICP curve • Linear interpolation used for tenors without direct quote 	<ul style="list-style-type: none"> • Barclays • EUHICPX Zero Coupon Breakeven Swap Rate
A3 European equity market return	Benchmark for growth sensitive asset projection	<ul style="list-style-type: none"> • 4.8% p.a. • Expected return from European large cap equities 	<ul style="list-style-type: none"> • Mercer
A4 GDP growth rate	Use in 1Y government bond yield projection	<ul style="list-style-type: none"> • 1.5% p.a. • Constant long-term GDP growth rate 	<ul style="list-style-type: none"> • Mercer
A5 Contribution rate	The contribution rate for each benefits plan	<ul style="list-style-type: none"> • Assuming the AAG recommended rates will be implemented 	<ul style="list-style-type: none"> • CA/52/23
A6 Risk-free rate	Risk-free rate in Eurozone	<ul style="list-style-type: none"> • Eurozone swap rate as proxy for risk-free rate 	<ul style="list-style-type: none"> • Eurozone swap rate • Mercer

Revenues

Assumption	Description	Parameter	Source
R1 Procedural fee revenue calculation	Procedural fees payable per product	<ul style="list-style-type: none"> Matching of corresponding fee value and number of cases 	<ul style="list-style-type: none"> PD Finance (12 July 2023)
R2 Fee increase schedule	Annual growth rate of fees per major fee category	<ul style="list-style-type: none"> No fee increase for procedural fees No fee increase for IRF No fee increase for NRF 	<ul style="list-style-type: none"> PD Finance (20 July 2023)
R3 Other revenue streams	Average national-office and third-party search fee per case	<ul style="list-style-type: none"> EUR 1 957 (implicit fee assumption based on actual other revenues and modelled production) 	<ul style="list-style-type: none"> PD Finance (11 July 2023)
R4 Time of filing of applications	Limit to the time of filing of applications	<ul style="list-style-type: none"> Assumed that there are no applications filed before 1 July 2005 Reflected in fee value used for <ul style="list-style-type: none"> 002: Fee for a European search 005: Designation fee 006: Examination fee 	<ul style="list-style-type: none"> PD Finance (12 July 2023)
R5 Claims fees revenue	Ratio to calculate claims fee revenue as a percentage of European searches (Euro-direct and Euro-PCT supplementary) and European examination revenue	<ul style="list-style-type: none"> 6.8% Constant over forecasted period 	<ul style="list-style-type: none"> PD Finance (11 July 2023)
R6 Online and not-online filing factor	Share of EP direct and Entry EP phase filings done online and not online	<ul style="list-style-type: none"> Online: 99.2% Not online: 0.8% Different fee applied in each case Constant across forecast period 	<ul style="list-style-type: none"> PD Finance (11 July 2023)

Revenues

Assumption	Description	Parameter	Source
R7 PCT ISA filings split factor Euro-PCT supplementary Searches	Fee applied to Euro-PCT supplementary Searches coming from the following ISAs: AU, CN, JP, KR, RU, US, ES, SE, AT, FI, NO	<ul style="list-style-type: none"> PCT ISA cases that enter the European phase: 63% PCT ISA cases that do not enter the European phase: 37% Used to calculate the overall number of entry EP phase online (share of PCT ISA + Euro-PCT supplementary Searches) Constant across forecast period 	PD Finance (11 July 2023)
R8 Additional filing fee for the 36 th and each subsequent page – Euro-direct	Ratio to calculate additional Euro-direct filing fee revenue as a percentage of Euro-direct filing fee revenue	<ul style="list-style-type: none"> 164.7% Constant across forecast period 	PD Finance (11 July 2023)
R9 Additional filing fee for the 36 th and each subsequent page – Entry EP phase	Ratio to calculate additional entry EP phase filing fee revenue as a percentage of Entry EP phase filing fee revenue	<ul style="list-style-type: none"> 239.2% Constant across forecast period 	PD Finance (11 July 2023)
R10 Discount factor for Euro-direct search fees	Discount factor to account for refunds in the Euro-direct search fee value	<ul style="list-style-type: none"> 77.6% Constant across forecast period 	PD Finance (11 July 2023)
R11 Discount factor for Euro-PCT supplementary Search fees	Discount factor to account for refunds in the Euro-PCT supplementary Search fee value	<ul style="list-style-type: none"> 98.1% Constant across forecast period 	PD Finance (11 July 2023)
R12 Search age structure	Age structure and distribution of Search cases	<ul style="list-style-type: none"> Overall age structure used as defined in EPO Finance planning Different age structure used for Euro-direct and Euro-PCT supplementary Search fees 	PD Finance (11 July 2023)

Revenues

Assumption	Description	Parameter	Source	
R13	Age distribution for NRF and IRF calculation	Rescaling of distribution of cases per ordinal year to achieve target distribution over the forecast period, under the assumption that production will prioritize older cases	<ul style="list-style-type: none"> • No rescaling performed for IRF due to shift in curve to target distribution, indicating progress of past years in clearing out older cases • Rescaling method performed for NRF, since progress in production of older cases not yet reflected in distribution of cases per ordinal year 	<ul style="list-style-type: none"> • PD Finance (12 July 2023)
R14	IRF age structure	Changes in age structure of IRF pending cases	<ul style="list-style-type: none"> • Assumed constant based on 2022 distribution 	<ul style="list-style-type: none"> • PD Finance (12 July 2023)
R15	NRF age structure	Changes in age structure of NRF pending cases	<ul style="list-style-type: none"> • Overall current age structure used as defined in EPO Finance planning • Share of new IRF pending cases in ordinal years 8-20 is reduced to 20% of their current share • Assumed as a gradual process over time starting in 2023 and completed in 2028 	<ul style="list-style-type: none"> • PD Finance (12 July 2023)
R16	Internal renewal fees adjustment parameter	Factor to calibrate calculated IRFs to historical values in IFRS income statement	<ul style="list-style-type: none"> • +0.9% • Constant across forecast period • Related to refunds, interest to late payments and other 	<ul style="list-style-type: none"> • PD Finance (26 July 2023)

Revenues

Assumption	Description	Parameter	Source
R17 National renewal fees	National renewal fees payable per annum per case split by ordinal years	<ul style="list-style-type: none"> NRF fees structure constant at 2022 level: 2022 NRF fee revenue per ordinal year divided by NRF paying cases per ordinal year in 2022 	<ul style="list-style-type: none"> PD Finance (11 July 2023)
R18 Claims fee revenue split factor	Split factor to allocate claims fee revenue between search fees (Euro-direct and Euro-PCT supplementary) and European examination fees	<ul style="list-style-type: none"> Search fees (Euro-direct and Euro-PCT supplementary): 27.7% European examination fees: 72.3% 	<ul style="list-style-type: none"> PD Finance (11 July 2023)
R19 Discount factor for PCT ISA search fees	Discount factor to account for refunds in the PCT ISA search fee value	<ul style="list-style-type: none"> 35.0% Constant across forecast period 	<ul style="list-style-type: none"> PD Finance (11 July 2023)
R20 PCT ISA search age structure	Age structure and distribution of PCT ISA searches	Overall age structure used as defined in EPO Finance planning	<ul style="list-style-type: none"> PD Finance (11 July 2023)

Revenues

Assumption	Description	Parameter	Source
R21 Transmittal fees	Transmittal fees payable per PCT ISA search	<ul style="list-style-type: none"> Average implicit fee calculated using a top-down approach Calculation based on 2022 revenue per product type divided by production per product type 	<ul style="list-style-type: none"> PD Finance (26 July 2023)
R22 Discount factor for European examination fees	Discount factor to account for refunds in the European examination fee value	<ul style="list-style-type: none"> 92.5% Constant across forecast period 	<ul style="list-style-type: none"> PD Finance (11 July 2023)
R23 Other fees related to Examination and grant	Ratio to calculate revenue from other fees related to examination and grant as a percentage of examination and grant fee revenue	<ul style="list-style-type: none"> 1.7% Constant across forecast period 	<ul style="list-style-type: none"> PD Finance (11 July 2023)
R24 European examination age structure	Age structure and distribution of European examination cases	<ul style="list-style-type: none"> Overall current age structure used as defined in EPO Finance planning Share of new European examination cases over eight ordinal years is reduced to 20% of their current share Assumed as a gradual process over time, starting in 2023 and completed in 2028 	<ul style="list-style-type: none"> PD Finance (12 July 2023)
R25 Opposition fees	Opposition fees payable per opposition	<ul style="list-style-type: none"> Average implicit fee calculated using a top-down approach Calculation based on 2022 revenue per product type divided by production per product type in 2022 	<ul style="list-style-type: none"> PD Finance (11 July 2023)

Revenues

Assumption	Description	Parameter	Source
R26 Appeal and protest fee	Ratio to calculate appeal and protest fee revenue as a percentage of opposition fee revenue	<ul style="list-style-type: none"> 181.6% (appeal fees were restructured) Constant across forecast period 	<ul style="list-style-type: none"> PD Finance (11 July 2023)
R27 Cases paying IRF	Share of pending cases that pay IRF	<ul style="list-style-type: none"> 81.0% Constant across forecast period 	<ul style="list-style-type: none"> PD Finance (11 July 2023)
R28 Geographic distribution of NRF paying cases	Geographical distribution of NRF paying cases	<ul style="list-style-type: none"> Implicitly assumed as constant over time 	<ul style="list-style-type: none"> PD Finance (11 July 2023)
R29 Maintenance rate of NRF paying cases	Maintenance rate of NRF paying cases	<ul style="list-style-type: none"> Maintenance rates are extrapolated from countries with full data availability for 20 years (weighted average) and assumed as constant over time Implicit assumption: Individual patents originating from same EPO grant have same lifetime in all countries in which they are validated 	<ul style="list-style-type: none"> PD Finance (11 July 2023)
R30 Cases paying NRF in year of grant	Share of patents granted that pay NRF in the year the patent was granted	<ul style="list-style-type: none"> 51.3% 	<ul style="list-style-type: none"> PD Finance (11 July 2023)
R31 Patent validation in member states	Share of patents granted that are validated in at least once in one member state	<ul style="list-style-type: none"> 96.8% 	<ul style="list-style-type: none"> PD Finance (11 July 2023)

Revenues

Assumption	Description	Parameter	Source
R32 Patents validated per grant	Number of patents validated in different countries stemming from one EPO grant	<ul style="list-style-type: none"> • Implicitly assumed as constant as of 2022 	<ul style="list-style-type: none"> • PD Finance (26 July 2023)
R33 National renewal fees adjustment parameter	Factor to calibrate calculated NRF to historical values in IFRS income statement	<ul style="list-style-type: none"> • +0.5% yearly • Constant across forecast period • Related to accruals, minimum fees and others 	<ul style="list-style-type: none"> • PD Finance (26 July 2023)
R34 Effect of the UPP on revenues	Impact of UPP on revenues	<ul style="list-style-type: none"> • Net effect of the UPP on revenues is modelled as neutral 	<ul style="list-style-type: none"> • PD Finance (26 July 2023)

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Oliver Wyman
Muellerstrasse 3
80469 Munich
Germany



Mercer
Platz der Einheit 1
60327 Frankfurt am Main
Germany