3. Management of the Debt Portfolio and Risk Limits

3.1. Management of the State's Derivatives Portfolio

During the course of 2017 several early repayments of the IMF loan were made, which led to a significant reduction of the State's derivatives portfolio. The total amount due to the IMF decreased from SDR 12.8 billion at the end of 2016 to only SDR 4.6 billion at the end of 2017, with the respective currency hedge approaching 100%.

Table 5 – IMF loan

(SDR million)	IMF loan			Currency hedging	
	Total outstanding	EUR component	Other currencies	Principal	Interest
31/Dec/16	12,802.5	3,881.9	8,920.6	100.0%	65.9%
31/Mar/17	11,471.0	3,495.1	7,975.9	99.0%	77.2%
30/Jun/17	10,660.7	3,381.2	7,279.5	99.0%	78.5%
30/Sep/17	8,545.3	2,760.4	5,784.9	98.7%	84.5%
31/Dec/17	4,570.6	1,488.4	3,082.2	98.6%	92.5%

Source: *IGCP*

Rollover operations of existing hedges, associated with the IMF loan and bonds issued in foreign currency, continued to be executed.

In this context, 270 exchange rate derivatives transactions were executed during the year, with a notional amount of EUR 12.8 billion. These transactions include the cancellation of 10 cross-currency swaps, with a contractual value of EUR 1.9 billion.

Table 6 – Transactions involving financial derivatives in 2017

(EUR million)	Contractual Amount				No. of Operations			
	CCIRS	Swaps/ forwards	Options	Total	CCIRS	Swaps/ forwards	Options	Total
USD	1,437.3	6,441.9	493.5	8,372.8	6	71	43	120
GBP	241.7	602.1	0.0	843.8	2	23	0	25
JPY	220.5	836.8	0.0	1,057.2	2	30	0	32
CNH	0.0	2,520.5	0.0	2,520.5	0	93	0	93
Total	**1,899.5**	**10,401.3**	**493.5**	**12,794.3**	**10**	**217**	**43**	**270**

Source: *IGCP*

The market value of the financial instruments portfolio on the exchange rate decreased over the course of 2017, mainly due to the cancellation of hedges of the IMF loan (in 2017 early repayments were made to the IMF in the amount of EUR 8.6 billion) and to the appreciation of the euro.

On 1 February 2017, Decree-Law no. 86-D/2016, of 30 December, entered into force. The object of this law was to transfer to the municipality of Lisbon the contractual position held by the State in the public service concession agreement entered into by Carris and of all the shares representing the company's share capital. Through Article 6 (e) of this Decree-Law, the State assumed the liabilities arising from financial derivatives contracts signed by Carris until 30 December 2016. At the end of 2017, only one derivative signed by the company remained outstanding, with a market value of EUR -5.4 million.

Table 7 – Change in the financial derivatives portfolio

(EUR million)	Market Value		*CF* period	Result
	Dec-16	*Dec-17*		
Interest rate	**-80.2**	**-91.3**	**59.3**	**48.2**
IRS	109.3	51.4	59.3	1.4
Swaptions	-189.5	-142.7	0.0	46.8
Exchange rate	**2,186.1**	**527.6**	**278.8**	**-1,379.6**
CCIRS	2,060.8	517.4	187.6	-1.355.8
Swaps / forwards	125.3	10.2	91.3	-23.8
Options	0.0	0.0	-0.1	0.0
Others	**-17.1**	**-5.4**	**-11.5**	**0.1**
CARRIS	-17.1	-5.4	-11.5	0.1
Total	**2,106.0**	**430.9**	**326.6**	**-1,331.3**

Source: *IGCP*

The negative result of EUR 1.4 billion obtained with cross-currency swaps mainly reflects the appreciation of the euro and is offset by an equivalent exchange rate gain on the underlying debt instruments. As an illustration, the following table shows the exchange gains obtained on the outstanding principal of the IMF loan and the USD and NOK bonds, whose exchange hedge has been chiefly provided by these derivative instruments.

Table 8 – Exchange gain with instruments underlying cross-currency swaps

(EUR million)	Maturity	Debt on 31/Dec/17	Exchange gain vs 31/Dec/16
IMF loan	24/Apr/24	5,427.4	887.6
USD bond	15/Oct/24	3,743.1	523.5
NOK bond	07/Oct/19	87.4	7.2
Total		**9,257.9**	**1,418.2**

Source: *IGCP*

With regard to interest rate risk, *IGCP* chose to maintain the average maturity and the duration of the portfolio resulting from the financing operations (mostly fixed rate). No interest rate derivative operations were contracted.

3.2. *EPR* PORTFOLIO

As part of its duties in managing the State direct debt, *IGCP* is responsible for monitoring the debt and derivatives portfolio of public enterprises that are financed through the State Budget (*EPR* – State-owned companies within General Government).

In April 2017, the Portuguese State reached an agreement with Banco Santander Totta to end judicial litigation resulting from the swap agreements entered into with State-owned enterprises, including *Metropolitano de Lisboa* and *Metro do Porto*. The agreement reached determined the payment of the suspended coupons from 2013, ensuring the validity of the contracts.

Considering that the *EPR* are restricted from obtaining financing in the market, no new financial derivatives for risk coverage were contracted. Throughout 2017 three instruments matured: a simple interest rate swap of *Transtejo* in February with a contractual value of EUR 27.5 million; the options included in *Parpública's* convertible bonds in September, with a contractual value of EUR 885 million; and a swap of *Metropolitano de Lisboa* in December, with a contractual value of EUR 1.5 million.

Parpública's convertible bonds had the option of being converted by investors into shares of *GALP Energia, SGPS, S.A.* and reached maturity with a residual value of 0, since the share price was below the conversion price. *IGCP* actively sought alternatives to mitigate the risk of this operation (and possible refinancing), and chose to keep the structure unchanged from the perspective of the evolution of the underlying share price (which was confirmed).

In turn, the financial instrument derived from *Metropolitano de Lisboa* corresponded in practice to a simple interest rate swap since the optionality was very out-of-the-money. Its market value at the end of the previous quarter was already greatly reduced due to the approximation of the maturity.

In this context, there were 23 derivative instruments in the *EPR* portfolios at the end of 2017, with a negative market value of EUR 1,153.3 million and a contractual value of EUR 1,289.8 million.

Table 9 – *EPR* derivatives portfolio

(EUR million)	No. derivatives	Contractual amount	MtM 2017	MtM 2016	CF 2017	Result
Metropolitano de Lisboa	16	674.0	-540.1	-702.6	-118.7	43.8
Metro do Porto	4	200.5	-445.9	-519.0	-70.9	2.1
Parpública	3	415.2	-167.3	-236.8	-20.9	48.6
Transtejo	-	-	0.0	-0.7	-0.7	0.0
Total	**23**	**1,289.8**	**-1,153.3**	**-1,459.1**	**-211.2**	**94.6**

Source: The valuation of the counterparties is presented where available; otherwise *IGCP*'s valuation is given.

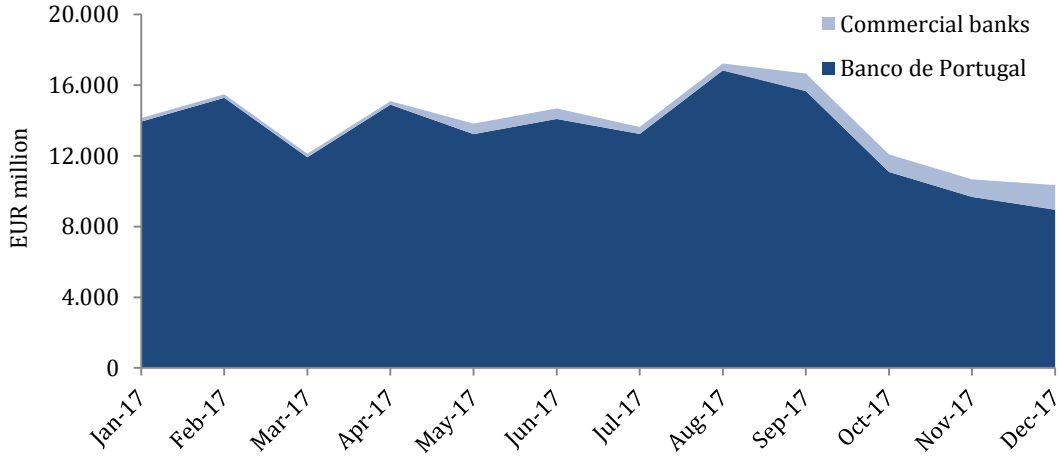
The market value of this portfolio improved by around EUR 305.8 million throughout the year, which is explained by the cash flow payment of approximately EUR 211.2 million and a favourable net result of EUR 94.6 million.

The favourable result is mainly due to the reduction in the value of the options for converting *Parpública's* shares into Galp's shares, with a result of EUR 44.1 million (justified by the reduction in the time value of the options), and by receiver swaptions of *Metropolitano de Lisboa*, which generated a result of EUR 37.2 million due to the increase in interest rates in the euro area.

3.3. CASH MANAGEMENT

During 2017, the main objective was to ensure maximum liquidity in the State's cash balances. In this sense, of all the instruments theoretically available to manage liquidity, preference was given to deposits with *Banco de Portugal*.

Graph 12 – Developments in the amount of deposits of the Single Treasury Account



Source: *IGCP*

The table below presents three alternative estimates for the net cost of the cash position over the last 3 years (following the methodologies presented in Box 2.3 of the Annual Report for 2014). In 2017, the absolute cost of maintaining the treasury position increased according to the first two methodologies, as a result of the increase in the average cash balance, an effect that was partially offset by the reduction in the cost of debt financing.

Table 10 – Estimate of the cost of the cash position

Estimated cost of the Treasury cash position									
	Implicit rate total stock [1]			Average cost (BT+OT)[2]			Average cost (BT) [3]		
(EUR million)	2015	2016	2017	2015	2016	2017	2015	2016	2017
Average balance of deposits	13,856	12,378	14,439	13,856	12,378	14,439	13,856	12,278	14,439
Funding Cost (%)	3.4%	3,2%	3.0%	1.6%	1.5%	1.4%	0.1%	0.0%	-0.2%
Average cost of funding of the Treasury cash balance	479	394	433	223	181	197	8	3	2
Interest received from Treasury applications	-13	-4	-4	-13	-4	-4	-13	-4	-4
Net cost of the Treasury cash balance	**465**	**391**	**429**	**210**	**178**	**194**	**-5**	**-1**	**-37**
As a % of the average balance of deposits	3.4%	3.2%	3.0%	1.5%	1.4%	1.3%	0.0%	0.0%	-0.3%
As a % of the average balance of the State's direct debt	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%
As a % of GDP	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%

[1] Implicit interest rate is computed as the ratio between interest of the State's direct debt paid on an accrual basis and the average debt stock in a given year.
[2] Funding cost of BT and OT corresponds to the average interest rate of new financing of BT (funded issues) and OT during the year.
[3] Funding cost of BT corresponds to the average interest rate of new financing of BT (funded issues) during the year.
Source: *IGCP*

As a cash management instrument, bilateral repurchases of Treasury Bonds were also favoured, and several early repayments were made to the IMF, as shown in the following table. *IGCP* also intervened in the *OT* market with the aim of minimising episodes of volatility in the secondary market.

Table 11 – Buybacks made in 2017

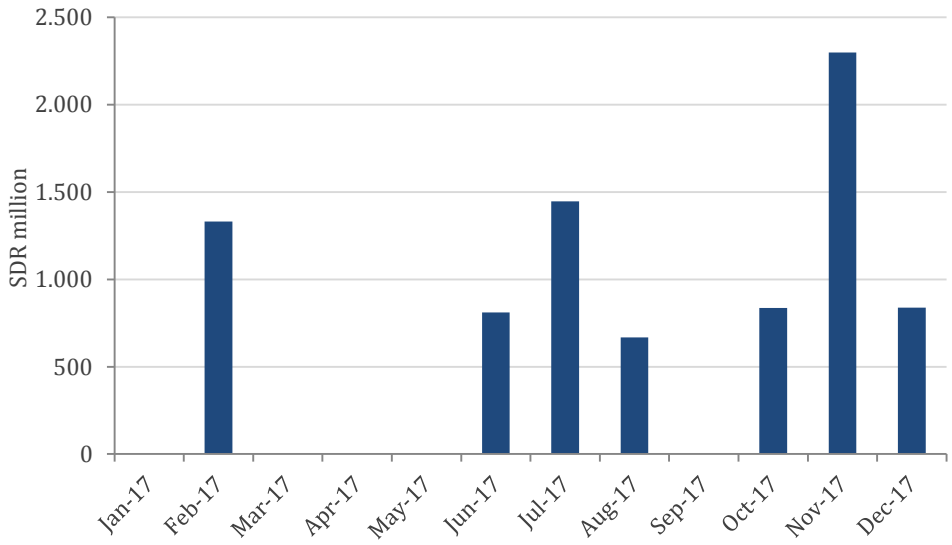
(EUR million)	1Q17	2Q17	3Q17	4Q17	Total 2017
OT [1]	1,212.7	240.1	1,836.9	1,039.0	**4,328.6**
IMF loan	1,702.9	988.0	2,561.6	4,760.1	**10,012.5**
Others	54.0	54.0	100.0	54.0	**262.0**
Total	**2,969.6**	**1,282.1**	**4,498.5**	**5,853.1**	**14,603.2**

[1] Includes exchange operations
Source: *IGCP*

In the first half of the year, all early repayments of the IMF loan allowed by the first authorisation granted by the European institutions to Portugal (in the amount of SDR 11,471 million) were concluded.

In the second quarter, a second authorisation was granted, in the amount of SDR 7,608.3 million, making it possible to continue the early repayment program. At the end of the year, the outstanding amount stood at SDR 4.6 billion, which corresponds to about 20% of the initial amount of the loan.

Graph 13 – Early repayments to the IMF



Source: *IGCP*

3.4. Cost Indicators

As of 31 December 2017, the market value of the State's direct debt[13] was EUR 269,556 million, reflecting a 12% premium over its nominal value. The average coupon of the portfolio decreased in 2017 to 2.96%, while the average yield dropped to 1.39%. The average debt repayment term declined slightly to 8.11 years.

Table 12 – Cost indicators[14] at year-end

(EUR millions)	2015	2016	2017
Outstanding (1)	223,918	233,895	237,515
Average coupon	3.33%	3.08%	2.96%
Average yield	1.76%	1.79%	1.39%
Average redemption period (years)	8.79	8.32	8.11
Market value	255,725	260,747	269,556
Premium (incl. accrued interest)	12.7%	9.9%	12.0%

(1) Nominal value of total debt after derivatives hedging. Value differs from that reported in table 25, since in this case the *BT* are valued at the discounted value.
Source: *IGCP*

[13] In relation to the total portfolio used as reference in previous years reports, the State direct debt (compatible with the definition reported in *IGCP*'s Monthly Bulletin and with the portfolio considered for the purposes of the risk indicators reported quarterly to the ESDM – Economic and Financial Committee's Sub-Committee on EU Sovereign Debt Markets) does not include cash investments and includes the cash-collateral received in the margin accounts associated with financial derivatives and securities issued for delivery as collateral.
[14] The average coupon is calculated by annualising the accrued interest between the last two working days of the year divided by the outstanding for the last day. The premium indicator is obtained by subtracting the unit at market value without accrued interest divided by the outstanding balance. The average yield corresponds to considering an *OT* with maturity equal to the average redemption period, which pays the average coupon annually and has a price equal to the market value, without accrued interest divided by the outstanding.

Marked-to-market cost

The provisional benchmark model was maintained in 2017. Under this model, active debt management operations carried out by *IGCP* are included in a separate portfolio whose mark-to-market assessment is used to measure the performance of *IGCP*'s active management.

In 2017, the marked-to-market cost of the Adjusted Debt Portfolio[15] was 6.10 per cent. A cost of 6.14 per cent was calculated for the benchmark portfolio in the same period, resulting in an unfavourable cost differential of 4.7 basis points.

In 2017, no new active interest rate management operations were contracted, whereby *IGCP*'s performance is currently of little significance.

3.5. RISK INDICATORS

The Guidelines for the Management of Government Debt (Guidelines) identify the risk indicators considered most relevant for the debt portfolio and set limits to its exposure. The Guidelines set maximum limits to the interest rate risk (refixing profile and modified duration), refinancing risk, exchange rate risk and credit risk.

CaR – Cost at Risk

The CaR estimate of the debt portfolio quantifies the effect of changes in risk-free interest rates on the value of the charges associated with the debt portfolio, assessed on a cash flow basis in the relevant future time horizon. Absolute CaR is the maximum amount that the cash-flow cost can reach with 95% probability over the following year; CaR reflects the maximum deviation of this cost compared to its expected value.

Using the State Budget for 2018 to forecast the annual borrowing needs, the portfolio's position at the end of 2017, constant financing spreads and the various scenarios simulated[16] for the swap curve dynamic, the expected value of the portfolio costs for 2018 (calculated on a national accounts' basis) is EUR 6,935 million and there is only a 5 per cent probability of this amount exceeding EUR 7,236 million (absolute CaR) as a result of changes in risk-free interest rates.

The relative CaR for the same significance level is EUR 302 million. In relative terms and in comparison with GDP, the probability of the deficit-to-GDP ratio increasing by more than 0.16p.p. in 2018 as a result of changes in risk-free interest rates is lower than 5%.

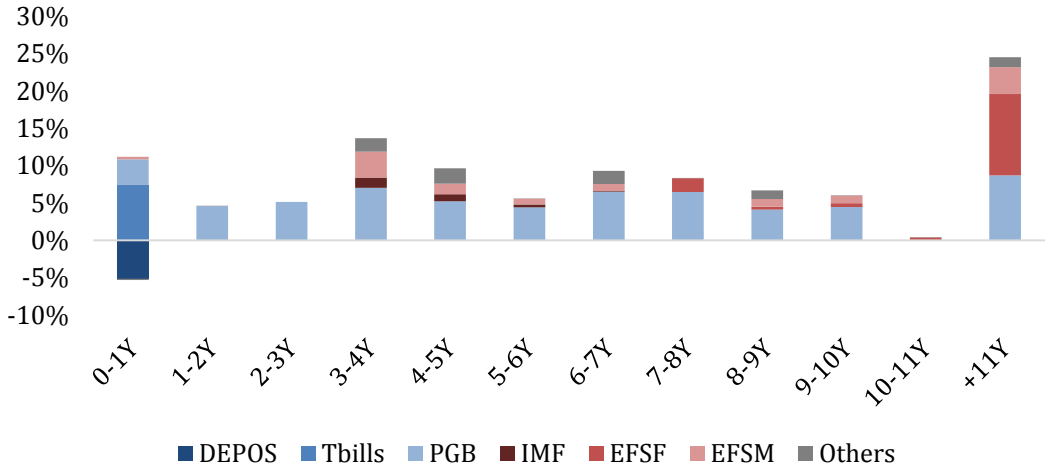
Refinancing risk

In addition to market variables (tradability, liquidity, maintaining a benchmark yield curve of the Republic, inter alia), the management of the debt portfolio takes into account the refinancing profile of the debt, so as to avoid an excessive concentration of redemptions that may lead to higher financing costs in the future.

The absolute limits set on the percentage of the portfolio maturing in a 12-month, 24-month and 36-month period are 25%, 40% and 50%, respectively. At the end of 2017, the adjusted portfolio had the following refinancing profile, complying fully with these limits.

[15] The Adjusted Debt Portfolio refers to all the instruments that make up the State direct debt, including financial derivatives, with the exception of promissory notes, retail debt and *CEDIC* and *CEDIM*.
[16] To simulate the interest-rate scenarios the 2-factor Cox, Ingersoll and Ross (1985) model was used.

Graph 14 – Refinancing profile of the debt portfolio at the end of 2017



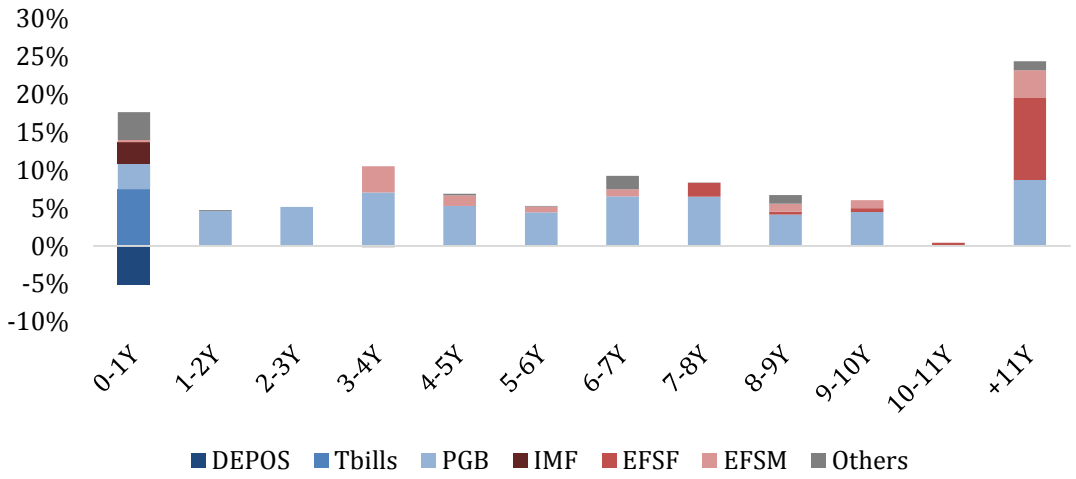
Source: *IGCP*

Interest rate risk

At the end of 2017, the modified duration[17] of the total debt portfolio and the adjusted portfolio was 5.46 and 5.98 years, respectively. Throughout 2017, the duration of the adjusted portfolio was always higher than the lower limit (4.0).

At the end of 2017, the debt portfolio had the following refixing profile (i.e. percentage of the nominal value of the adjusted portfolio to the refixed or maturing, by term):

Graph 15 – Refixing profile at end-2017



Source: *IGCP*

Exchange rate risk

At the end of 2017, the primary currency exposure (excluding hedging operations) was 3.85% of the total adjusted debt portfolio, far below the 20% limit set by the guidelines. This exposure is the result of disbursements from the IMF's Extended Fund Facility that is denominated in SDR, corresponding to a basket of EUR, USD, GBP, JPY and, since October 2016, CNY.

[17] The modified duration measures the elasticity of the portfolio's market value to changes in market yields.

IGCP has been using currency swaps to hedge the exchange rate exposure. At the end of the year the net exchange exposure was 0.07% (i.e., after swaps).

Credit risk

The assumption of credit risk by the Republic results from operations involving derivatives, repos and money market applications. The Guidelines in force, approved by the Secretary of State in 2013, establish the diversification of risk and the limits of exposure assigned to each counterparty according to its credit rating, which are monitored on an ongoing basis.

The credit risk of each counterparty (i.e. of all their derivatives contracts with the Republic) is calculated using the methodology which includes two components: its current market value, which represents the substitution value of each transaction plus an add-on, designed to estimate the potential change of that value in the future. The market value of the collateral received or delivered under the CSA should be subtracted from the amount resulting from the sum of these two components.

Throughout 2017, the credit risk exposure of the derivatives portfolio remained below the overall limit set at 3% of the adjusted portfolio. At the end of 2017, the exposure amounted to 0.19% of the value of the portfolio, i.e., that limit was occupied by 6.41%.

Table 13 – Risk indicators at year-end

(EUR million)	2014	2015	2016	2017
Primary Foreign Exchange Exposure (%adjusted portfolio)	12.50%	9.85%	8.26%	3.85%
Net Foreign Exchange Exposure (% adjusted portfolio)	3.60%	0.16%	0.00%	0.07%
Total Portfolio Duration (years)	5.24	5.34	5.71	5.46
Adjusted Portfolio Duration (years)	5.67	5.87	6.26	5.98

Source: *IGCP*