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OVERVIEW AND INVENTORY OF FRENCH FUNDS' LIQUIDITY MANAGEMENT TOOLS

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OVERVIEW AND INVENTORY
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Abstract:

This article constitutes a first presentation of the prospectus analysis tool developed through a cooperation between the Banque de France and the Autorité des marchés financiers (AMF). This work aims to identify the liquidity management tools (LMT) implemented by funds regulated by the AMF under French law ("French funds"). This work is part of a logic to follow up on IOSCO recommendations (2018) to strengthen the overall liquidity risk management framework in line with the recommendations adopted by the FSB (2017). In order to better manage the liquidity risk of investment funds, numerous measures are provided for by international texts, and imposed at the level of European Directives and Regulations governing funds and management companies or recommended by ESMA. In addition to the rules for monitoring and managing liquidity, certain tools can be used in normal times or in times of stress, in order to limit the risks of fire-sales or to mitigate their impact. This paper presents these liquidity management tools as precisely as possible and describes the adoption of these tools by French funds at the end of 2019, based on a textual analysis of the prospectuses.

Keywords: investment funds, prospectus, liquidity management tools, information retrieval.

JEL classification: G23

Résumé:

Cet article constitue une première présentation de l'outil d'analyse des prospectus élaboré à travers une coopération entre la Banque de France et l'Autorité des marchés financiers (AMF). Celui-ci vise à recenser les outils de gestion de la liquidité (*liquidity management tools* ou LMT) mis en place dans les fonds de droit français. Ces travaux s'inscrivent dans une logique de suivi des recommandations IOSCO de renforcer le cadre global de gestion du risque de liquidité dans le prolongement des recommandations adoptées par le FSB en 2017. Pour permettre de gérer au mieux le risque de liquidité des fonds d'investissement, de nombreuses mesures sont prévues par les textes internationaux, et imposées au niveau des Directives et Règlements européennes encadrant les fonds et sociétés de gestion ou recommandées par l'ESMA. En sus des règles permettant le suivi et le pilotage de la liquidité, certains outils peuvent être mobilisés en temps normal ou en période de stress, afin de limiter les risques de *fire-sales* ou d'atténuer leur impact. Ce papier présente ces outils de gestion de la liquidité le plus précisément possible et décrit l'appropriation de ces outils par les fonds de droit français à fin 2019, en s'appuyant sur une analyse textuelle des prospectus.

Mots clés : fonds d'investissement, prospectus, outils de gestion de liquidité, recherche textuelle.

Classification JEL : G23

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EXECUTIVE SUMMARY

This article is an initial presentation of the prospectus analysis tool produced by means of cooperation between the AMF and the Banque de France. It aims to identify the liquidity management tools (LMTs) deployed by French funds. This work was initiated in 2019 to monitor the progress in appropriation of these devices by the funds over time, and to compensate for the lack of an exhaustive regulatory database. The text mining method is based on 'automated reading' of prospectuses, searching for keywords and expressions associated with liquidity management tools. Despite technical limitations, this study programme represents an innovative basis for work complementing the qualitative or partial surveys currently performed on the subject, by providing an initial quantitative estimate of the tools mentioned in the prospectuses (and hence reported to the fundholders).
The computer code could be adapted in response to other issues (fees, socially responsible investment, etc.) or else extended to other jurisdictions (since prospectuses are by nature public).

Before presenting the first results relating to the liquidity management tools referred to in prospectuses at the end of 2019, it seems necessary to precisely identify and describe these tools, their legal and regulatory framework, and the way in which they are formalised (or not) in the prospectuses. This article therefore recalls the European and French framework with regard to liquidity management (Part 1) and describes the tools available to fund managers (Part 2). The last part presents the results of the analysis of French funds' prospectuses at the end of 2019. This analysis, which covers 9,768 prospectuses of funds in operation as of 31/12/2019, corresponding to a total net assets of €1,6 trillion (i.e. 98% if the total net assets of French funds) provides the first quantitative view of the liquidity management tools mentioned in the prospectuses, set out by major fund type but also by asset class.

This analysis shows that, as at 31 December 2019, the possibility of completely suspending redemptions in exceptional circumstances was mentioned in 71% of the prospectuses (82% of total net assets), and the possibility of proposing redemption in kind was indicated for 65% of fund unit classes (74% of net assets), although the conditions of exercise of such an option make it hard to implement in practice.
14% of the net assets of French funds were covered by a reference in the prospectus to at least one liquidity management tool strictly speaking (i.e. anti-dilution levies, gates or swing pricing). Anti-dilution levies were the least common (they only concerned less than 2% of the net assets of French funds). Next came swing pricing for 6% of net assets, and redemption gates for 9%.

Presentation of the tools in prospectuses and analysis results where applicable.

Tools	Mention in the prospectus	Analysed	% of the number of share classes	% of the Total Net Assets
Mechanisms enabling to slow down the asset sales				
NAV computation frequency	Yes	Yes	-	-
Redemption notice	Yes	Work in progress	-	-
Subscription notice	Yes	Work in progress	-	-
Settlement period	Yes	Work in progress	-	-
Possibility to suspend redemptions	Yes	Yes	71%	82%
Mechanisms to reflect the impact of liquidity on prices				
Commissions de souscriptions/rachats acquises aux fonds	Yes	No	-	-
Internal valuation in case official valuation no longer available	No	No	-	-
Anti-dilution levies	Yes	Yes	1%	2%
Swing-pricing	Yes	Yes	7%	6%
Mechanisms to limit the impacts on assets' liquidity				
Cap to the AuM	No	No	-	-
Systematic or temporary redemption gates	Yes	Yes	7%	9%
Side pocket	Yes	Yes	0,3%	0,2%
Possibility to offer redemption in kind	Yes	Yes	65%	74%

Source: Prospectus Analysis, AMF-Banque de France.

UCITS, and in particular UCITS that measure their overall risk using the value-at-risk method (VaR), seem to make more use of the latter two tools: swing pricing is indicated for 36% of the net assets of VaR-UCITS and 16% of the net assets of UCITS, while gates are indicated for 35% and 14% of the net assets respectively. AIF prospectuses refer to these tools far less often: they concern 6% of the net assets for gates, and less than 0.5% for the other two tools.

In terms of investment strategy and asset classes, the anti-dilution levy mechanism is introduced more often by equity funds (7% of net assets) and by other funds (9%), whereas it is practically inexistent in the other asset classes. The funds reputed to be less liquid are those most covered by gates, which concern 19% of the net assets of real estate funds, 15% of other funds and 32% of the net assets of hedge funds. Lastly, swing pricing is mentioned mostly by bond funds (19% of their net assets).

A pedagogical effort is required to foster a greater uptake of these liquidity management tools by the funds, but also to ease their acceptability from the point of view of investors, whether retail or institutional.

In light of the current economic and financial situation in the context of the Covid-19 pandemic, it is possible that certain regulatory constraints may be adapted, but this document could nevertheless constitute a useful inventory of pre-crisis tools. In the future, this work could allow dynamic monitoring of the adoption of LMTs by French funds, and be extended to other jurisdictions or other issues.

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INTRODUCTION

The liquidity risk of an open-ended investment fund is defined as "the risk that a position in the portfolio cannot be sold, liquidated or closed out at limited cost in an adequately short time frame and that the ability of the fund to comply at any time with the requirement of issuance and redemption at investors' demand is thereby compromised".[3]

In addition to the liquidity risk strictly speaking, there is the risk that substantial redemptions may result in a significant distortion of the fund's portfolio: to serve the first movers, funds may choose to sell their assets by decreasing order of liquidity (i.e. the most liquid ones in priority), leaving the less liquid securities for investors who redeem their fund units later, or who remain in the fund. This redemption management procedure, called *waterfall*, could contravene the obligation of fair treatment of fundholders.[4]

The materialisation of liquidity risk corresponds to the realisation of one of these factors, sometimes jointly:

- on the one hand, the need for the fund manager to sell assets, justified either by significant redemption requests (relative to the fund's AUM), or else by investment constraints (margin calls or observance of investment ratios); and
- on the other hand, a market environment in which the assets in question cannot find a buyer, except at a price far below their theoretical values. Moreover, it may prove very difficult to determine the "true" value of these assets in the absence of transactions.

These two factors can of course reinforce one another: a tense market environment and fears concerning liquidity may lead investors to request the redemption of their fund units and, on a large scale, this could accentuate the pressure on asset prices.

To enable optimal management of investment funds' liquidity risk of, numerous orientations are provided for by international regulations, and rules are imposed by European Directives and Regulations governing funds and asset management companies, or recommended by ESMA (fund structuring, risk monitoring and management, and redemption procedures): they are described in Part 1. These guidelines also concern the monitoring of funds' liabilities by the depository in order to enable the asset management company (AMC) to better identify the risks related to investor characteristics (e.g. the nature and concentration of unitholders), despite fund managers' still limited knowledge of their liabilities. Moreover, regular liquidity stress-test drills required by the regulations enable fund managers to perform regular monitoring of the risks, and prepare themselves to cope with them. These measures have been replicated or clarified in France in the Monetary and Financial Code (CoMoFi), in the AMF General Regulation (AMF GR) and in the AMF Policy.[5]

In addition to these rules allowing liquidity monitoring and supervision, certain tools can be deployed under both normal and stressed conditions, to limit risks or attenuate the impact of fire sales. Part 2 describes these liquidity management tools as precisely as possible. Lastly, the third part describes the appropriation of these tools by French funds at the end of 2019, based on a text mining method developed through a cooperation between the Banque de France and the AMF. This analysis shows that 14% of French funds in terms of net assets introduced at least one liquidity management tool (*gate*, *swing pricing* or *anti-dilution levy*) in their prospectus. The tools most

[3] Definition of liquidity risk in the *Guide to the organisation of the risk management system within asset management companies* (AMF Position-Recommendation No. 2014-06, version applicable at 24 January 2019), carried over from Article 3(8) of Directive 2010/43/EC and from Articles 312-44 (AIFs) and 321-76 (UCITS) of the AMF GR (version applicable at 8 February 2020).

[4] See Articles 411-20-1 of the AMF GR for UCITS, 411-21-1 for General purpose AIFs (FIVG), and 425-22 for specialised financial institutions (version applicable at 8 February 2020). NB: the amendments to the AMF GR ratified by the official decision of 18 March 2008 had at that time introduced in Article 411-11 of the AMF GR a first paragraph worded as follows: "The asset management company shall ensure equality of treatment between the fundholders of a given UCITS."

[5] Notably in AMF Instruction 2012-01 (*Risk management organisation for collective investment undertaking management activities and discretionary portfolio management investment services*, version applicable at 24 January 2019) and in AMF Position-Recommendation No. 2014-06 (*Guide to the organisation of the risk management system within asset management companies*, version applicable at 24 January 2019).

often cited are gates (9% of total net assets) and, to a lesser extent, swing pricing (6%). Anti-dilution levies are very marginal (only 2% of total net assets). UCITS, and in particular VaR UCITS, seem to make more use of these liquidity management tools. Consequently, although European and international recommendations and the extension of the tools available at the French level as permitted by the Sapin 2 Act have encouraged funds to establish these tools since 2017, it appears that their introduction remains limited.

1. A STRENGTHENED INTERNATIONAL AND EUROPEAN FRAMEWORK REGARDING FUNDS' LIQUIDITY RISK MANAGEMENT SINCE 2018

1.1. INTERNATIONAL AND EUROPEAN RECOMMENDATIONS

Continued overall growth in assets under collective investment management (particularly open-ended vehicles), and the gradual increase in funds' exposure to debt products and certain illiquid assets (particularly real estate assets) in a context of expansionary monetary policies have led international authorities to study the potential implications of funds' liquidity for financial stability.

In 2018,[6] the International Organization of Securities Commissions (IOSCO) recommended reinforcing the overall liquidity risk management framework as an extension of recommendations adopted by the Financial Stability Board (FSB) in 2017[7] along four main lines:

- Coherence of management of asset-liability imbalances (liquidity of the assets in light of the rules governing the redemption of fund units);
- Transparency in relations with fundholders and authorities regarding funds' liquidity profile;
- Asset managers' use of liquidity stress tests to increase resilience to extreme market circumstances; and
- Establishment by the authorities of a framework allowing AMCs' use of liquidity risk management tools.

These recommendations generally aim to preserve the diversity of tools available to managers to adapt their management of liquidity risks to the specific characteristics of the funds under management (strategies implemented, nature and structure of asset and liability exposures, etc.). The recommendations therefore provide the national authorities with relative discretion regarding the range of management tools proposed, and their publication is accompanied by a guide to good practices[8] illustrating the concrete use that can be made of the various tools. This work has been accompanied by legislative changes in several countries, particularly in the United States[9] and France[10], which reinforce the compliance of national systems with IOSCO recommendations.

In December 2017, the European Systemic Risk Board (ESRB) had sent three recommendations to the European Commission and the European Securities and Markets Authority (ESMA), aiming to specifically strengthen the liquidity risk management system in the European Economic Area:[11]

- Recommendation "A" aims to increase the availability of liquidity management tools in the EU, by including additional tools that could supplement the range of tools available in certain jurisdictions.[12] Furthermore, it gives ESMA a mandate to develop good practices so as to harmonise use of the tools by the industry and to ensure good coordination of the authorities when they use suspensions of fund unit redemptions that could have cross-border implications in the EU. This could prove extremely important in times of stress.

[6] Cf. "Recommendations for liquidity risk management for collective investment schemes", February 2018.
[7] Cf. "Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities", January 2017.
[8] Cf. "Open-ended Fund Liquidity and Risk Management. Good Practices and Issues for Consideration", February 2018.
[9] The framework adopted in the United States stands out in particular by the requirement for fund managers to put in place a liquidity risk management programme stressing three rules: a classification of assets in a portfolio according to their degree of liquidity, a minimum of investment in the most liquid assets and a cap on investment in the least liquid assets.
[10] Cf. Order No. 2017-1432 of 04/10/17 modernising the legal framework for asset management and debt financing.
[11] Cf. "Recommendation of the European Systemic Risk Board of 7 December 2017 on liquidity and leverage risks in investment funds" (ESRB/2017/6).
[12] This recommendation is sent to the European Commission to address possible needs to amend national legislation to this end. Here, the AMF considers that the applicable level 1 texts (UCITS, AIFMD) provide the necessary legislative framework, and it advocates level 2 treatment of ESMA standards. In any case, the assessment (see table in Annex II to the recommendations) shows the completeness of the system in France.

- Recommendation "B" asks for a reduction of the liquidity transformation risks of open-ended alternative investment funds (AIFs) investing significantly in structurally illiquid asset classes, by reinforcing their supervision. ESMA receives authority to draw up a list which will include real estate, unlisted securities, loans and other alternative assets.
- Recommendation "C" advocates that ESMA publish guidelines on liquidity stress tests to achieve convergence of practices within the existing legislative framework of the UCITS and AIFM directives.

1.2. THE EUROPEAN LIQUIDITY MANAGEMENT FRAMEWORK

In Europe, the regulatory framework governing funds' liquidity management consists of the UCITS Directive (2009/65/EC, relating to undertakings for collective investment in transferable securities) and the *AIFM* Directive (2011/61/EU on alternative investment fund managers). These directives already contain numerous rules which limit the potential for liquidity mismatch by forcing the fund manager to anticipate the liquidity of its assets and liabilities and to perform regular stress tests (see box 1 and box 2). Additional rules specific to money market funds (whether they be UCITS or AIFs) are imposed by the MMF Regulation (Regulation (EU) 2017/1131).

Box 1: The European regulatory framework governing the liquidity of investment funds

Directive 2009/65/EC – UCITS

UCITS are required to publish a net asset value (NAV) whenever a change is observed at the level of the fund units, and at least twice a month (Article 76).[13] In practice, many UCITS publish a daily or weekly NAV. Generally speaking, it should be clearly understood that the frequency of publication of the NAV is not necessarily equal to the frequency of subscriptions/redemptions: any activity on the fund units entails the calculation and publication of a NAV, but the publication of a NAV does not mean an authorisation to carry out subscriptions/redemptions. A fund with daily NAV calculation may well authorise redemptions only once a week.

The assets in which UCITS can invest are indicated explicitly in Article 50. This list contains only securities reputed to be liquid (listed liquid transferable securities, money market instruments, derivatives and bank deposits). UCITS may derogate from these rules for 10% of their total assets ("trash ratio").

An AMC is required to use an appropriate liquidity risk management procedure to ensure that each UCITS managed is capable of complying at any time with its obligation of redemption by a unitholder. If necessary, an AMC should perform stress tests to evaluate the liquidity risk of the UCITS in exceptional conditions.[14]

Directive 2011/61/EU – AIFMD

Article 15 of the Directive requires at the least that the risks associated with each position and their overall impact on the fund's portfolio are correctly identified, measured, managed and monitored continuously, in particular by means of stress tests (paragraph 3b). Article 16 also requires that the fund manager make sure that the investment strategy, liquidity profile and redemption policy of each fund are consistent (paragraph 2). It must have an appropriate liquidity management system, and regularly perform stress tests to assess and oversee the fund's liquidity risk (paragraph 1).

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[13] Article 76: *"A UCITS shall make public in an appropriate manner the issue, sale, repurchase or redemption price of its units each time it issues, sells, repurchases or redeems them, and at least twice a month.*

The competent authorities may, however, permit a UCITS to reduce the frequency to once a month on condition that such derogation does not prejudice the interests of the unit-holders."

[14] Cf. Article 40 of Directive 2010/43/EU, containing implementing measures for the UCITS Directive.

Regulation (EU) 2017/1131 – MMFR

The MMF Regulation defines a list of eligible assets for money market fund investments (Articles 8 to 16), and the requirements to be complied with in terms of concentration (Article 18), and at the portfolio level in terms of diversification (Article 17), maturity, duration and liquidity ratios (Articles 24 and 25). The assets of an MMF should be valued at least every day (Article 29), and the NAV should be calculated and published at least daily (Articles 30, 31 and 32). That said, MMFs are not required to offer daily liquidity to their investors (as a reminder, the frequency of calculation and publication of a NAV is not a promise of liquidity).[15] Money market funds must also have a sufficiently detailed knowledge of their liabilities to be able to "anticipate the effect of concurrent redemptions by several investors, taking into account at least the type of investor, the number of units or shares in the fund owned by a single investor and the evolution of inflows and outflows" (Article 27).[16]

The instructive Guide published by the AMF in November 2018 clarifies the French authority's requirements concerning the application of the MMFR.[17]

Box 2: Investment fund stress tests

The AIFM Directive imposes regular liquidity stress-test exercises, as well as stress tests for all kinds of risks (Articles 15 and 16), and also requires reporting to the regulator (Article 24-2-e).[18] For its part, the Directive containing implementing measures for the UCITS Directive requires that periodic stress tests be performed "where appropriate", including for assessment of liquidity risk.[19] In September 2019, ESMA published guidelines designed to define and achieve convergence of these two exercises.[20] Article 25 of the Guidelines requires that liquidity stress tests be performed at least every year, and the same article recommends a quarterly, or even higher frequency. These provisions will be applicable from 30 September 2020.

The MMF Regulation also lays down requirements for stress testing of money market funds (Article 28), including liquidity risks (see paragraph 1-a for liquidity of the assets, and paragraph 1-d for liquidity of the liabilities). Article 37-2-c specifies that the results of the stress tests are included in the mandatory reporting statement submitted at least every quarter to the national competent authorities.

Lastly, these level-one regulatory documents were supplemented by the publication, in March 2018, of the ESMA Guidelines on the definition of scenarios.[21] These Guidelines reiterate (§46 and 47) that the results of the standardised stress tests must be forwarded to the authorities.

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[15] For example, numerous employee savings scheme money market funds offer weekly liquidity, even though they are required by the MMF Regulation to publish a daily NAV.

[16] See also Article 37 of the MMFR which specifies the information to be reported to the competent authorities, explicitly including details on the fund's liabilities (paragraph 2e).

[17] AMF, Questions and Answers on money market funds – Instructive Guide for asset management companies, November 2018. See in particular questions 25 to 28 on risk management.

[18] See AIFM Directive.

[19] See Article 40 of Directive 2010/43/EU, and in particular paragraphs 2c and 3.

[20] "*Final Report – Guidelines on liquidity stress testing in UCITS and AIFs*", ESMA34-39-882, 2 September 2019. NB: pending publication of the official ESMA guidelines, some national authorities had proposed to their fund managers clarifications on stress-test exercises. Note, for example, the "*The use of stress tests as part of risk management – Guide for asset management companies*" published by the AMF in February 2017, or again the "*Report and guidelines on liquidity stress testing in German asset management companies*" by the BaFin, dated 16 April 2018.

[21] *Guidelines on stress test scenarios under Article 28 of the MMF Regulation* (ESMA34-49-115), 21 March 2018. Also see the 2020 update: *Guidelines on stress test scenarios under the MMF Regulation* (ESMA34-49-172), 03 March 2020 (§49).

1.3. THE FRENCH LIQUIDITY MANAGEMENT FRAMEWORK

The AMF replicates the European principles in its General Regulation and its policy, and adapts them to the French asset management context.

In particular, Position-Recommendation 2014-06 specifies the AMF's requirements regarding identification and management of the risks to which the funds are potentially exposed (regular risk mapping exercise). Liquidity risk is obviously part of the main risks that AMCs must assess. Risk mapping should take into account all the AMC's processes linked to the individual or collective investment management business, and determine whether or not a risk factor is critical by measuring the probability that it will occur. Risk mapping should then, where applicable, enable the company to make all the necessary improvements to the existing risk management system and set priorities for the controls to be performed.

Moreover, Instruction 2012-01 (Risk management organisation for collective investment undertaking management activities and discretionary portfolio management investment services) requires that all AMCs should have a permanent risk management function,[22] provided with the necessary resources to accomplish its mission (Article 2). Liquidity risk is explicitly mentioned as one of the responsibilities of the permanent risk management function, which must also be hierarchically and functionally independent of the operating units, whenever the AMC employs financial instruments involving particular valuation and/or liquidity difficulties.[23]

In short, investment-fund liquidity management is not confined merely to tools that can be used in cases of crisis: it forms an integral part of the fund manager's everyday work.

[22] In accordance with Article 39 of Delegated Regulation (EU) No. 231/2013 (AIFs) and Article 321-77 of the AMF GR (UCITS).

[23] In accordance with the provisions of Article 42 of Delegated Regulation (EU) No. 231/2013 supplemented by Articles 318-38 and 318-39 of the AMF GR (AIFs) and Article 321-77 of the AMF GR (UCITS).

2. LIQUIDITY MANAGEMENT TOOLS[24]

2.1. SYSTEMS FOR SLOWING DOWN ASSET SALES NEEDED TO MEET REDEMPTIONS

Three contractual factors can enable fund managers to have sufficient time to sell assets in satisfactory conditions when a redemption is requested: the intervals between net asset valuations (NAV), the time limit for order centralisation, and the period of prior notice.

The intervals between NAVs must be indicated in the fund's prospectus, as well as the time characteristics of subscription and redemption transactions. The latter generally take the form of a table, especially for UCITS funds, general purpose AIFs (FIVGs), funds of alternative funds (FFAs) and general purpose professional AIFs (FPVGs):[25]

"*Orders are executed in accordance with the table below:*

D-q weekdays [0 ≤ q ≤ 5]	*D-p weekdays [0 ≤ p ≤ 5]*	*D: day of NAV establishment*	*D+y weekdays*	*D+s weekdays [0 ≤ s ≤ 5]*	*D+z weekdays [0 ≤ z ≤ 5]*
Centralisation of subscription orders before [12.00][1]	*Centralisation of redemption orders before [12.00][1]*	*Order execution at the latest on D*	*Publication of the net asset value*	*Settlement of subscriptions*	*Settlement of redemptions*

Where "q" is the period of prior notice for subscription, "p" is the period of prior notice for redemption, "y" is the time for publication of the net asset value, "s" is the time for subscription of orders and "z" is the time for settlement of redemptions.

[1] except if a specific time has been agreed with your financial institution."

However, it should be noted that in the event of substantial redemption requests, these contractual arrangements may not be sufficient to avoid a distortion of the fund's risk profile or fire sales[26].

2.1.1. In ordinary conditions: intervals between net asset values

The fund manager may calibrate the intervals between the net asset values published by the fund to reflect the liquidity of the underlying assets. This contractual factor, appearing in the prospectus, thus makes it possible to match the liquidity offered to investors with that of the securities in the portfolio, especially when the latter are not valued every day. Less frequent NAVs are therefore especially suitable for funds exposed to small and mid caps, real estate, property, infrastructure, or else unlisted assets.

A lower frequency of establishment of the net asset value makes it possible 1) to provide more robust assessments of the value of the fund units, by collecting more information on transactions actually executed on the underlying assets, and 2) to limit the first-mover advantage, by accumulating buy and sell orders between two NAVs.

However, it should be borne in mind that the liquidity offered to investors is an important commercial argument: for this reason, for example, insurance companies very often demand that the funds serving as underlying assets for unit-linked policies should offer a daily NAV.

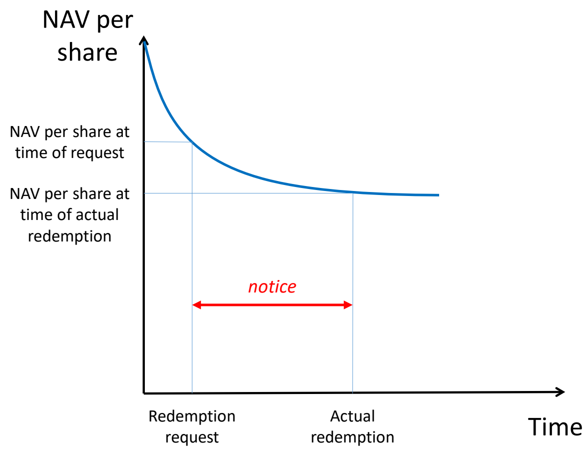
[24] Annex 2, extracted from the April 2020 ESRB report, *A review of Macroprudential Policy in the EU in 2019*, provides a synthesis of the liquidity management tools' availability in the European national legislative and regulatory frameworks.

[25] Annex XIV to AMF Instruction 2011-19, standard template of UCITS prospectuses, and Annex XIV to AMF Instruction 2011-20 for General purpose AIFs (FIVGs), Funds of alternative funds (FFAs) and General purpose professional AIFs (FPVGs).

[26] The period of prior notice does not avert the need to sell assets held by the fund to honour the redemption requests. Yet, in cases of significant market stress, it cannot be ruled out that, for this purpose, despite the period of prior notice, the fund manager might be either forced to use the most liquid assets of the fund or make massive sales. The impact on the fund's risk profile and/or on the market price of the underlying assets could therefore persist.

2.1.2. In ordinary conditions: prior notice of redemption (or subscription)

The period of prior notice of redemption[27] corresponds to a required time lag between the request for redemption and its effective payment, in order to give the fund manager time to obtain the necessary liquidity. In general, redemption is paid out at the net asset value computed on the day of order execution, and not at that of the redemption request (subscriptions/ redemptions are said to be at unknown price).[28]



When the underlying market is not very liquid, the prior notice enables the fund manager to spread the order over several days, so as to not to distort the portfolio to the detriment of the remaining unitholders. The fund manager can thus anticipate coming transactions and have more flexibility to honour redemption requests in optimal conditions (organise the liquidation of positions, manage operational constraints related to the characteristics of various trading markets).
The prior notice therefore enables the fund manager to limit distortion of the liquidity structure of its portfolio, while keeping trading costs under control.

The period of prior notice may be either binding (i.e. mandatory) or incentivising (in that case, additional charges are applied for unitholders who might want to be executed quickly).

In practice, prior notices for subscription or redemption can have a negative impact on fund marketing, insofar as investors perceive them effectively as restrictions on the liquidity offered. They would therefore be especially suitable for the most sensitive strategies in terms of liquidity management (e.g. small- and mid-cap funds, emerging-market funds, and high-yield bond funds).

2.1.3. In ordinary conditions: order settlement time

The AMC can also introduce a time lag between the centralisation of an order and its settlement. That gives it greater visibility over the portfolio reallocation moves to be made. It can thus anticipate portfolio adaptations and limit the resulting distortions. For example, an investor who placed his redemption order at the start of the month could receive his money only at the start of the following month. The NAV adopted for execution of the order must be indicated in the fund's regulatory documentation (e.g. NAV established on the 15th of each month).

The order settlement time may not exceed 10 days for UCITS and 'FIVG' funds.[29] For funds of alternative funds (FFAs), this time is limited to a maximum of 15 days if the NAV frequency is daily, and otherwise 60 days.[30] The same conditional limits apply for general purpose professional AIFs (FPVGs).[31] On the other hand, no regulatory limit is stipulated for funds such as professional specialised funds (FPSs).

[27] The *"period of prior notice"* should be understood as the required time lag between (i) the date of centralisation of a subscription or redemption order and (ii) the date of execution of that order. Therefore, the "period of prior notice" should be distinguished from any time lag which could apply between the date of execution of an order and the date of its settlement and delivery.
[28] The combination of the period of prior notice with other measures such as swing pricing may be able to attenuate the difference between the NAV on the day of the redemption request and that on the day on which the redemption is paid out.
[29] Article 411-20-2 of the AMF GR for UCITS, and Article 422-21-2 for General purpose AIFs (FIVGs) (version applicable at 11 September 2019).
[30] Article 422-251 of the AMF GR (article applicable at 21 December 2013).
[31] Article 423-7 of the AMF GR (article applicable at 21 December 2013).

General conditions of modification of the time factors (2.1.1, 2.1.2, 2.1.3 for UCITS, FIVGs, FFAs and FPVGs):[32]

Provided that a change be made in the prospectus and individual notification be given to unit holders, who may then exert the option to exit the fund free of charge, the fund manager may decide to:

- reduce the net asset value frequency (i.e. increase the time interval between NAVs);
- introduce a period of prior notice of redemption, or increase an existing period of prior notice of redemption;[33]
- increase the number of days between the date of centralisation and the date of settlement.

2.1.4. In stressed conditions: total suspension of subscriptions/redemptions

In cases of exceptional crisis ("when exceptional circumstances require it and if the interest of the shareholders/unitholders or the public so commands", in the words of the Monetary and Financial Code), the AMC may decide the (temporary) total suspension of unit subscriptions and redemptions. This provision concerns all French funds,[34] but must be mentioned in the fund's regulatory documentation in order to be activated. It was used in particular during the financial crisis of 2007-2008, and more occasionally during the summer of 2015. In this case, the fund manager must inform the authorities of his decision immediately.[35]

The possibility of suspending redemptions under the conditions provided for by the regulations is one of the standard statements in the illustrative fund regulations or statutes documents attached in the AMF policies (in the form of a settlement time of up to 30 days).[36] It is not necessarily replicated in the prospectuses (unlike the possibility of suspending subscriptions). Finally, note that Instruction 2011-19 (and its equivalents) provides that, for the introduction in the prospectus of the possibility of triggering the closing and reopening of subscriptions, the unitholders must be informed by any means, but nothing is said concerning the suspension of redemptions.

Articles L. 621-13-2 and L. 621-13-3 of the Monetary and Financial Code also give the Autorité des Marchés Financiers the right to demand the (temporary) total suspension of subscriptions and redemptions on a French UCITS or AIF ("when exceptional circumstances so requires and if the interest of the unitholders, the shareholders or the public so commands"). It exerted this power only once, in 2014 (its decision concerned two funds). The AMF may also demand the lifting of these total suspension measures.

2.2. MEASURES TO BETTER REFLECT THE LIQUIDITY OF ASSETS IN PRICES

The measures described in this section aim to make the investor leaving the fund (entering the fund, respectively) bear the cost of liquidity related to the sale (purchase, respectively) of securities in the portfolio. These mechanisms are especially relevant for funds whose assets have high trading costs and for which subscriptions or redemptions are relatively frequent. It therefore applies mostly to funds having a significant exposure to bond market segments offering the widest bid-offer spreads (high-yield or corporate bonds, convertible bonds, emerging-market securities), or else relatively illiquid equities (small caps or unlisted equities).

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[32] Article 8 of AMF Instruction 2011-19 for UCITS; Article 8 of AMF Instruction 2011-20 for FIVGs, FFAs and FPVGs (versions applicable at 26 November 2019).

[33] NB: The introduction or modification of a period of prior notice of subscription, and the reduction in a period of prior notice of redemption, merely requires notification by any means.

[34] Cf. Articles L.214-7-4, L.214-8-7, L. 214-24-33 and L.214-24-41 of the CoMoFi, concerning UCITS trusts, UCITS funds, FIVG trusts and FIVG funds respectively (versions applicable at 24 May 2019). Unless otherwise provided, these articles are also applicable to FFAs, FPVGs and FES funds with reference to Articles L.214-139, L.214-143 and L.214-163 of the CoMoFi. See also Articles L. 214-67-1 and L. 214-77 of the CoMoFi, for open-ended real estate investment companies and real estate funds respectively.

[35] Cf. Articles 411-20 and 422-21 of the AMF GR, for UCITS and FIVGs respectively. Unless otherwise provided, these articles are also applicable to FFAs, FPVGs and FES funds, with reference to Articles 422-250, 423-1 and 424-1 respectively of the AMF GR.

[36] Cf. Standard Fund Rules: Annex XV of Instructions AMF-2011-19 (UCITS) and AMF-2011-20 (FIVGs): "If, however, in exceptional circumstances, redemption requires the prior realisation of assets included in the fund, this period [the time for settlement of redemptions by the account-keeper] may be extended up to 30 days".

2.2.1. In ordinary conditions: subscription and redemption fees payable to the fund

Subscriptions and redemptions are liability flows which force the manager of a fund to adjust the size of its assets. Depending on the direction of these flows, he must buy or sell financial instruments, and these transactions entail costs (transaction fees and bid-ask spreads). These costs are incurred by the fund as a whole, and not by the investors responsible for the transactions. Investors in the fund run a risk of "performance dilution".

The subscription and redemption fees payable to the fund are charged to investors systematically, on entering and leaving the fund respectively. They are indicated in the prospectus and "serve to offset the costs incurred by the fund to invest or divest the assets entrusted to it".[37] Insofar as these fees are charged systematically, irrespective of the costs actually incurred by the fund, they do not make it possible to specifically manage liquidity crises or massive redemptions: they apply in the same proportions to a modest transaction and a destabilising redemption, and are hard to make acceptable to investors.

NB: Together with subscription and redemption fees not retained by the fund (received by the AMC, or the marketer), these fees form part of the total entry and exit fees indicated in the key investor information document (KIID).

Unit holders must be individually informed of any increase in redemption fees, and offered the possibility of exiting free of charge.[38] An increase in subscription fees, for its part, merely requires notification by any means, provided ex post.

2.2.2. In stressed conditions: Establishment of an in-house valuation when resorting to market price valuation is not possible

For UCITS, if there is no valuation of assets by the conventional procedures based on market prices, *"the management company shall value the financial instruments, derivatives, securities and deposits for which no prices have been observed or quoted on the day the net asset value is determined"* (Article 411-27 of the AMF GR). Accordingly, in the event of a liquidity crisis on a market or the suspension of one or more securities, the AMC, provided that it acts in the interest of the fundholders, may choose not to suspend the fund but to make an independent valuation of the securities concerned. The in-house valuation of assets for which no prices have been observed or quoted is recognised more generally for AIFs.[39]

This obligation is used regularly when market conditions are degraded or when certain securities are no longer listed.[40] However, it must be used cautiously, notably in cases where a significant part of the portfolio has ceased to be listed and where the in-house valuation of the suspended security or securities does not correspond to the price of the security or securities when their listing resumes. In this case, investors entering or leaving the fund in the meantime may have been advantaged, or on the contrary disadvantaged, by comparison with other investors in the fund. The establishment of an in-house valuation may therefore, in certain cases, undermine the principle of equal treatment of unitholders.
This tool concerns all funds and is not necessarily described explicitly in funds' prospectus. Information may be provided in the part of the prospectus describing the fund's valuation rules.

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[37] Annex XIV to AMF Instruction 2011-19, Standard template of UCITS prospectuses, and Annex XIV to AMF Instruction 2011-20 for FIVGs, FFAs and FPVGs.

[38] Article 8 of AMF Instruction 2011-19 for UCITS; Article 8 of AMF Instruction 2011-20 for FIVGs, FFAs and FPVGs (versions applicable at 26 November 2019).

[39] Cf. Article 422-27 of the AMF GR for FIVGs, and by reference for private equity funds (Article 422-120-1), for FFAs (Article 422-250), for FPVGs (Article 423-1), for FPSs (Article 423-23), for professional private equity investment funds (Article 423-48), and for employee savings scheme funds (Article 424-1). No equivalent provisions have been found for real estate funds and specialised financial institutions.

[40] In practice, the in-house valuation mechanism is often adopted by the managers of physical replication ETFs, who have no other choice but to passively track their benchmark, even when degraded market conditions lead to the suspension of certain securities. Active fund managers can make more use of their other holdings to manage their liquidity, so long as they continue to comply with their management objective and the interest of the unitholders.

2.2.3. Generally in stressed conditions: Adjustable fees payable to funds, or anti-dilution levies (ADL)

Via anti-dilution levies (also called adjustable entry and exit fees payable to CIUs, or offsetting subscription/redemption fees), the exiting fundholder (entering fundholder respectively) is charged the costs of sale (purchase respectively) incurred during portfolio reorganisation, without adjusting the CIU’s NAV.

The fund manager shall define a methodology to estimate the total costs related to subscriptions and redemptions, and a rule for the allocation of those costs to entering or exiting fundholders. The fund manager may opt for a "partial" adjustable rights mechanism: in this case the adjustable costs are charged only when the net subscription/redemption flows exceed a certain threshold. The estimated total cost of portfolio reorganisation should be established on the basis of the net balance of subscriptions and redemptions, and may reflect transaction costs, bid-ask spreads and taxes, either by asset class or by market segment, or else security by security.

The methodology and its factors are described in the fund’s anti-dilution levy policy. This document is not public, but may be checked, and must be kept up-to-date by the AMC.[41] The existence of this mechanism, and the general principles of the chosen methodology, must be indicated in the prospectus.[42] Moreover, the anti-dilution levy must be mentioned in the KIID (section on fees), and it is good practice to report the maximum applicable.
Fundholders must be individually informed of any increase in adjustable exit fees payable to the fund, and offered the possibility of exiting without any penalty.[43] An increase in adjustable entry fees payable to the fund, for its part, merely requires notification by any means, provided ex post.

During the crisis, at its meeting of 31 March 2020, the AMF Board decided to relax (temporarily) the procedures that asset management companies had to follow when introducing or increasing anti-dilution levies. In particular, fund managers were no longer bound by the requirement to contact each unit holder individually, and the free-of-charge exit option was suspended. This temporary flexibility may have increased the use of the mechanism.

2.2.4. Generally in stressed conditions: Swing pricing

Swing pricing is a mechanism by which the total costs of portfolio reorganisation resulting from net subscription/redemption flows are allocated to the net asset value of the fund which will be used as a reference for the settlement of said subscription and redemption flows. This is an alternative to anti-dilution levies. Unlike the latter, the penalty for entering or exiting investors does not take the form of a fee, but an adjustment to the net asset value. Only the adjusted, or "swing-priced", net asset value is published: it is the single official NAV of the fund.

The fund manager may decide to merely adopt ‘partial’ swing pricing, i.e. a mechanism triggered only when the net subscription and redemption flows exceed a certain threshold. This is also known as swing pricing with a trigger threshold.
Like for the anti-dilution levy, the methodology for calculation of the total cost of portfolio reorganisation and its factors must be set out in writing in a confidential fund’s swing-pricing policy, kept up-to-date by the AMC. However, the general principles of the mechanism must appear in the prospectus.[44]

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41 Anti-dilution levies are governed by a professional guide of the Association française de la gestion financière (AFG): the Charter of good conduct for swing pricing and anti-dilution levies payable to funds (2014, updated in January 2016).

42 The AFG Charter speaks more generally of "regulatory documentation". However, the illustrative standard template for the prospectus reports subscription/redemption fees payable to funds, specifying the proportion attributable to "particular conditions", which explicitly include anti-dilution levies (cf. Annex XIV to AMF Instruction 2011-19, standard template for the prospectus for UCITS, and Annex XIV to AMF Instruction 2011-20 for FIVGs, FFAs and FPVGs).

43 Article 8 of AMF Instruction 2011-19 for UCITS; Article 8 of AMF Instruction 2011-20 for FIVGs, FFAs and FPVGs (versions applicable at 26 November 2019).

44 Swing pricing is governed by a professional guide of the Association Française de la Gestion Financière (AFG): the Charter of good conduct for swing pricing and anti-dilution levies payable to funds (2014, updated in January 2016).

The establishment of a swing-pricing mechanism in a fund must be reported in the prospectus, and shall be the subject of a notification provided by any means to unit holders (except for private equity funds, for which an individual notification must be given to each holder).[45] However, the details and parameters of the calculations used are not mentioned there, to prevent certain sophisticated investors from arbitraging the mechanisms (e.g. exit in anticipation of a NAV swing-priced upward, or splitting orders to remain below the mechanisms' trigger threshold).

In France, the practice of swing pricing and anti-dilution levies is not governed by the AMF's policy, but by the professional guide written by the Association Française de la Gestion Financière (AFG), and approved by the AMF. This AFG Charter specifies, in its general principles, that swing pricing, like anti-dilution levies payable to funds, is "designed to be used in normal market conditions". It also stipulates that it is the AMC's responsibility to define the fundholders and types of funds concerned (scope of application of the mechanisms), to define the calculation method, to implement it and to monitor it in accordance with the principles of the Charter. Lastly, the AMC must identify and manage potential conflicts of interest resulting from these mechanisms.

The AMF Policy has authorised swing pricing and anti-dilution levies since 2014.[46] The adoption of these mechanisms internationally is very diverse. The Association of the Luxembourg Fund Industry (ALFI) published a professional guide on swing pricing as early as in October 2006.[47] For its part, the US market regulator, the Securities and Exchange Commission (SEC), has authorised the swing-pricing mechanism in its jurisdiction only since November 2018.[48]

The following table summarises the differences between these three mechanisms:

<table>
<tr><th>Characteristics</th><th>Subscription / Redemption fees payable to the fund</th><th>Anti-dilution levy</th><th>Swing pricing</th></tr>
<tr><td>Justification of the cost/level</td><td>No specific obligation</td><td colspan="2">Documented estimate (in a confidential but auditable document) and general principles externalised to fundholders (with no details concerning the parameters)</td></tr>
<tr><td>Requirement for activation</td><td>Any subscription or redemption</td><td colspan="2">Based on the net subscription/redemption balance with or without an activation threshold[49]</td></tr>
<tr><td>Cost allocation</td><td colspan="2">Fees excluding NAV</td><td>In the net asset value</td></tr>
<tr><td>Indication of the level of factors</td><td>Level of fees defined in the prospectus</td><td>Existence indicated in the KIID. Possibly the maximum applicable. No detail concerning the parameters</td><td>No detail concerning the parameters in the prospectus</td></tr>
<tr><td>Consequence of an increase (UCITS and FIVGs[50])</td><td colspan="2">Subscription fees: notification by any means
Redemption fees: individual notification and option to exit without a penalty</td><td>N/A[51]</td></tr>
</table>

45 Cf. AMF Instructions 2011-19 (UCITS), 2011-20 (FIVGs), 2011-21 (FESs), 2011-23 (professional real estate AIFs – OPPCIs), and 2011-22 for private equity funds

46 A note along these lines was presented to the AMF Board on 15 May 2014, and led to the amendment of AMF Instructions 2011-19 (UCITS), 2011-20 (FIVGs), 2011-21 (FESs), 2011-22 (private equity funds) and 2011-23 (OPPCIs). See also the AMF's 2014 Annual Report (p. 25).

47 Cf. ALFI (2011), *Swing pricing (survey, reports & guidelines)*, and AFLI (2015), *Swing pricing, update 2015 (survey)*.

48 Cf. SEC (2016), *Investment Company Swing Pricing (Final Rule)*.

49 In the case of swing pricing, the activation threshold and the amount of centralised subscriptions or redemptions should be covered by privacy measures in the AMC to prevent third parties from taking advantage of the knowledge of very large subscriptions or redemptions to pass orders in the "opposite direction" and take advantage of a NAV timing difference to improve their performance: "*In particular, the asset management company shall not disclose (in writing or verbally) the current levels of the trigger thresholds. For this purpose, it shall especially ensure that the internal information circuits are restricted in order to help protect the confidential nature of this information*."

50 AMF Instructions 2011-19 (UCITS) and 2011-20 (FIVGs).

51 Notification by any means on implementation.

AUTORITÉ DES MARCHÉS FINANCIERS

AMF

2.3. MEASURES TO LIMIT THE IMPACT THAT CERTAIN FUNDS COULD HAVE ON UNDERLYING ASSETS' LIQUIDITY

2.3.1. In ordinary conditions: maximum size of assets under management

Funds may cease to issue units or shares in order to limit their take-up rate on certain assets.[52] This tool is used in particular by ETFs. The triggering conditions, implementation procedures and procedures for fundholders' notification must appear in the prospectus.

2.3.2. In ordinary conditions: Systematic redemption capping, or gates

The systematic capping of redemptions is proposed by certain funds having relatively illiquid investments, such as funds of alternative funds (FFAs – L. 214-141 of the CoMoFi), general purpose professional AIFs (FPVGs – L. 214-146), professional specialised funds (FPSs – L. 214-157) and real estate CIUs (OPCIs – L. 214-61-1). This is a derogation from the principle of issuance and redemption of fund units on demand, as defined for general purpose AIFs (FIVGs), for example, in Articles L. 214-24-29 and L. 214-24-34 of the CoMoFi).

This mechanism can limit redemption amounts as a percentage of the fund's net assets. For OPCIs, for example, capping means that fundholders can only be redeemed for up to 2% of the fund's net assets, and it requires the settlement of redemption requests within a period of one year (AMF Position-Recommendation 2011-25).

A more radical version of this mechanism consists in systematic redemption capping proposed by certain funds having relatively illiquid investments during a given period. Real estate investment funds, for example, are allowed to stipulate a lock-in period or up to ten years in their regulations, and redemption conditions (Article L. 214-61-1 of the CoMoFi).

Likewise, professional specialised funds (FPSs) have full leeway to define the redemption conditions and procedures contractually (Article L. 214-157).
The capping conditions, implementation procedures and procedures for notification of fundholders must appear in the prospectus.

2.3.3. In stressed conditions: side pockets

In the event of a downturn in a specific market segment, UCITS and FIVG asset management companies may decide to segregate the assets in question.[53] This measure concerns assets which suddenly become illiquid, or very difficult to value. It was used in particular on the occasion of the revelation of the Madoff scam by funds which held litigious securities.

In practical terms, the fund is split into two: a "healthy" fund, or replica fund, which takes over the whole portfolio of the original fund except for troubled assets, and a defeasance fund (AIF), managed towards extinction, but which may wait for an upturn in the valuation of the affected investments or a legal outcome allowing compensation of the fundholders.

[52] Cf. Articles 411-20 and 422-21 of the AMF GR, for UCITS and FIVGs respectively. Unless otherwise provided, these articles are also applicable to FFAs, FPVGs and FES funds, with reference to Articles 422-250, 423-1 and 424-1 respectively of the AMF GR.

[53] Cf. Article L. 214-8-7 of the CoMoFi for UCITS and L. 214-24-41 of the CoMoFi for FIVG funds. Unless otherwise provided, the latter article is applicable, by reference to the CoMoFi, to private equity funds (L. 214-27), to funds of alternative funds (L. 214-139), to professional general investment funds (L.214-143), to declared funds (i.e. professional specialised investment funds, professional private equity investment funds, and *sociétés de libre partenariat* (limited partnerships) L.214-152), and to employee savings scheme funds (L. 214-163).

The split operation and the replica fund are not subject to AMF authorisation. On the other hand, the side-pocket AIF must be authorised by the AMF (which has 8 days to do so). Also, the split operation must be reported to it immediately. Investors too must receive a special notification, together with a report justifying the split decision and giving details of the conditions.[54] All funds (except for specialised financial institutions and real estate funds) can perform such a split if conditions require, and this possibility does not need to be indicated in the prospectus.

Each investor in the initial fund receives as many units of the mirror fund as of the side pocket. The mirror fund can then continue to be subscribed to or redeemed, unlike units of the defeasance fund (neither subscription nor redemption). This method allows a proportion of the troubled assets to be allocated to each fundholder, which limits the first-mover advantage and ensures the fair treatment of investors.

2.3.4. In stressed conditions: temporary gates

The redemption capping mechanism (gates) enables redemption requests to be temporarily spread out over time (over several NAVs), once they exceed a certain level pre-determined in the prospectus (e.g. 5% of net assets for a fund with daily NAV). The gates make it possible, in degraded liquidity conditions, to limit the market impact of fire sales, and thus prevent an amplification of the crisis in order to protect the interests of the fundholders. The measure was authorised since 2013 for general purpose professional AIFs (FPVGs) and funds of alternative funds (FFAs).[55] It was extended to all other types of funds by the Sapin 2 Act:[56] UCITS, general purpose investment funds (FIVGs), private equity funds (FCPRs, FCPIs, FIPs, FPCIs), real estate investment funds and employee saving scheme funds (FESs). The establishment of temporary gates is governed by AMF Instruction 2017-05 (for UCITS, FIVGs, private equity funds and FESs) and by AMF Position-Recommendation 2011-25 (for real estate funds, FPVGs and FFAs).[57]

The introduction (or modification) of a gates mechanism must be authorised by the AMF and be covered by an individual notification of the fundholders offering them the right to exit free of charge.[58] The functioning of the mechanism must be described precisely in the prospectus. When gates are activated, the AMC shall notify the AMF as soon as possible (and notify individually the fundholders whose orders have not been fully executed). The AMC must also notify all the fundholders and the public, at least by an explicit statement on its website.

The treatment reserved for non-executed orders (cancellation, deferment, rules of priority) must be described in the organisation's regulations or statutes. Moreover, redemption orders should be executed in the same proportions for all fundholders requesting redemption since the last centralisation date.

Articles L. 621-13-2 and L. 621-13-3 of the CoMoFi give the Autorité des Marchés Financiers the right to demand (temporarily) the partial suspension of subscriptions and redemptions on a CIU or an AIF in exceptional circumstances: indeed, these articles mention the possibility of "demanding suspension […] of the redemption **of** units […]", and not of the redemption **of the** units, which suggests that the suspension could concern only a fraction of the fund's liabilities. To date the AMF has never imposed a partial suspension. These articles also stipulate that the AMF is entitled to demand the lifting of these measures restricting suspensions/redemptions.

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[54] Cf. AMF Position-Recommendation 2011-25 (Guide to CIU monitoring), version applicable at 13 March 2019

[55] Cf. Articles L. 214-146 and D. 214-188 of the CoMoFi for FPVGs; Articles L. 214-141 and D. 214-184 for FFAs.

[56] Cf. Act 2016-1691 of 9 December 2016 on transparency, anti-corruption and economic modernisation (Article 118). The amendments to the CoMoFi concern Articles L.214-7-4 (UCITS trusts), L.214-8-7 (UCITS funds), L. 214-24-33 (FIVG trusts), L. 214-24-41 (FIVG funds), L. 214-67-1 (open-ended real estate investment companies), and L. 214-77 (real estate investment funds). Private equity funds are captured by reference to Article L. 214-27.

[57] See also the recent AMF paper (2019) on "Funds and SICAVs: can the sale of units be temporarily spread out over time?", April.

[58] This provision does not apply to FPCIs.

2.3.5. In ordinary conditions: redemptions in kind

The AMF GR stipulates that redemptions can be performed in cash or in kind.[59] In the latter case, the investor is reimbursed directly in securities: redemptions therefore do not require that the fund liquidate its assets in the market, which reduces the risk of fire sales and of plunging prices.

However, the reimbursement in kind must be accepted by the leaving investor (if the latter receives a representative share of the assets in the portfolio), or even by all the unitholders (otherwise), and may pose practical problems (e.g., impossibility of splitting up the portfolio of assets). Furthermore, to be able to propose subscriptions and redemptions in kind to its fundholders, the CIU must have explicitly provided for this possibility in its regulations or statutes.[60]

The AMF GR also requires a valuation of contributions and redemptions in kind by the statutory auditor of the fund.[61]

In practice, this tool is used mainly for ETFs and for dedicated AIFs corresponding to life insurance unit-linked contracts.

[59] Cf. Articles 411-20 and 422-21 of the AMF GR, for UCITS and FIVGs respectively. Unless otherwise provided, these articles are also applicable to FFAs, FPVGs and FES funds, with reference to Articles 422-250, 423-1 and 424-1 respectively of the AMF GR.

[60] Cf. Articles 3, 4 and 7 of the Standard fund rules (Annex XV) or Articles 8, 9 and 24 of the Standard articles of incorporation (Annex XVI) of AMF Instruction 2011-19 (for UCITS).

[61] Cf. Articles 411-40 and 422-39 of the AMF GR, for UCITS and FIVGs respectively. Unless otherwise provided, these articles are also applicable to FFAs, FPVGs and FES funds, with reference to Articles 422-250, 423-1 and 424-1 respectively of the AMF GR.

3. ANALYSIS OF THE PROSPECTUSES OF FRENCH FUNDS

In the absence of an exhaustive regulatory database capable of tracking the appropriation of the tools by funds, a collaboration between the AMF and the Banque de France has led to the development of a method for automated text analysis of prospectuses. Although this work remains imperfect (for example, certain tools can be used without being indicated in the prospectus, or else certain words could mislead the automatic reading program), it provides promising results, and can offer an initial quantitative estimate of the tools mentioned in prospectuses, and hence disclosed to the fundholders.

A list of keywords and synonyms describing each liquidity management tool has been created based on legislative and regulatory texts and the AMF Policy,[62] but also based on the observation of fund prospectuses chosen as examples, with the final list being proofread by the AMF Asset Management Directorate.[63] On each selected analysis date, an extraction of all the prospectuses of French funds is produced (these documents must be sent by fund managers to the AMF as soon as they are updated). As an example, this extraction used for this article consisted of 9,899 prospectuses of live funds at 31 December 2019.

The computer program therefore searches, in this vast documentation database, for occurrences of words indicating the establishment or availability of a liquidity management tool, and associates them with the corresponding fund units. The program takes one night to scan the entire prospectus database.

The method used to search for liquidity management tools is based on semantic rules determined beforehand by the teams at the AMF and Banque de France (a rule-based classification method). However, problems due to the size of the prospectus database and the lack of a standardised information structure in the prospectuses are fundamental constraints in the method employed. Accordingly, this text analysis has limitations which are due to the possibility of finding false positives among the results, despite the unequivocal nature of the keywords searched for (for example, a prospectus in which a tool might be mentioned but not put in place, or a series of words observed as identifying a liquidity management tool referring to another mechanism adopted by the fund);[64] or false negatives, because the list of synonyms or words chosen to describe a tool will never be exhaustive. In order to reduce these statistical errors, it is planned to combine the current rule-based method with supervised statistical classification methods in a forthcoming improvement of the LMT search tool.

The variables specifying the timing of redemptions or of order execution are undergoing analysis but are not presented here since they require going beyond the mere analysis by character strings. Nearly all the funds indicate in the prospectus the sequence of execution of a redemption order. The words relating to prior notice and settlement times are therefore systematically mentioned and the indicator variables coding for their presence are not very informative. On the other hand, it will be far more interesting to retrieve the figures corresponding to these prior notices and times (in number of days). This is a very promising track for further research, which will be included in the next version of the search tool. Table 1 summarises the liquidity management tools, indicating whether they must be mentioned in prospectuses, and whether they could be analysed in this article.

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[62] Cf. in particular the mandatory or optional indications when they are available in the illustrative standard template for the prospectuses provided by the AMF – Annex XIV to AMF Instruction 2011-19, standard template for UCITS prospectuses, and Annex XIV to AMF Instruction 2011-20 for FIVGs, FFAs and FPVGs.

[63] For example, the words searched for in the prospectuses to analyse swing pricing are "swing pricing", "swing-pricing", "adjustment of net asset value", "adjustment of NAV", "adjusted net asset value" and "adjusted NAV".

[64] For example, the words searched for in the prospectuses to analyse the anti-dilution levy mechanism are variants of "adjustable exit fee" and "adjustable entry fee", but it is possible that it may detect adjustable fees which are not related to the mechanism searched for.

Table 1: Presentation of the tools in prospectuses and analysis results where applicable.

Tools	Mention in the prospectus	Analysed	% of the number of share classes	% of the Total Net Assets
Mechanisms enabling to slow down the asset sales				
NAV computation frequency	Yes	Yes	-	-
Redemption notice	Yes	Work in progress	-	-
Subscription notice	Yes	Work in progress	-	-
Settlement period	Yes	Work in progress	-	-
Possibility to suspend redemptions	Yes	Yes	71%	82%
Mechanisms to reflect the impact of liquidity on prices				
Commissions de souscriptions/rachats acquises aux fonds	Yes	No	-	-
Internal valuation in case official valuation no longer available	No	No	-	-
Anti-dilution levies	Yes	Yes	1%	2%
Swing-pricing	Yes	Yes	7%	6%
Mechanisms to limit the impacts on assets' liquidity				
Cap to the AuM	No	No	-	-
Systematic or temporary redemption gates	Yes	Yes	7%	9%
Side pocket	Yes	Yes	0,3%	0,2%
Possibility to offer redemption in kind	Yes	Yes	65%	74%

Source: Prospectus Analysis, AMF-Banque de France.

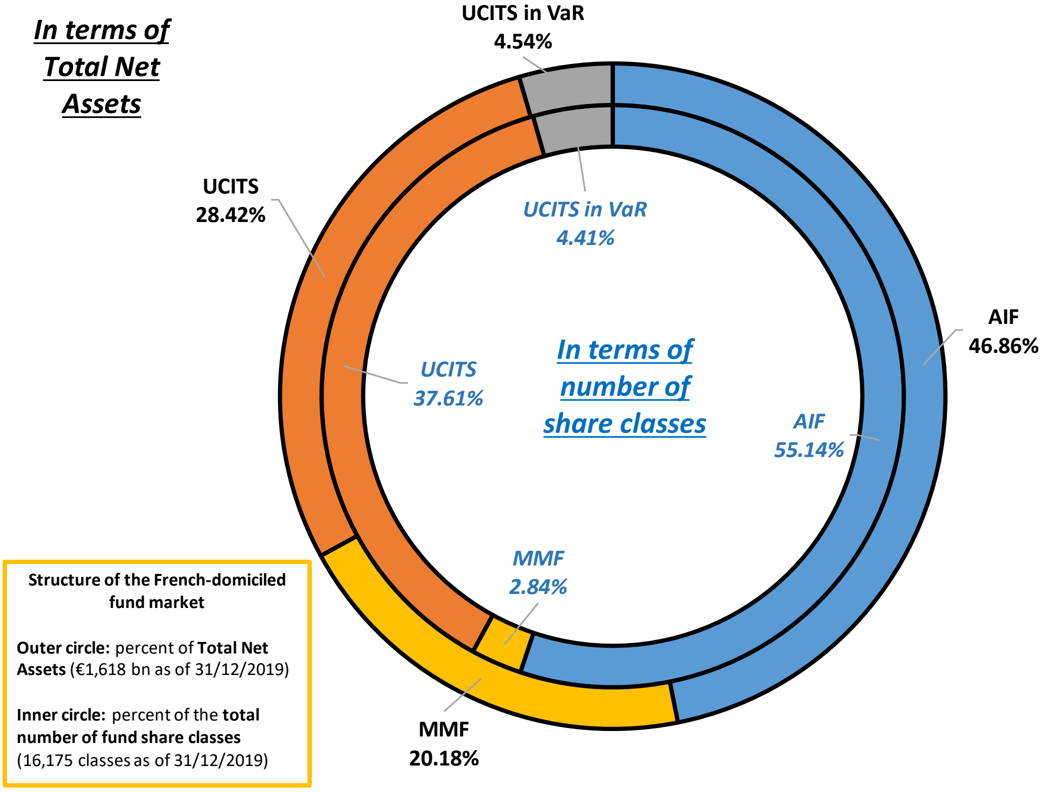
The following graphs show the results obtained for all French funds based on the existing prospectuses at 31 December 2019. A retrospective analysis and periodic follow-up could supplement this first stage (the prospectus databases have already been extracted at end-2017, end-2018 and mid-2019).

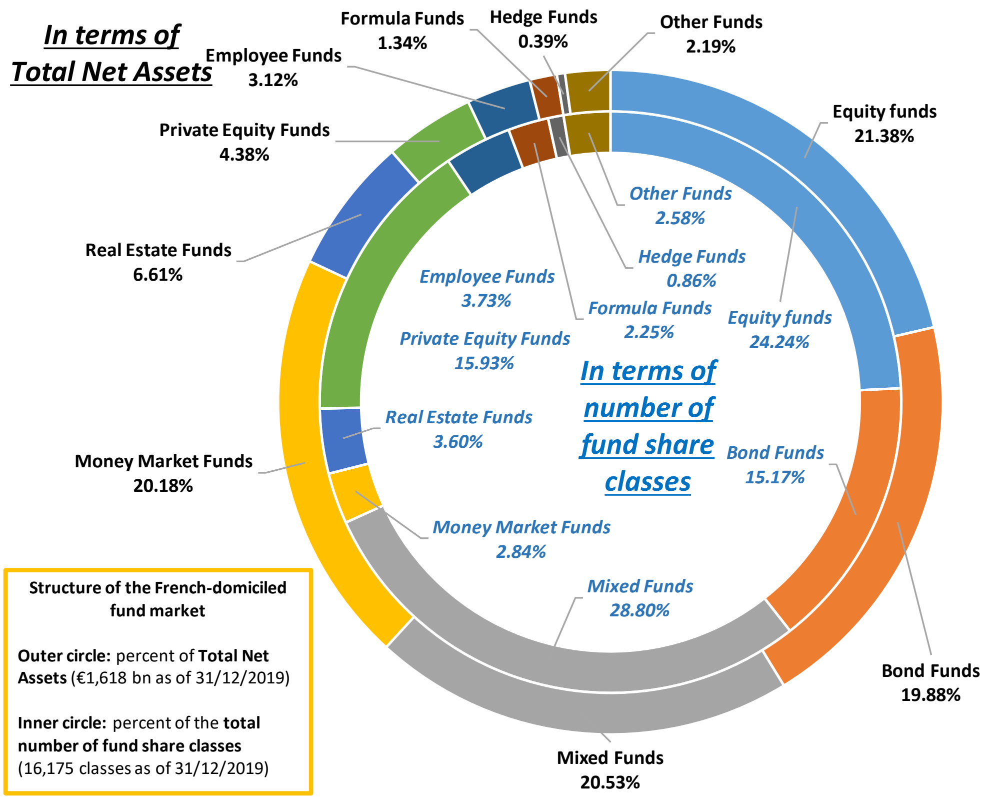
At the end of 2019, the AMF identified 9,899 prospectuses of French funds, of which 9,768 are usable (the difference being due to errors related to the format of the files or the absence of code making it possible to identify the funds in the prospectuses – only 2% of the cumulated total net assets is dropped for the analysis). One notes that in a given prospectus several fund share classes are often mentioned, identified by means of their ISIN code or equivalent: these fund share classes are assumed to be associated with the same liquidity management tools. In all, these prospectuses correspond to the description of 16,461 fund share classes, of which 16,175 are live at year-end 2019. In what follows, therefore, the analysis concerns this scope of live French funds at 31 December whose prospectus is readable by the computer programme.

As a reminder, the structure and characteristics of French funds are presented in Figure : at the end of 2019, French funds included in the analysis represent €1,618 billion and 16,175 fund share classes. 47% of the total net assets consists of alternative investment funds (AIFs, 55% in number of share classes) and 33% undertakings for collective investment in transferable securities (UCITS, 42% in number of share classes), of which 5% are UCITS which make non-marginal use of arbitrage strategies and calculate their total risk by the Value-at-Risk method (VaR UCITS, 4% in number of share classes). MMFs, for their part, represent 20% of net assets and 3% of the number of share classes.

In terms of net assets, the leading funds are equity funds (21% of the net assets of French funds), diversified funds (21%), money market funds (20%) and bond funds (20%). In what follows, the description of the presence of tools in the prospectuses is presented taking into consideration the order of preponderance of each category of asset class in the total net assets of the French funds.

Figure 1: Characteristics of French funds at end-2019, in terms of cumulated total net assets and number of fund share classes





Source: Bio2, AMF.

3.1. FREQUENCY OF NET ASSET VALUES

The intervals between net asset values are analysed here, building on the AMF database which lists these contractual data (BIO2), and without using the automatic prospectus reading tool described in this article. It appears that while the great majority of equity funds (89% of their net assets), bond funds (88%) and money market funds are funds with daily valuation, the funds that could be described as less liquid preferably choose a weekly valuation (50% of the net assets of employee saving scheme funds invested in securities of their firm), a monthly valuation (50% for hedge funds), a quarterly valuation (68% of the net assets of real estate funds), or even a half-yearly valuation for 51% of the net assets of venture capital funds.

Table 2: Frequency of net asset values by asset class, as a % of the number of share classes of French funds

NAV Frequency % of the Total Net Assets for each category of funds	Daily	Twice a week	Weekly	Every 10 days	Every two weeks	Twice a month	Monthly	Twice a Quarter	Quarterly	Twice a year	Yearly	Unknown	**Number of share classes in each category**
Equity Funds	83%	0%	12%	0%	1%	0%	0%	0%	0%	0%	0%	2%	**3 921**
Bond Funds	80%	0%	14%	0%	0%	0%	2%	0%	1%	0%	0%	3%	**2 453**
Mixed Funds	58%	0%	29%	0%	5%	1%	2%	0%	2%	1%	0%	2%	**4 658**
Money Market Funds	86%	0%	10%	0%	0%	0%	1%	0%	0%	0%	0%	3%	**459**
Real Estate Funds	0%	0%	0%	0%	0%	7%	3%	1%	60%	27%	0%	2%	**583**
Private Equity Funds	0%	0%	0%	0%	0%	0%	2%	0%	34%	59%	0%	5%	**2 577**
Employee Funds	27%	0%	47%	1%	0%	3%	8%	0%	5%	7%	0%	1%	**603**
Formula Funds	44%	1%	26%	0%	3%	4%	19%	0%	1%	0%	0%	3%	**364**
Hedge Funds	27%	0%	17%	0%	4%	0%	34%	0%	12%	1%	0%	4%	**139**
Other Funds	33%	0%	12%	0%	0%	1%	10%	0%	25%	13%	0%	6%	**418**
TOTAL	**55%**	**0%**	**17%**	**0%**	**2%**	**1%**	**3%**	**0%**	**9%**	**11%**	**0%**	**3%**	**16 175**

Source: Bio2, AMF.

Note for the reader: Each row corresponds to a fund category. The sum of the percentages on each row equals 100% (possibly rounded off). Each cell indicates the percentage of funds in the row which report at the frequency indicated in the column title: for example, 83% of equity funds (in terms of the number of share classes) have a daily NAV. The colour code corresponds to a gradient ranging from green (0%) to red (100%).

Table 3: Frequency of net asset values by asset class, as a % of the total net assets of French funds

NAV Frequency % of the Total Net Assets for each category of funds	Daily	Twice a week	Weekly	Every 10 days	Every two weeks	Twice a month	Monthly	Twice a Quarter	Quarterly	Twice a year	Yearly	Unknown	**TOTAL NET ASSETS of each category (€ Mn)**
Equity Funds	89%	0%	8%	0%	0%	0%	0%	0%	0%	0%	0%	2%	**345 791**
Bond Funds	88%	0%	8%	0%	0%	0%	1%	0%	0%	0%	0%	2%	**321 641**
Mixed Funds	77%	0%	19%	0%	0%	0%	1%	0%	1%	0%	0%	1%	**332 103**
Money Market Funds	96%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	2%	**326 403**
Real Estate Funds	0%	0%	0%	0%	0%	14%	5%	1%	68%	11%	0%	1%	**106 966**
Private Equity Funds	0%	0%	0%	0%	0%	0%	1%	0%	41%	51%	0%	7%	**70 801**
Employee Funds	40%	0%	50%	1%	0%	4%	5%	0%	0%	0%	0%	0%	**50 516**
Formula Funds	56%	1%	30%	0%	6%	1%	4%	0%	0%	0%	0%	3%	**21 596**
Hedge Funds	17%	0%	8%	0%	1%	0%	50%	0%	18%	2%	0%	3%	**6 360**
Other Funds	46%	0%	17%	0%	0%	1%	13%	0%	16%	6%	0%	1%	**35 385**
TOTAL	**75%**	**0%**	**10%**	**0%**	**0%**	**1%**	**1%**	**0%**	**7%**	**3%**	**0%**	**2%**	**1 617 562**

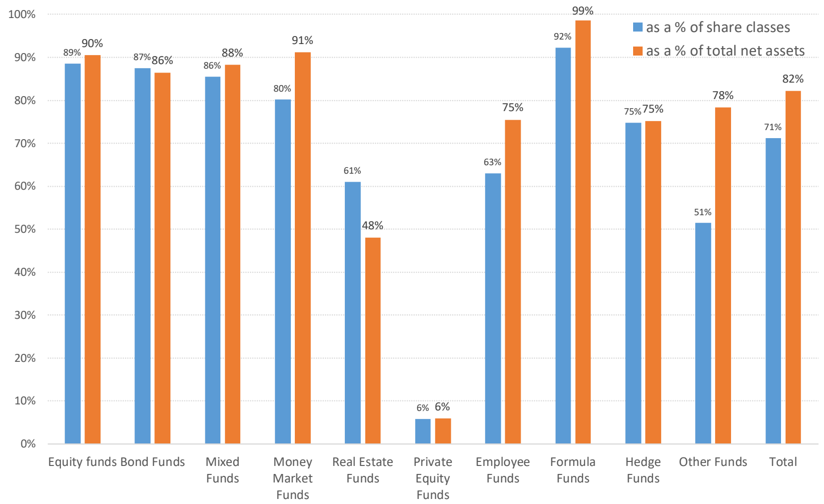
Source: Bio2, AMF.

Note for the reader: Each row corresponds to a fund category. The sum of the percentages on each row equals 100% (possibly rounded off). Each cell indicates the percentage of funds in the row which report at the frequency indicated in the column title: for example, 89% of equity funds (in terms of total net assets) have a daily NAV. The colour code corresponds to a gradient ranging from green (0%) to red (100%).

3.2. SUSPENSION OF REDEMPTIONS

The possibility of suspending redemptions in stressed conditions must be indicated in the fund's regulations but not necessarily in its prospectus. However, French funds massively mention this possibility in their prospectuses (82% of net assets), notably structured funds (99% of their net assets), money market funds (91%) and equity funds (90%). As a reminder, apart from this decision by the fund managers, the Autorité des Marchés Financiers is also entitled to demand the (temporary) total suspension of subscriptions and redemptions when exceptional circumstances so require and if the interest of the unitholders, the shareholders or the public so commands.

Figure 2: Indication in the prospectus of the possibility of suspending redemptions, in number of funds' share classes and in total net assets, by fund type

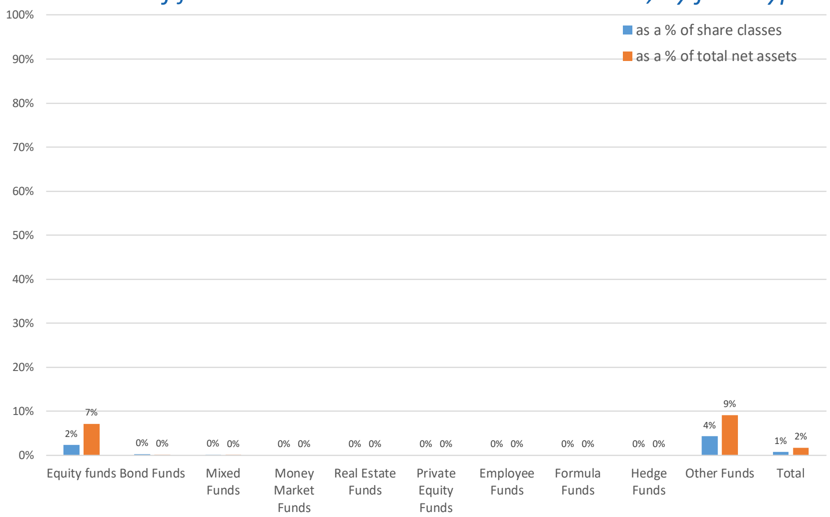


Source: Prospectus Analysis, AMF-Banque de France.

3.3. ANTI-DILUTION LEVIES, SWING PRICING AND GATES

Of the liquidity management tools, the anti-dilution levy mechanism appears to be very marginally used by French funds: they are found significantly only for equity funds (7% of net assets) and for other funds (9%).

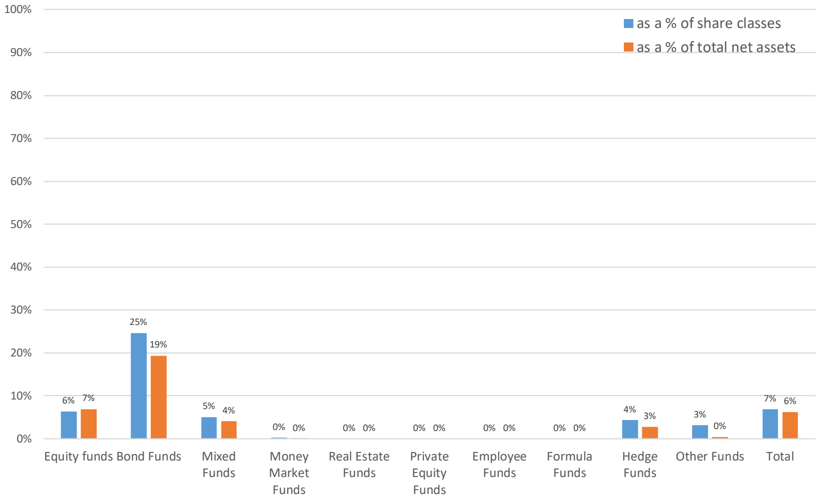
Figure 3: Indication in the prospectus of an anti-dilution levy mechanism, in number of funds' share classes and in total net assets, by fund type



Source: Prospectus Analysis, AMF-Banque de France.

Conversely, the use of swing pricing appears more widespread, as 6% of French funds (in terms of total net assets) have adopted it. These are mostly bond funds (19% of their net assets) and equity funds (7%).

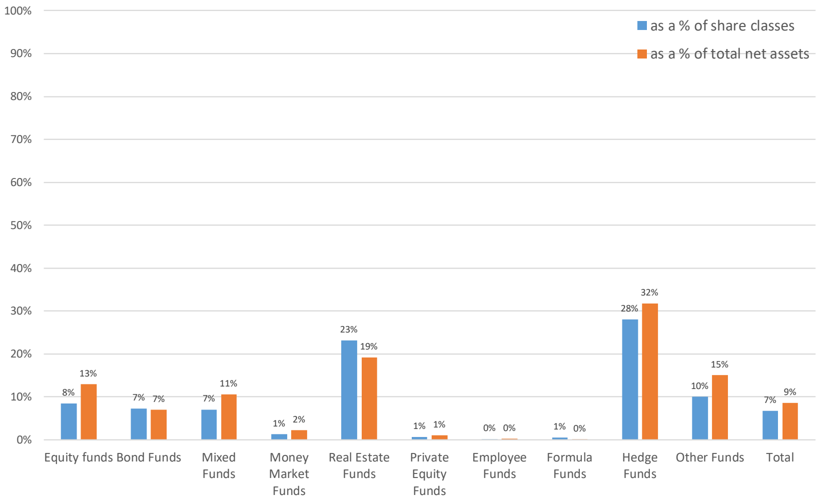
Figure 4: Indication in the prospectus of a swing-pricing mechanism, in number of funds' share classes and in total net assets, by fund type



Source: Prospectus Analysis, AMF-Banque de France.

Regarding gates (redemption capping), it should be noted that the proposed analysis does not make it possible to distinguish between temporary gates and permanent gates: both these tools are therefore analysed together. The funds considered least liquid use them more: gates concern 32% of the net assets of hedge funds and 19% of the net assets of real estate funds.

Figure 5: Indication in the prospectus of a gates mechanism, in number of funds' share classes and in total net assets, by fund type

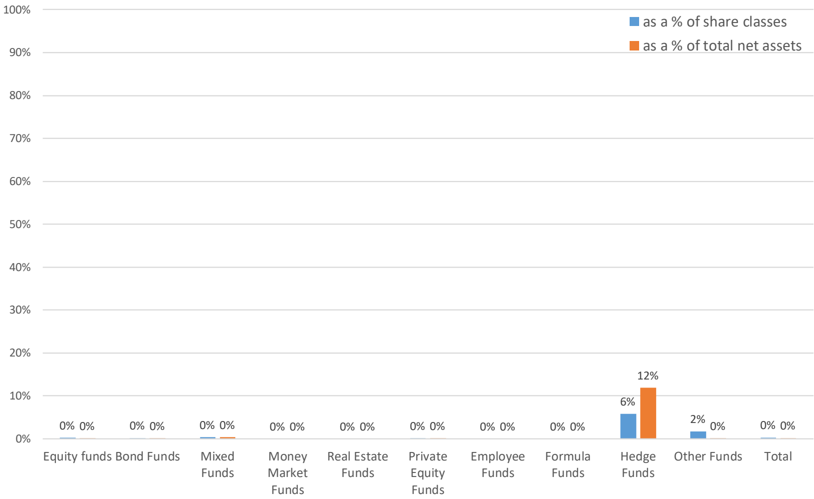


Source: Prospectus Analysis, AMF-Banque de France.

3.4. SIDE POCKETS

The analysis of the indication of a side-pocket mechanism in a prospectus does not indicate whether French funds are able to use such measures (i.e. split the fund by spinning off the illiquid securities):indeed this possibility is available to all funds without there being any need to have indicated it in the prospectus (see 2.3.4). However, it gives an indication concerning the number (and value) of fund share classes which indicate in their prospectus that they are associated with a defeasance fund (resulting from a previous split). For example, out of the total population, only 0.3% of fund share classes are associated with a side pocket (0.2% in terms of total net assets): these are mostly hedge funds (12% of net assets).

Figure 6: Indication of the existence of a side pocket or defeasance fund associated with the fund, in number of funds' share classes and in total net assets, by fund type

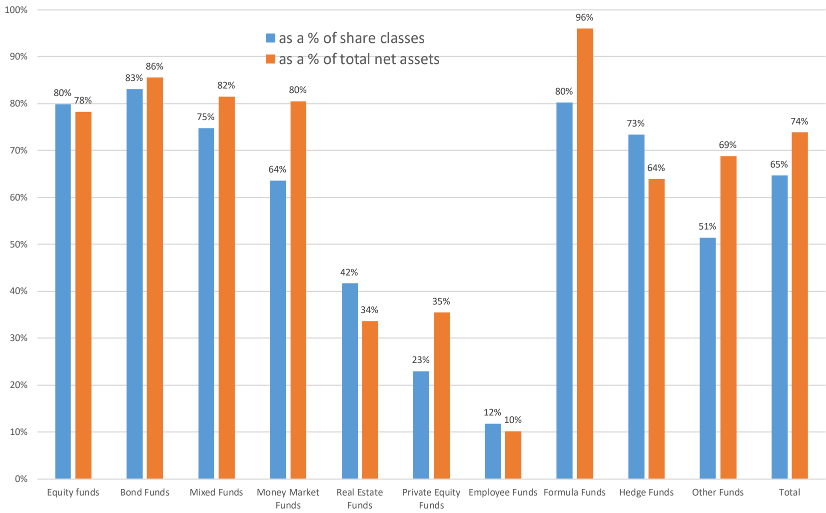


Source: Prospectus Analysis, AMF-Banque de France.

3.5. REDEMPTIONS IN KIND

Lastly, the very high proportion of funds indicating in their prospectus the possibility of redemption in kind subject to the approval of the fundholders (65% of fund share classes and 74% of total net assets) could be due to the fact that this option is included in the AMF's standard illustrative template of UCITS's prospectuses , which many asset management companies modify only marginally. Moreover, we note that structured funds (96% of net assets) and bond funds (86%) especially indicate that they propose this type of exit.

Figure 7: Indication of the conditions of reimbursement in kind, in number of funds and net assets, by fund type

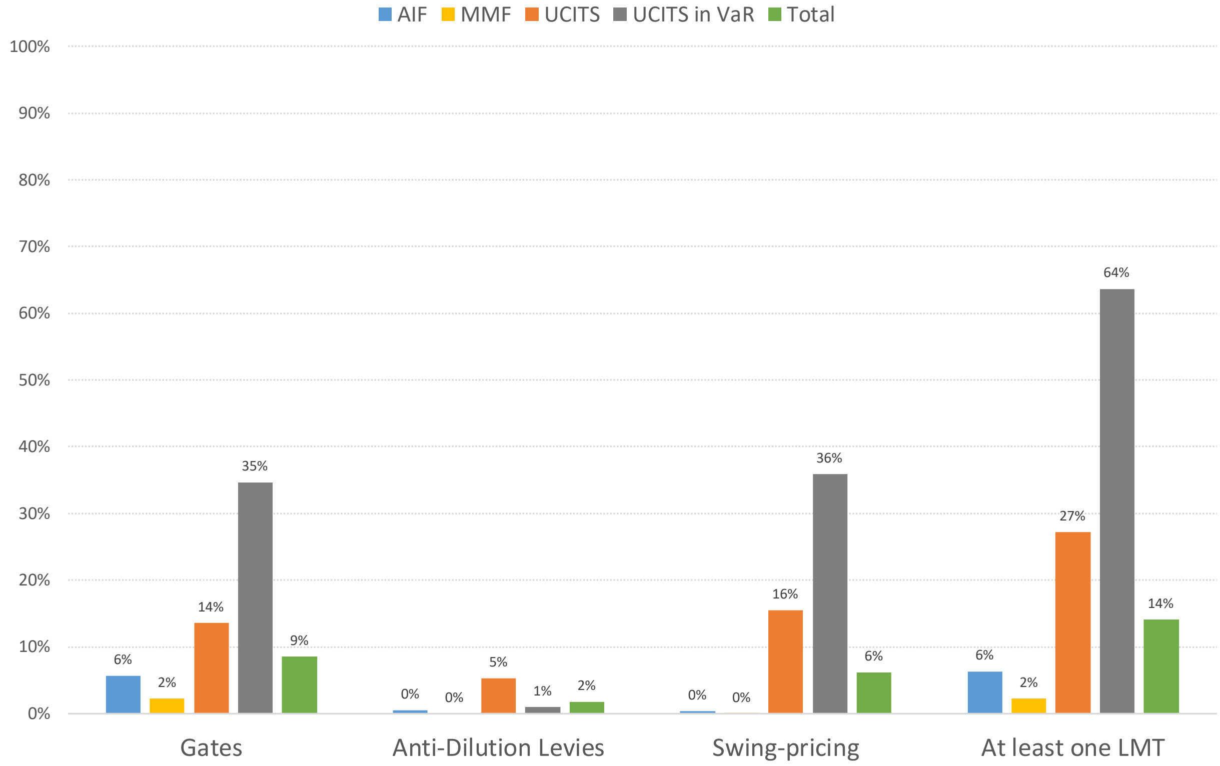


Source: Prospectus Analysis, AMF-Banque de France.

3.6. GENERAL RECAP

In the end, 14% of French funds (in terms of total net assets) indicate in their prospectus the establishment of at least one liquidity management tool (i.e. gates, swing pricing or anti-dilution levies), at end-December 2019. These tools are adopted more often by UCITS (27% of their total net assets, 64% for VaR UCITS) than by AIFs (6% of their net assets).
We mostly find gates (9% of total net assets) and, to a lesser extent, swing pricing (6%). ADLs are very marginal.

Figure 8: Indication in the prospectus of liquidity management tools by major fund category, as a % of total net assets



Source: Prospectus Analysis, AMF-Banque de France.

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Annex 1: Acronyms used

ADL	*Anti-Dilution Levy* Adjustable rights payable to the fund
AFG	Association française de la gestion financière (French asset management association)
AIFMD	AIFM Directive (*Alternative Investment Fund Managers*)
AMF	Autorité des Marchés Financiers (French market regulator)
CoMoFi	Code monétaire et financier (French Monetary and Financial Code)
KIID	Key Investor Information Document
ESMA	European Securities and Markets Authority
ESRB	European Systemic Risk Board
ETF	Exchange Traded Fund
FCPI	*Fonds commun de placement dans l'innovation* (retail venture capital investment fund, in the AIF category)
FCPR	*Fonds commun de placement à risques* (retail private equity investment fund, in the AIF category)
FES	*Fonds d'épargne salariale* (employee saving scheme fund)
FFA	*Fonds de fonds alternatifs* (fund of alternative funds, in the AIF category)
AIF	Alternative Investment Fund -> CIU subject to the AIFM Directive
FIP	*Fonds d'investissement de proximité* (retail local private equity investment fund, in the AIF category)
FIVG	*Fonds d'investissement à vocation générale* (general purpose alternative investment fund, in the AIF category)
FPCI	*Fonds professionnel de capital investissement* (professional private equity investment fund, in the AIF category)
FPS	*Fonds professionnel spécialisé* (professional specialised investment fund, in the AIF category)
FPVG	*Fonds professionnel à vocation générale* (general purpose professional alternative investment fund, in the AIF category)
LMT	Liquidity Management Tool
MMF	Money Market Fund -> CIU subject to the MMF Regulation (MMFR)
MMFR	Money Market Funds Regulation
OFS	Organisme de financement spécialisé (specialised financial institution)
IOSCO	International Organization of Securities Commissions
CIU	Collective Investment Undertaking (fund or trust)
OPCI	Organisme de placement collectif immobilier (real estate collective investment undertaking, in the AIF category)
UCITS	Undertakings for Collective Investment in Transferable Securities -> CIU subject to the UCITS Directive (UCITSD)
AMF GR	AMF General Regulation
AMC	Asset Management Company
UCITSD	UCITS Directive (Undertakings for Collective Investment in Transferable Securities)
EU	European Union
NAV	Net Asset Value per share (NAV per share)

Annex 2 : Availability of liquidity management tools in EU Member States

Table 4.3.A

Availability of liquidity management instruments in EU Member States

	Gates	Side pockets	Anti-dilution levy	Redemp-tion fees	Redemp-tion-in-kind	Suspen-sion of redemp-tions	Swing pricing	Short-term borrowings	Mandatory liquidity buffers	Side letters	Other tools or measures
AT		•		•	•	•	•	•	•	•	
BE	•		•			•	•				
BG						•		•			
CY	•	•	•	•	•	•	•	•			
CZ						•		•			
DE				•	•	•		•	•		•
DK						•					
EE	•	•	•	•	•	•	•	•		•	
ES	•	•		•	•	•	•	•	•		•
FI				•	•	•	•	•			
FR	•	•	•	•	•	•	•	•			•
GR						•		•			
HR					•	•					
HU						•					
IE	•	•	•	•	•	•	•	•		•	
IS						•		•			
IT	•	•	•	•	•	•		•			•
LI	•	•	•	•	•	•	•	•		•	
LT	•	•		•		•		•			
LU	•	•	•	•	•	•	•	•		•	•
LV						•					
MT	•	•			•	•		•		•	
NL	•	•	•	•	•	•	•	•	•	•	
NO	•	•				•	•				
PT	•		•	•	•	•	•	•			•
RO	•		•			•		•			•
SE						•					
SI		•			•	•		•			
SK	•					•		•	•		
UK	•		•	•	•	•	•	•			•

Source: ESRB.

Source : ESRB (2020), A review of macroprudential policies in the EU in 2019, p.114

Annex 3: Description of the text search method

For each prospectus, the computer code will perform two main tasks:

- Recognise the identification codes of the fund class shares concerned by the prospectus in question;
- Identify references to a liquidity management tool, and associate them with the corresponding fund class shares code.

These steps will be replicated for all the prospectuses of live funds at a determined date, in order to establish a precise database of LMTs available at the level of each fund unit.

The text search process breaks down into two separate stages. First, the tool scans all the prospectuses in search of character strings contained in a list of expressions specifically characterising the various liquidity management tools. This "fixed" search is similar, for example, to the text search tools in office software (even though it is improved in that it ignores character strings which may appear by chance in other words).[65] The entire character string (spaces, definite and indefinite articles, diacritical marks, etc.) must be present for the computer program to detect a liquidity management tool. The list of expressions thus includes miscellaneous variants (singulars, plurals, verb conjugations and possible spelling or grammatical mistakes). The exhaustive list of these character strings (and the specific tools with which they are associated) is available from the authors on request.

A more flexible search is realised, as a second step, adding semantic search concepts to the data exploration. Data exploration methods make it possible to generate meaning from a set of data of apparently disparate appearance and hence create semantics. The search method used here is based on classification rules determined beforehand by the teams at the AMF and Banque de France (a rule-based classification method).

The reference to an LMT in a prospectus may be characterised by one or more fundamental expressions. These expressions are composed of a few essential terms which characterise liquidity management tools. These words and their synonyms are classified and stored in the form of a dictionary defined beforehand and used for the search. The tool then carries out a combined search for the essential terms characterising liquidity management tools, and will report the presence of a tool if and only if these essential terms or their synonyms appear jointly in a sentence and in a restricted scope of words (this scope is limited to ten words in the tool).

For example, in the phrase "redemption capping"[66], the words "capping" and "redemption" are the essential terms to indicate the existence of a gate mechanism, but obviously the prospectus could similarly indicate that the "fund manager has the right, in exceptional circumstances, to cap subscriptions and redemptions". That is why we select synonyms (e.g. "exit" and "redemption") and elementary character strings for the joint search (e.g. "cap" as the root of the expressions "a cap", "capping", "to cap", etc.). The joint presence of synonyms of the words "capping" and "redemption" in a restricted scope (10 words in our tool) means that the presence of a gate mechanism can be attributed to this expression and to the prospectus in question.

We proceed in the same way when more than two keywords are needed for the identification of a mechanism. Again in the case of the gate mechanism, this tool could be identified in a prospectus when the phrase "partial suspension of redemptions" appears. In this case the three words of the phrase ("suspension", "partial" and "redemptions") are important for the identification of the LMT. The search tool must therefore jointly find synonyms of these three words in a restricted scope, in order to detect this liquidity management tool.

Going back to the previous examples, the "exit" string is declared as a synonym of the "redemption" string, and "suspend" and "partially" are declared as synonyms of the "suspension" and "partial" strings. The search tool will thus detect a phrase such as "exit capping" or "partially suspend redemptions" to identify a gate.

[65] For example, the tool will not report a "gate" in a prospectus in which these four letters are present only as a sub-unit of the word "aggregate".

[66] These words were searched in French language in the computer code.

In order to eliminate a maximum of "systematic" false positives, statistics are established on the words located in the vicinity of the keywords ("word clouds"): this makes it possible to identify cases where the keywords searched for are used in other contexts, and thus refine the program's discriminating ability by adapting the expressions. This step involves establishing frequency statistics on joint occurrences of keywords and the words present within a "radius" of 3 words around the latter. The aim of this analysis is to extract a maximum of information around keywords, while stop words[67] are neglected during the search. This step makes it possible, for example, to pay special attention when identifying the redemption capping (or "gate") tool. The joint presence of the words "capping" and "redemption" and their synonyms in a restricted scope enables the software to attribute a gate mechanism to the prospectus in question. However, if, in this same restricted scope, the phrase also included a synonym of the word "fee", then the meaning of the phrase would be completely changed. This phrase, consisting of the words "fee", "redemption" and "cap" would no longer refer to redemption capping, but to the capping of redemption fees. Thus the presence of any synonym of the word "fee" will prevent identification of the phrase searched for as a "gate" in the tool.

The search rules are described in Annex 4 in the form of diagrams. The dictionary of synonyms can be obtained from the authors on request.

However, problems due to the size of the prospectus database and the lack of a standardized information structure in the prospectuses are fundamental constraints in the search method employed. Despite the complementary analysis by word clouds, this text analysis has limitations which are due to the possibility of finding among the results false positives (despite the choice of keywords that are as unambiguous as possible) or false negatives (because the list of synonyms or words chosen to describe a tool will never be exhaustive). In order to reduce these statistical errors, it is planned to combine the current rule-based method with supervised statistical methods for classification of liquidity management tools in a subsequent version of the LMT search tool.

[67] A stop word is a word which is so common that it is unnecessary to index it or use it in a search. Examples of such stop words are "the", "of", "of the", "this", etc.

Annex 4: Description of rules for identification of "flexible" text search

The second search method is based on classification rules determined beforehand by the teams at the AMF and Banque de France (a rule-based classification method). Several iterations allowed us to improve the identification power of the programme. These classification rules are presented below in the form of diagrams for each of the liquidity management tools searched for in this second stage.

Figure 9: Classification rule – Side pocket

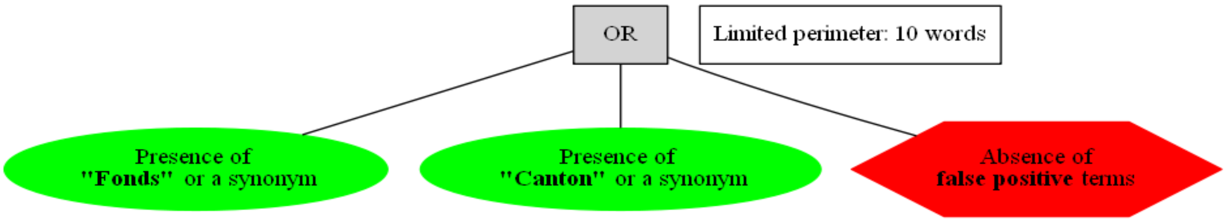

Figure 10: Classification rule – Suspension of redemptions

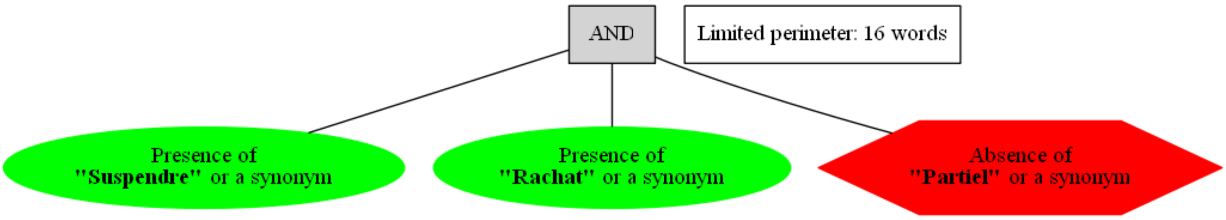

Figure 11: Classification rule – Suspension of subscriptions

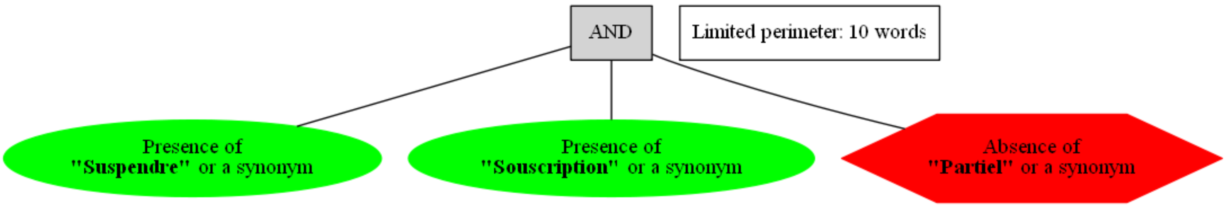

Figure 12: Classification rule – Redemption capping (gates)

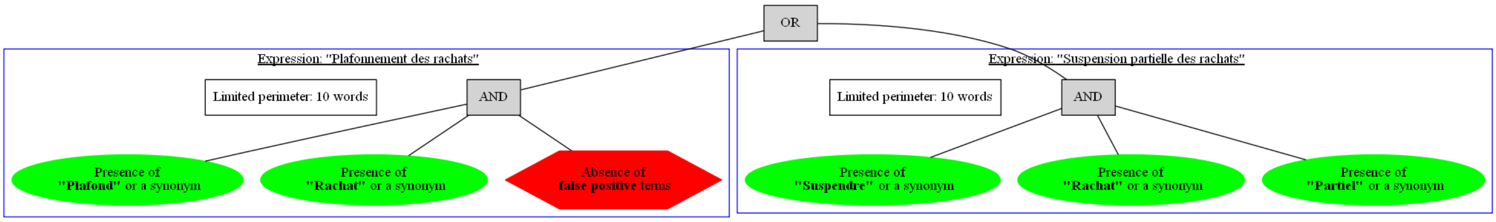

Figure 13: Classification rule – Subscription capping (gates)

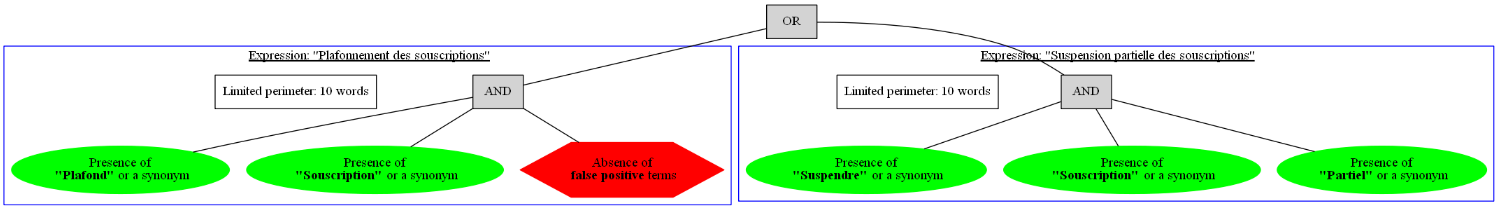

Figure 14: Classification rule – Anti-dilution levy