Research paper

Is illiquidity risk during a market crisis underestimated?

Pierre Astolfi, University Paris 1
Arnaud Thauvron, University Paris-Est Créteil
Marc Desban, University Paris-Est Créteil
Sylvie Lecarpentier-Moyal, University Paris-Est Créteil

The views expressed are those of the authors alone.

Abstract

The notion of illiquidity risk is widely described in the literature. However, this risk often seems to be seen as specific to the asset itself (diversifiable risk requiring no excess return), and not as systematic risk (market risk requiring a higher return).

We seek to increase our understanding of illiquidity in a major financial crisis using an exploratory survey of financial analysts and valuation analysts in France. Indeed, not all of the lessons from the 2008 crisis were learned, leading to a misapprehension of illiquidity risk as a systematic risk, i.e. a risk that can affect all asset classes by contagion. Therefore, the effects of extreme scenarios, such as a major financial crisis, are probably underestimated.

Preamble

Illiquidity has been the subject of much academic and industry research. The reference model for financial market operations (Markowitz, 1952) is based on the assumption that invested assets are liquid, but, in practice, investors incur liquidity risks. Thus, illiquidity is seen as an undeniable manifestation of a form of market failure.

More specifically, liquidity is the ease with which an asset can be converted into cash. This notion is linked to the idea of a market, since it brings together supply and demand, even if it is not necessarily on an organised market. It is represented by the cost of executing a transaction immediately (Amihud et Mendelson, 1986). This means that liquidity is linked to the notion of "marketability[1]". All else being equal, a liquid asset is more valuable than the same asset if it is not liquid, since it can be converted into cash quickly and at less cost. The costs arising from a lack of liquidity may be linked to the discount given to ensure a quick sale, or the time spent waiting for a buyer. The matter of time is critical, as is often the case in finance.

Generally speaking, illiquidity discounts are found in the following cases:

- when valuing unlisted companies (Hertzel and Smith (1993), Koeplin *and al.* (2000), Kooli *and al.* (2003), Zanni (2013));
- when accounting for restrictions on selling the asset in question, such as contractual lock-up provisions or a shareholders' agreement that restricts sales (Johnson (1999), French Tax Guide (2006), IPEV Guide (2018), tax case law cited in SFEV (2018));
- or when accounting for particular situations, such as listed securities with limited trading volumes, or during a major financial crisis (Khandani and Lo (2007; 2011), Ang *and al.* (2014), Green (2015)).

The scale of the discounts reported varies depending on the research, ranging from about 15 % (Kooli *and al.*, 2003) to more than 40 % (Emory *and al.*, 2002). Other authors suggest increasing the discount rate to account for illiquidity, with a wider spread for debt securities (Green, 2015) or "liquidity betas" (Pastor and Stambaugh, 2003).

According to the literature, illiquidity is seen as linked to either the general state of the market (making it a parameter of systematic risk) or to the specific characteristics of the company in question (making it a parameter of idiosyncratic risk).

This is an important distinction, since classical financial theory states that only market risks, or systematic risks, are likely to be compensated with higher returns. Idiosyncratic risks, or specific risks, are not compensated with higher returns since they can be eliminated through diversification.

We shall start by presenting the notion of illiquidity risk, as described in the literature. Then we shall look at the links between illiquidity and market values, followed by the links between illiquidity and book values. Finally, we shall present the findings of an exploratory survey conducted during the second half of 2018.

[1] The definition is not the same as for other uses of the term.

1 The notion of illiquidity

1.1 The principle of illiquidity

In financial theory, the value of an asset is equal to the present value of the cash flows that the asset is expected to generate in the future, including cash from its resale, where appropriate. The cash flows calculated in this way are associated with full ownership of the asset. If the cash from the sale of the asset is temporarily unavailable to the owner, the value of the asset will be negatively affected. In this case, the owner of the asset is unable to optimise his or her portfolio allocation by choosing to sell the asset and invest in assets offering higher rates of return or lower risks.

In other words, illiquidity refers to the level of constraints likely to impede the conversion of a given asset into cash. The illiquidity constraint may need to be taken into account, even if the period of illiquidity is short (Longstaff, 1995). In the same way, Barneto and Gregorio (2010) define illiquidity "as the ease with which an investor can trade a given asset at any time immediately and at a low cost".

Therefore, the notion of illiquidity applies to an asset with constraints on its liquidity, compared to another asset that has all the same characteristics, but is easy to sell. Illiquidity is reflected in a "Discount for Lack of Marketability" (DLOM) (Zanni, 2013). Nevertheless, the notions of liquidity and marketability are very similar, but they are not the same. An asset may be traded on a market, but that market may be inefficient, resulting in illiquidity costs.

Illiquidity may affect shares that are not traded freely on a market (Koeplin *and al.* (2000), IPEV Guide (2018)) or, more generally speaking, any assets that cannot be sold freely, such as real assets (Bajaj *and al.* 2001). In principle, the notion of illiquidity is simple, but there are still many questions. In particular, illiquidity may result from idiosyncratic parameters or from market-related parameters.

1.2 What are the most illiquid assets?

The most common assets can be classified according to their illiquidity. Damodaran (2006a) proposes the following classification:

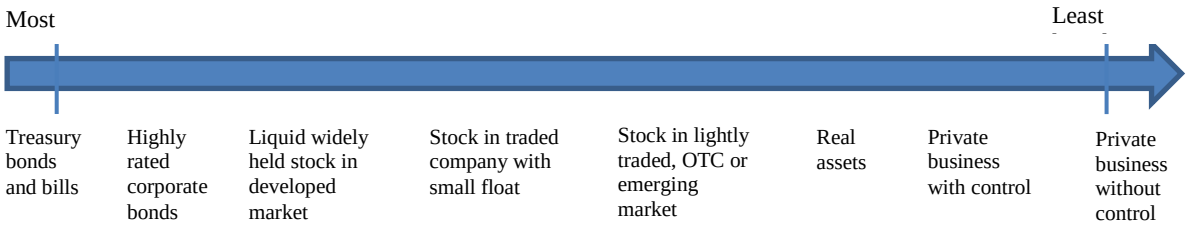

Figure 1: classification of assets by liquidity

A major financial crisis or a short-lived episode of stress could have a significant impact on the proposed ranking. For example, the outcome of the Brexit referendum in June 2016 had a negative impact on the liquidity of British real assets, to the point that the latter were poised to become less liquid than certain unlisted assets (see below).

A major financial crisis or a short-lived episode of stress could have a significant impact on the proposed ranking. For example, the outcome of the Brexit referendum in June 2016 had a negative impact on the liquidity of British real assets, to the point that the latter were poised to become less liquid than certain unlisted assets (see below).

Nevertheless, this classification does show that all assets are not subject to the same liquidity constraints. This explains why a great deal of the literature focuses on the assets most likely to be affected by liquidity constraints, such as unlisted assets, or else assets traded on emerging markets (see Section 2 below).

However, it could be worthwhile (see Section 3 below) to make a distinction between specific illiquidity parameters (idiosyncratic illiquidity risk) and more systematic illiquidity parameters (market risk).

2 Illiquidity and market values

2.1 Idiosyncratic parameters

It is generally acknowledged in the literature that the illiquidity of an asset stems from the characteristics of said asset. With this in mind, the illiquidity risk is basically seen as a specific or idiosyncratic risk, meaning a diversifiable risk, which, consequently, is unlikely to be compensated with higher returns.

The most frequently cited characteristic likely to give rise to illiquidity for a given asset is not being listed on an organised market[2].

Not being listed on an active market is generally seen as a major source of illiquidity. All else being equal, an asset that cannot be sold easily for lack of an active market is less valuable than an asset that an owner can trade freely on a market.

2.1.1 Illiquidity of equities

a) Illiquiity and unlisted companies

The “private company discount” (PCD), or a "discount for lack of marketability" (DLOM), has been described by Hertzel and Smith (1993), Koeplin *and al.* (2000), Bajaj *and al.* (2001), Kooli *and al.* (2003) and, more recently, by Zanni (2013).

Zanni (2013) stressed that the discount stems from the lack of liquidity (or marketability) of private companies compared to comparable publicly traded companies. It should be specified at this point that other elements are likely to explain a discount, such as company size.

[2] A temporary suspension of trading in a given security could also result in temporary illiquidity.

In fact, the discount on "private placements", meaning transactions in private companies, stems from liquidity constraints, along with other factors, such as company size or greater asymmetry of information (transaction costs are higher in the case of private companies).

The difficulty comes with establishing statistical models to distinguish between liquidity effects and the effects of other potential factors determining the private company discount. Researchers generally compare prices for transactions in private companies with prices for transactions in publicly traded companies. They conduct "pricing multiple studies" to compare a panel of comparable companies from the same sectors and of similar size. These studies rely on regression analysis or matched pairs of companies.

The discount found varies between the pricing multiple studies. Koeplin *and al.* (2000) finds a mean discount ranging from 20 % based on the EBITDA multiple to 28 % based on the EBIT multiple for American private companies. Discounts for non-American private companies could range from 40 % to 50 % compared with comparable publicly traded companies in the United States. These findings are in line with those of Kooli *and al.* (2003), who found a discount of 17 % to 34 %, depending on the multiple used (revenue or cash flow), as well as with the findings of Block (2007).

Valuation analysts commonly use these studies to justify the illiquidity discount to be applied for a given company valuation, particularly in the United States. This objective is consistent with the statistical approach using a regression model.

And yet, Novak (2014) underlined the statistical weaknesses of the most commonly cited research, to wit Hertzel and Smith (1993) and Bajaj *and al.* (2001). Therefore, we need to remain prudent about the actual predictive capability of such models. In particular, there is still debate about the models' capability to distinguish the share of the discount that can be attributed solely to illiquidity. In addition, the applicability of the models to other time periods than those in the research has yet to be demonstrated.

b) IPO effect

Another approach to measuring the illiquidity discount examines the price pattern of a security during specific events, such as IPOs. In this case, the price of a transaction in a private company that later goes public is compared to the share price of the same company, once it is public.

This is the approach used by such authors as Emory *and al.* (2002). Emory *and al.* (2002) examined 543 pre-IPO deals between 1980 and 2000 (deals taking place less than 5 months before the company goes public) and found a mean discount of 46 % and a median discount of 47 %.

Their approach is an interesting one, even though it may naturally turn out to be difficult to obtain publicly available information about deals taking place before an IPO, especially since the deals have to be recent ones.

c) Illiquidity and maturity

Other research underlines the fact that illiquidity increases with longer maturities. This is the case for Darolles (2017), Darolles and Roussellet (2017) and Darolles (2018). This is a topical finding, since many investors seeking higher returns are eager to acquire assets for long-term investment. But the longer an asset is held, the less liquid it is and the more sensitive it is to market shocks.

The authors underline the fact that, in the case of open funds combining liquid and illiquid assets, the illiquidity associated with long-term assets skews performance analysis. It raises the question of optimising open fund management.

Trades in long-term assets may be less frequent and volatility information about them is less readily available. Consequently, fund management models need to consider the illiquidity of long-term investment assets. The authors also state that fund managers are starting to think about models that do a better job of capturing liquidity risk.

d) Illiquidity of equity securities depending on the different types of shares issued

Another way to assess the impact of liquidity is to compare the liquidity of different classes of shares issued by the same company (Damodaran, 2006b, p. 518).

A great deal of research has analysed sales of "restricted securities", which are securities subject to specific liquidity constraints. For example, under the terms of SEC Rule 144, restricted securities:

- must be held for a period of one year before being sold;
- are subject to constraints on sales after the one-year holding period, with limits on the numbers of securities to be sold.

For example, Johnson (1999) estimated the likely discount on restricted securities in the United States at approximately 20 % between 1991 and 1995. Johnson's findings are an extension of a major stream of research: he notes that no fewer than 11 studies were conducted in the United States in the 30 years from 1966 to 1995. These studies were the work of both academics and market professionals.

2.1.2 Illiquidity of corporate debt securities

a) Principle of the illiquidity discount for debt securities

Debt securities markets also tend to reveal an illiquidity discount.

As is the case for equity securities, the liquidity of a debt security is the "ability to convert assets into cash immediately or in a very short time" (M&G Investments, 2014).

This aspect is especially critical for debt securities, since such securities, unlike most equities, can feature more or less complex structuring that affects their liquidity. The assumption is that the assets in question are structured to suit the needs of a few categories of qualified investors with the necessary skills.

The complexity of these assets stems from the fact that the issuers do not group them into uniform market categories. Therefore, investors are likely to demand a discount to compensate for this additional constraint.

b) Measuring the illiquidity of debt instruments

According to Chander and Lloyd (2013), illiquidity is generally measured by comparing the price of an illiquid debt security to a perfectly liquid debt security with comparable characteristics, such as a debt security traded on a regulated market.

In this case the difficulty in measuring illiquidity stems from the fact that the structured nature of the instruments described above may make it impossible for the valuation analyst to find comparable publicly traded assets. Furthermore, according to M&G Investments (2014), the

illiquidity of a debt instrument cannot be measured on its own. The discount is actually analysed on a case-by-case basis and generally reflects risk components that are difficult to separate from each other: illiquidity, along with credit risk and complexity.

Measuring the illiquidity discount on its own does not seem to be a key issue for investors, who are more concerned with being appropriately rewarded for all of the risks incurred.

2.2 Market parameters

The other way to consider the question is to think that illiquidity also stems from the state of the market. This changes the nature of illiquidity risk, making it a market risk or a systematic risk. This is a critical distinction, because of its potential implications for compensating illiquidity. According to the classic equilibrium capital asset pricing model (CAPM), developed by Sharpe (1964) and others, only market or systematic risks can be compensated, because they are non-diversifiable. Specific, or idiosyncratic, risk, on the other hand, can be eliminated through diversification of asset holdings.

The notion of systematic illiquidity risk refers to emerging markets or else markets under major, but temporary, stress.

2.2.1 Emerging markets

Researchers are paying more and more attention to illiquidity on emerging markets.

For example, Bekaert and Harvey (2000) and Bekaert *and al.* (2007) have shown how emerging market affect the illiquidity discount.

The authors point out that, all else being equal, illiquidity is greater in an environment with higher systematic, or market, risk, as is the case in emerging markets. In particular, they point out that this illiquidity is accentuated by factors related to the market itself, such as higher political risk and weaker legislation in the country concerned.

2.2.2 Illiquidity and market return

Regardless of the specific characteristics of publicly traded companies, financial market activity may have an impact on liquidity, which means it could affect the value of a given company. However, the findings for this question vary.

Many authors, continuing in the vein of Amihud and Mendelson (1986), have shown that less liquid assets offer higher returns (Pastor and Stambaugh, 2003; Ibbotson *and al.*, 2013; Brennan *and al.*, 2013 or Amihud *and al.*, 2015).

Similarly, Ilmanen (2011), based on a study focusing on the United States between 1990 and 2009, found that the illiquidity discount provided by the seller of an asset compensates and rewards the buyer's illiquidity risk. Therefore, a preliminary link between liquidity and systematic factors (market factors) was proposed.

In more recent research, Borcherding and Stein (2016) looked at publicly traded securities in the United States between 1990 and 2015. They found that the most liquid securities produced returns to risk that were significantly higher than comparable less liquid securities. Ang (2014), on the other hand, tried to quantify the illiquidity discount that the author maintained must be

provided to reward illiquidity risk. He concluded that the illiquidity discount ranged between 0.7 % and 6 %, depending on the illiquidity of the asset in question.

Meanwhile, Chordia *and al.* (2001) show that liquidity is strongly correlated to market return cycles. They highlight the fact that, when market returns are high, liquidity is strong, and vice versa.

2.2.3 Illiquidity during times of temporary market stress

Furthering the previous research, we can point out that major but temporary stress on financial markets can also give rise to an illiquidity discount on a broad swath of assets, as a result of massive flights to liquidity or deleveraging (Khandani and Lo, 2007).

Brunnermeier and Pedersen (2009) have shown that in times of market stress, illiquidity and the market price for liquidity increase, which is perfectly consistent with market micro structure theory (O'Hara, 1995).

Khandani and Lo (2011) show that a distinction needs to be drawn between two types of illiquidity:

- illiquidity affecting certain assets that are less liquid than others and, consequently, need to provide higher returns;
- illiquidity affecting assets in general when a market is less active, as in the event of a market shock. The authors point out that this component should be assessed in the same way as a systematic risk premium.

Even more recently, Ang *and al.* (2014) looked at how liquidity could be influenced by considering systematic risk. In particular, they showed how a temporary crisis limited the arbitraging opportunities available to investors. The authors considered a liquidity crisis that occurs suddenly, without giving investors time to change their portfolios. The temporary crisis means that investors are stuck with assets that used to be liquid, but no longer are. In this context, the illiquidity discount can affect a broad swath of assets. Once again, we see that illiquidity risk encompasses much more than just specific risk.

In this vein, the impact of illiquidity was highlighted in the value of property funds in the United Kingdom after the Brexit referendum in 2016. Seven British financial groups decided to suspend redemption requests from investors in certain property funds. The investors had the option of selling their shares, but only if they were willing to accept a discount of approximately 25 %.

Moss and Lux (2014) examined publicly traded European property companies between 2002 and 2012. Their findings show that, all else being equal, the most liquid companies trade at a premium and that the premium has increased substantially since the 2008 crisis. They measured the premium by comparing the net asset value (NAV) [3] of the companies in question to their market capitalisation. In other research on the property market, Hill *and al.* (2012) identified a positive relationship between the value of a property company and its liquidity, measured by its cash holdings in this case.

[3] The standard indicator used in the property sector.

Thus, in line with Green (2015), these different research findings and market observations underpin the idea that liquidity risk must be seen as a market risk (or systematic risk), and not just as an idiosyncratic risk that is specific to a given security.

2.3 Market pricing of illiquidity

Markets can price illiquidity in various ways.

Damodaran (2006b) sums up the main approaches that can be used:

- Illiquidity can first of all be priced by applying a discount to the value of a liquid asset; this is the simplest approach to implement, even though the question of the percentage to be applied remains: the proposed percentages vary greatly from one author to the next (from 17 % to 50 %, see below), making it difficult to use this approach;
- Illiquidity can also be identified by adjusting the discount rate. The first approach applies a premium to the discount rate to reflect the risk stemming from the illiquidity of an asset. Once again, this approach runs up against the difficulty of determining the appropriate percentage to use when calculating the premium to be applied to the discount rate. This is the case for calculating the spreads applied to debt instruments (Green, 2015). Another method, proposed by Pastor and Stambaugh (2003), adds a "liquidity beta" parameter when calculating the cost of equity capital. This beta is used to measure the sensitivity of a financial asset to a change in market liquidity. According to the authors, the liquidity beta is equal to 1 for an asset where value is strongly correlated to market liquidity and it is equal to 0 for an asset where value is not correlated to market liquidity. The value of this approach is that it can be used to implement portfolio management strategies that diversify assets according to their liquidity betas and not just their return beta.

Increasing the discount rate is consistent with the findings of Saad and Samet (2017) for the period from 1985 to 2012 in 52 countries. They show that the implied cost of equity capital for publicly traded companies increases with illiquidity and even more so during a period of market stress.

More recently, option models were developed to estimate the discount associated with a lack of liquidity. They are based on the idea that holding a liquid security is like holding a put option, which allows the holder to sell a security at a price specified in advance and on a given future date (Abbott, 2009; Finnerty, 2012). In this case the price of the option is considered the price of liquidity. But, using these models is complicated since they entail estimating the volatility of the underlying asset, which is often difficult in the case of an unlisted asset.

3 Illiquidity and book value

Markets consider illiquidity of assets, even though there is still debate about how (see above), but the question of how illiquidity affects book value remains unanswered. Book value is different from market value in many ways and warrants more specific treatment of illiquidity risk.

3.1 Illiquidity and IFRS

The notion of illiquidity risk is addressed in IAS 36. IAS 36.30 stipulates that:

"The following elements shall be reflected in the calculation of an asset's value in use:

(a) an estimate of the future cash flows the entity expects to derive from the asset;
(b) expectations about possible variations in the amount or timing of those future cash flows
(c) the time value of money, represented by the current market risk-free rate of interest;
(d) the price for bearing the uncertainty inherent in the asset; and
(e) other factors, such as illiquidity, that market participants would reflect in pricing the future cash flow the entity expects to derive from the asset. [4]"

This provision of IAS 36 refers to the commonly understood idea that an asset that can easily and rapidly be traded is more valuable than the same asset that is less liquid. We should point out that the accounting standard-setters showed strong prescience, since the standard was published in March 2004, years before the 2008 crisis.

3.2 Illiquidity and book values

The benefits of easily obtainable liquidity measurements became apparent in the 2008 crisis. Obviously, these measurements vary, depending on the nature of the assets in question. They may be price ranges for publicly traded assets, or annual trading volume, etc. (Anson, 2010).

3.2.1 Book values and asset types

The question of whether book values should reflect illiquidity effects comes up in times of financial crisis.

This question is discussed in the report to the French government by Marteau and Morand (2009).

The authors suggest making a distinction between trading assets and medium- and long-term assets: illiquidity effects should be recognised when determining the book value of trading assets, but not for the others.

The authors state that "The book-value amplification of the financial crisis stems precisely from recognition of the liquidity discount when valuing assets and liabilities that are not held for trading."

The authors go on to say that "recognition of liquidity effects on the value of positions that are not held for trading comes from an error in economic[5] analysis." Fair value analysis relies on an accounting model that focuses on measuring the entity's performance.

On this basis, Marteau and Morand (2009) maintain that the question of illiquidity[6] must be broken down into two distinct elements:

- a liquidity discount that affects assets held for trading in general. This discount compensates for the "risk of not being able to sell the asset at its market price under normal market conditions" (p. 11). Even under normal market liquidity conditions, an investor might "not be able to sell the desired quantity at the indicated market price" since the sale of an excessive quantity could lead to a substantial drop in the market price for the asset in question. However, this discount does not affect assets that are held for the longer term;

[4] Our emphasis
[5] Our emphasis
[6] According to the authors, these two illiquidity components come on top of the default discount that compensates the "non-repayment risk" (p. 11). This risk affects all assets to different degrees.

- a specific discount to compensate for the markets' "reluctance" towards certain asset categories (p. 11); this discount, which comes on top of the previous discount, affects only certain asset categories seen as particularly sensitive to episodes of liquidity stress; once again, strategic assets, meaning assets that are held for the long run, should not be affected by this discount (p. 51).

As we shall see later (see Section 4.1), the authors go on to say that, unfortunately, the "systematic" risk component is not yet recognised in book values.

We could also add that this question about aspects linked specifically to long-term holding of equity assets is also a matter of concern for standard-setting at the European level. In June 2018, the European Commission asked EFRAG (EFRAG, 2018) to propose alternatives to measuring equities at fair value through profit or loss or at fair value through other comprehensive income, as required by IFRS 9, for financial years starting on or after 1 January 2019 (with the exception of insurers).

3.2.2 Fair value and illiquidity

Marteau and Morand add that the fair value model imposed by international accounting standards is not satisfactory in a time of financial crisis.

They assert that the assimilation between fair value and market price is "based on an assumption about the information efficiency of financial markets developed by the Chicago School at the end of the nineteen-sixties (Eugene Fama). This principle is obviously applicable for trading assets (e.g. the trading book), but it is no longer applicable when market liquidity is weak[7]. Under such circumstances, fair value is the value of a stock based on prices derived from an insignificant volume of trades, which is not only wrong with regard to theory, but also no longer corresponds to the assumptions underlying the efficiency model" (p. 11).

4 Is systematic illiquidity risk underestimated?

4.1 Systematic risk

It is generally acknowledged in the literature that the illiquidity of an asset stems primarily from the characteristics of said asset (unlisted shares, securities subject to legal or tax restrictions). Therefore, market participants, market analysts, valuation analysts and others seem to misjudge or underestimate the valuation risks related to systematic illiquidity in the event of a financial crisis. And yet, there are many arguments to be made for the systematic nature of illiquidity risk.

First of all, in 2008, only certain assets saw a total collapse of their liquidity (e.g. some securitised assets and, more specifically, subprime assets) or a substantial decrease in their liquidity (e.g. debt securities issued by poorly rated companies). Nevertheless, the impact of this liquidity crisis spread to all other asset classes by contagion. In the event, liquidity risk could be seen as having become difficult to diversify, making it more of a systematic risk than an idiosyncratic risk.

Some authors highlighted this aspect of illiquidity as a market risk (Khandani and Lo, 2007; Khandani and Lo, 2011; Ang *and al.*, 2014; Green, 2015).

[7] Our emphasis

Marteau and Morand (2009, p. 19) clearly point out that, "the discount is made up of three distinct elements: a "default" discount, compensating the risk of non-repayment, a "systematic" illiquidity discount compensating the risk of being unable to sell the position held at the market price under normal market conditions, and a "specific" discount compensating the risk of market "reluctance" towards certain asset categories. As of now, "systematic" illiquidity risk is not considered in book value[8], even though an illiquidity risk haircut would probably have tempered investors' enthusiasm for some securitisation tranches, which were one of main sources of the crisis.

Warnings issued by the Bank for International Settlements (BIS) back in 2015 highlighted the dangers of illiquidity in the event of a financial crisis. In particular, the BIS [9] stressed that a rise in interest rates or an increase in corporate defaults could affect the liquidity of high-yield bonds, which are also called "speculative bonds", leaving many investors "stuck" with their assets. The impact of the current non-conventional or accommodative monetary policies has also be cited. The European Central Bank (ECB, 2019) itself expressed its reservations in August 2019, noting that, "On the one hand we see a prospering asset management industry and growing financial markets. But on the other hand banks have been reducing the size of their trading books, partly as a result of stricter regulation. This shift in market forces is not a major issue when times are good and markets are quiet. But market liquidity can be a bottleneck in times of stress, when many investors are scrambling to square their positions at the same time. In the past, banks had the balance sheet capacity to absorb a good deal of the assets on offer. In terms of market functioning, there are strong indications that this kind of buffering mechanism cannot be relied upon anymore, at least not to the same extent. Market liquidity may evaporate when it is needed most."

In addition to debt assets, equities could also be significantly affected by temporary market stress caused by an excessively rapid rise in interest rates, as was the case in 2008.

Similarly, real assets such as property are affected. As was mentioned above, the prospect of Brexit led to a decision by seven British financial groups to suspend redemption requests from investors in certain property funds in 2016. The investors were offered the option of selling their shares, but only if they were willing to accept a discount of approximately 25 %.

Systematic illiquidity risk is likely to be underestimated and even misunderstood today, even though it is one of the major challenges facing issuers and valuation analysts in the coming years.

Under the circumstances, we sought to understand to what extent finance professionals concerned with valuation (financial analysts, auditors, valuation analysts, etc.) are:

- aware of the notion of systematic illiquidity risk in the event of a major economic or financial crisis;
- adroit with measuring this risk.

To conduct this research, we surveyed a population concerned by this issue. We focused on equity assets in our survey.

[8] Our emphasis
[9] See the quarterly report published in March 2015.

4.2 Presentation of the survey

The survey took place in the second half of 2018 and 454 financial professionals, academics and students were questioned. All of the respondents are based in France.

The questionnaire (see appendix) was administered online using the Google Forms platform. The 454 questionnaires sent out, and followed up by 2 reminders, received 153 responses, for a response rate of 33.7 %. This is a satisfactory response rate in view of the specific nature of the questions.

The respondents' profiles are presented in Table 1, Panels A, B and C. Most of the respondents are between the ages of 30 and 40 (35.3 %), with a post-graduate degree (70 %), working as valuation analysts or external auditors (60 %).

4.3 Main findings

The main findings tend to show that the financial professionals involved in valuation are both:

- unaware of the notion of systematic illiquidity risk;
- and unfamiliar with measuring this risk.

4.3.1 Illiquidity and standards

First of all, as regards standards (question 2.1), we found (Table 2, Panel A) that most respondents (more than 56 %) did not know that IAS 36 deals specifically with illiquidity, even though this standard guides much of the work done in valuation analysis.

And yet, as stated above, the international accounting standard-setter stipulated that, "The following elements shall be reflected in the calculation of an asset's value in use:

(…)(e) other factors, such as illiquidity..."

This means that any valuation that does not consider the effects of illiquidity is not in compliance with IAS 36.

4.3.2 Context and nature of illiquidity

We also asked the professionals about the contexts where illiquidity risk is more critical and about the nature of this risk (Question 2.2). The survey shows (Table 2, Panel B) that illiquidity risk is properly identified when valuing unlisted securities (in more than 61 % of the cases), even though it may not always be measured properly. We also found (Question 4.2) that in most cases (more than 62 %), respondents thought that the illiquidity discount was not properly separated from the size discount, whatever the context (financial statements, M&A or portfolio management). This means there seems to be some confusion in practice about a matter that is critical, particularly in the case of small and medium-sized companies.

It should be noted that the illiquidity discount on unlisted securities is consistent with the view that illiquidity risk is a specific risk, but it cannot account for market liquidity risk in the event of financial stress.

We also found (Question 2.4) that a broad majority of the respondents (nearly 56 %) think that illiquidity:

- is both a specific and a systematic risk,
- and not either a specific or a systematic risk.

This means that most respondents seem to misjudge or underestimate the valuation risks associated with systematic illiquidity in the event of a financial crisis.

Determining whether illiquidity is a systematic or a specific risk is critical for valuation. If illiquidity is a specific risk it can be eliminated through diversification and will not be compensated other than by a specific premium or discount for each asset concerned. And yet, economic or financial crisis and stress are always part of financial and market systems and models.

The vast majority (more than 80 %) of respondents (Question 3.2) agree with the idea that illiquidity affects only trading assets and not assets held for the long term, which is consistent with the position put forward by Marteau and Morand (2009).

4.3.3 Measuring specific illiquidity

Despite the uncertainty about the very notion of illiquidity, we attempted to learn about measurement practices regarding specific illiquidity (Table 2, Panel C).

Among respondents who think that the most satisfactory approach is to increase the discount rate (Question 2.8), the majority (42.5 %) say that the increase should be between 2 % and 5 % for equities and in the absence of economic or financial stress.

Of the other respondents who think, on the contrary, that the most satisfactory approach to illiquidity is to apply a discount to the valuation obtained, the majority (58 %) say that the discount should be between 15 % and 40 %. However, the varying sizes of the discounts suggested by the literature are such that no conclusive pronouncements can be made in this matter.

Despite everything, the majority of the respondents (62 %) think (Question 3.3) that illiquidity discounts for publicly traded companies are immaterial and even impossible to implement. They gave several explanations for this:

- either they think that only certain assets are at risk of total illiquidity (e.g. some securitised assets, particularly, subprime assets) or very significant illiquidity (e.g. debt securities issued by poorly rated companies), and that other assets are liquid. And yet, we have seen (see Section 4.1 above) that the risk of contagion across all asset classes is very real, as was the case in 2008;
- or else they think that occurrences of the risk are too unlikely to be predicted or even modelled (distribution tails).

Here again, we seem to see the view of illiquidity as a specific risk is predominant to the detriment of the systematic view. Valuations do not account for extreme risks correctly.

4.3.4 Summary

In summary, we also attempted to find out whether respondents thought illiquidity was correctly taken into account in valuation analysis.

Not surprisingly, the majority of respondents thought that valuation analysts do not correctly perceive or account for the notion of risk associated with the potential illiquidity of assets and

liabilities (see Table 3, Panel A), either in the context of M&A or when preparing financial statements (Question 4.1). The question still has not been resolved.

Similarly, more than 78 % of the respondents think (Question 4.3) that valuation experts do not properly take account of market illiquidity risk and that the lessons of the 2008 crisis have not been learned (see Table 3, Panel A). This is a key point since the 2008 crisis served as a major reminder to valuation analysts about the importance of the notion of illiquidity (Marteau and Morand, 2009).

Similarly, the majority of the respondents (more than 71 %) think (Question 4.4) that valuation analysts only consider the most reasonably possible events (CAPM) without including extremely rare events as well (Table 3, Panel B). Therefore, the criticism levelled at valuation methods in 2008 is still valid today.

In summary, valuation analysts probably identify the illiquidity of unlisted securities, even though they may not really take it into account, but they undoubtedly seriously misjudge illiquidity arising from exceptional market events in times of severe financial stress. Neither their minds nor their models seem to address extreme crisis scenarios (distribution tails), such as the 2008 crisis. In such situations only certain assets are affected by total or substantial illiquidity, but they drag all other asset classes down with them. In these events, the contagion effect alters the nature of illiquidity risk: it is no longer a specific risk; it becomes a systematic risk.

Perhaps the lessons of the last major crisis have not all been learned, unless we consider that the position of Marteau and Morand (2009) has been implicitly taken on board by all market participants. This position states that illiquidity is not to be taken into account if assets are held for the long term.

5 Tables

Table 1 - Respondents' profiles

Panel A

Respondents' ages	Number	Percent	Running total
20 to 30 years	25	16.3 %	16.3 %
30 to 40 years	54	35.3 %	51.6 %
40 to 50 years	49	32.0 %	83.6 %
more than 50 years	25	16.3 %	100.0 %
Total	**153**	**100.0 %**	-

Panel B

Respondents' educational attainment	Number	Percent	Running total
Some university or less	5	3.3 %	3.3 %
Undergraduate degree	18	11.8 %	15.0 %
Master's degree	107	69.9 %	85.0 %
Doctorate or more	6	3.9 %	88.9 %
Specific degree	17	11.1 %	100.0 %
Total	**153**	**100.0 %**	

Panel C

Respondents' positions	Number	Percent	Running total
Sell side financial analyst	7	4.6 %	4.6 %
Buy side financial analyst	8	5.2 %	9.8 %
Portfolio manager	3	2.0 %	11.8 %
Credit analyst	10	6.5 %	18.3 %
Financial manager	5	3.3 %	21.6 %
External auditor	32	20.9 %	42.5 %
Certified accountant	9	5.9 %	48.4 %
Valuation analyst (consulting firm, investment bank, M&A, etc.)	59	38.6 %	86.9 %
Teacher	8	5.2 %	92.2 %
Other	12	7.8 %	100.0 %
Total	**153**	**100.0 %**	

Table 2 - Main findings

Panel A: Illiquidity and standards

Do you think that consideration of illiquidity risk is explicitly stipulated by:	Number	Percent
French standards	56	45.5 %
IFRS	67	54.5 %
Total	**123**	**100.0%**

Panel B: Context and nature of illiquidity

What do you think is the most important contributing factor to illiquidity of assets?	Number	Percent	Running total
For valuation of private companies	94	61.4 %	61.4 %
For restrictions on selling (e.g. tax constraints)	23	15.0 %	76.5 %
For recognising a situation in which trading volume is/or could be reduced (for listed assets)	12	7.8 %	84.3 %
Other situations	3	2.0 %	86.3 %
Illiquidity is not considered	21	13.7 %	100.0 %
Total	**153**	**100.0%**	-

What type of risk do you think illiquidity risk is?	Number	Percent	Running total
Illiquidity risk must above all be seen as a specific risk (inherent to the asset) => not compensated	25	16.3 %	16.3 %
Illiquidity risk must be seen as a systematic risk (market risk) => risk that may be compensated	34	22.2 %	38.6 %
Illiquidity risk must be seen as both specific and systematic risk => risk that may be compensated, in part at least.	85	55.6 %	94.1 %
No opinion	9	5.9 %	100.0 %
Other	0	0.0 %	100.0 %
Total	**153**	**100.0%**	-

Valuation analysts properly distinguish the illiquidity discount from the size discount	Yes *	Percent	No **	Percent	Total
When preparing financial statements	56	36.6 %	97	63.4 %	**153**
For M&A	58	37.9 %	95	62.1 %	**153**
For portfolio management	52	34.0 %	101	66.0 %	**153**

* Very much agree and somewhat agree
** Very much disagree and somewhat disagree

More generally:	Yes *	Percent	No **	Percent	Total
Illiquidity risk should be considered only in the case of assets and liabilities held for trading, and not for assets and liabilities held for the medium to long term (not for trading)	123	80.4 %	30	19.6 %	**153**
Illiquidity risk should be considered only in the case of assets and not liabilities	134	87.6 %	19	12.4 %	**153**

Panel C: Measuring illiquidity

If you think the most satisfactory approach is to increase the discount rate, what is or should be the approximate increase, absent economic or financial stress	1 % to 2 %		2 % to 5 %		5 % to 10 %		More than 10 %		Total
For equity assets	32	20.9 %	65	42.5 %	39	25.5 %	17	11.1 %	**153**
For debt assets	33	21.6 %	60	39.2 %	36	23.5 %	24	15.7 %	**153**

Some authors and professionals recommend a discount of between 15 % and 40 % for a period between 1 and 5 years.	Yes *	Percent	No **	Percent	Total
Do you agree with this estimate of the illiquidity discount?	89	58.2 %	64	41.8 %	**153**

* Very much agree and somewhat agree
** Very much disagree and somewhat disagree

	Yes *	Percent	No **	Percent	Total
Illiquidity discounts for publicly traded companies are immaterial and even impossible to implement: occurrences of the risk are too sudden to be predicted or even modelled (improbable distribution tails).	95	62.1 %	58	37.9 %	**153**

* Very much agree and somewhat agree
** Very much disagree and somewhat disagree

Table 3 - Summary

Panel A

	Yes *	Percent	No **	Percent	Total
Valuation analysts give illiquidity risk for listed assets due consideration The lessons of the 2007/2008 crisis have been learned	33	21.6 %	120	78.4 %	**153**

* Very much agree and somewhat agree
**Very much disagree and somewhat disagree

Panel B

	Yes *	Percent	No **	Percent	Total
With regard to the notion of systematic risk, it seems that valuation analysts consider only the most reasonably possible events (using CAPM), without including the most extremely rare events (distribution tails)	44	28.8 %	109	71.2 %	**153**

* Very much agree and somewhat agree
** Very much disagree and somewhat disagree

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Survey

1 Context

1.1 Are you?

a. Male
b. Female

1.2 What is your age?

a. Between 20 and 40-year-old
b. Between 40 and 50-year-old
c. 50-year-old and older

1.3 Last diploma obtained?

a. Bachelor's degree or less
b. 4 years of College
c. Master's degree
d. 6 years of College
e. Specific degree (CPA, CFA, SFAF,…)

1.4 What is your field of activity?

a. Financial analyst *sell side*
b. Financial analyst *buy side*
c. Porfolio manager
d. Credit analyst
e. Work in a Financial Division
f. Auditor
g. CPA
h. Financial analyst witihin either a consulting firm or an investment bank
i. Professor

2 Valuation and illiquidity discounts (analysis/measurement /evaluation)

2.1 According to you, is the illiquidity discount explicitly mentioned by?

a. French accounting standards
b. International financial reporting standards

2.2 According to you, is illiquidity taken into account in the following contexts?

a. Valuation of unlisted companies
b. Selling restrictions (for tax purposes for example)
c. Limited number of market transactions (for listed securities)
d. Other contexts
e. Illiquidity is never taken into account.

2.3 According to you, what is the main reason why assets may be illiquid?

a. The worse the rating of an asset (equity or debt), the more illiquidity risk it incurs.
b. The shorter the term of a debt asset, the more illiquidity risk it incurs.
c. The unlisted assets (equity or debt) are more prone to being illiquid
d. Other reason
e. No answer

2.4 According to you, how would you define illiquidity risk?

a. Illiquidity risk is specific to the asset (idiosyncratic). Therefore, it does not require any excess return.
b. Illiquidity risk is a systematic risk (market risk). Therefore, it does require an excess return.
c. Illiquidity risk is both specific to the asset and systematic. Therefore, it does require an excess return, at least in part.
d. No answer

2.5 The illiquidity discount is contingent upon the ability to devise an efficient hedging strategy. Should an efficient hedging strategy be possible, the discount would be nil.

e. I do not agree
f. I partly agree
g. I mostly agree
h. I totally agree

2.6 The most relevant approach to measuring illiquidity risk is to:

a. Increase the discount rate by adding a premium specific to the illiquidity risk.
b. Increase the discount rate by factoring in an illiquidity beta.
c. The amount should be fixed on a flat-rate basis and applied to the value of the firm or of its equity.

2.7 How often should this measure of the risk be reassessed?

a. More than every six months
b. Each semester
c. Annually
d. Less often than annually
e. No need to reassess the risk.

2.8 Should the most relevant approach be to add an illiquidity premium to the discount rate, what would be the premium required (approximately and under normal market conditions)?

a. For equity instruments
    i. Between 1 % and 2 %
    ii. Between 2 % and 5 %
    iii. Between 5 % and 10 %
    iv. More than 10 %

b. For debt instruments
    i. Between 1 % and 2 %
    ii. Between 2 % and 5 %
    iii. Between 5 % and 10 %
    iv. More than 10 %

2.9 The flat-rate discount has been estimated, by some authors, to be between 15 % and 40 %, for a maturity ranging between 1 and 5 years.What is your take on this discount level?

a. I do not agree
b. I partly agree
c. I mostly agree
d. I totally agree

3 To what extent is illiquidity risk taken into account?

3.1 Illiquidity risk is both complex and difficult to assess, and therefore should not always be taken into account.

a. It is nigh impossible to distinguish between a discount for illiquidity or for other risks.
b. Data or assets returns are biased.
c. Illiquidity risk is difficult to assess.
d. Taking into account an illiquidity risk for liabilities is counter-intuitive. It would imply an increase in the discount rate and thus a decrease in the liability balance.
e. Illiquidity is not constant
f. I do not agree with this sentence

3.2 More generally:

a. Illiquidity risk should be taken into account only for trading assets/liabilities, and not for assets or liabilities held to maturity (or for a long period of time).
    i. I do not agree
    ii. I partly agree
    iii. I mostly agree
    iv. I totally agree
b. Illiquidity risk should be taken into account only for assets (as opposed to liabilities).
    i. I do not agree
    ii. I partly agree
    iii. I mostly agree
    iv. I totally agree

3.3 As far as listed companies are concerned, illiquidity risk is not relevant because impossible to implement. Illiquidity risk is both is too violent and random to be statistically significant (fat tails).

a. I do not agree
b. I partly agree
c. I mostly agree
d. I totally agree

4 Conclusion: how is illiquidity risk and discount taken into account by various stakeholders?

4.1 Illiquidity risk is correctly assessed by financial analysts:

a. Regarding the financial statements published.
   i. I do not agree
   ii. I partly agree
   iii. I mostly agree
   iv. I totally agree
b. During a merger or acquisition
   i. I do not agree
   ii. I partly agree
   iii. I mostly agree
   iv. I totally agree
c. Regarding portfolio management.
   i. I do not agree
   ii. I partly agree
   iii. I mostly agree
   iv. I totally agree

4.2 Illiquidity and size discounts are correctly and separately assessed by financial analysts.

a. Regarding the financial statements published.
   i. I do not agree
   ii. I partly agree
   iii. I mostly agree
   iv. I totally agree
b. During a merger or acquisition
   i. I do not agree
   ii. I partly agree
   iii. I mostly agree
   iv. I totally agree
c. Regarding portfolio management.
   i. I do not agree
   ii. I partly agree
   iii. I mostly agree
   iv. I totally agree

4.3 Financial analysts properly take into account illiquidity risk for listed assets. The consequences of the 2008 crisis have been properly integrated.

a. Equity instruments
   i. I do not agree
   ii. I partly agree
   iii. I mostly agree
   iv. I totally agree
b. Debt instruments
   i. I do not agree
   ii. I partly agree
   iii. I mostly agree

4.4 As far as systematic risk is concerned, only the most probable occurrence seem to be taken into account in the CAPM model, leaving out the least probable ones (fat tails)

a. Equity instruments
    i. I do not agree
    ii. I partly agree
    iii. I mostly agree
    iv. I totally agree
b. Debt instruments
    i. I do not agree
    ii. I partly agree
    iii. I mostly agree
    iv. I totally agree