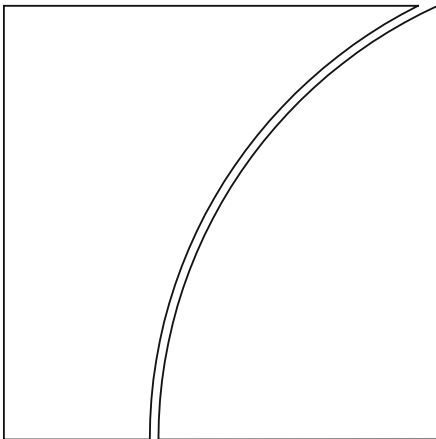


# Basel Committee on Banking Supervision



## Guidance for Supervisors on Market-Based Indicators of Liquidity

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# Guidance for Supervisors on Market-Based Indicators of Liquidity

## Executive summary

This document is intended to assist supervisors when they evaluate the liquidity profile of assets held by banks. While each jurisdiction will make its own determination as to HQLA qualifications and their application to supervised institutions, some commonality in the tools and data used to make such determinations will help ensure a level of consistency across jurisdictions. Supervisors are expected to work within the existing framework of “levels” established by the LCR standard, using the associated haircuts and diversification requirements associated with each level. As described in the LCR standard, national authorities can choose whether to include an additional class of Level 2B assets. This gives scope for the potential inclusion in HQLA of a wide range of assets with very different liquidity profiles. This document provides suggestions that may assist supervisors when classifying such assets.

## Introduction

### Purpose, scope, structure

The Basel Committee established the Liquidity Coverage Ratio (LCR)<sup>1</sup> to promote the short-term resilience of banks’ liquidity risk profile. The LCR is designed to ensure that banks have an adequate stock of unencumbered high quality liquid assets (HQLA) that can be converted into cash easily and quickly in private markets to meet a bank’s liquidity needs over a 30-calendar day liquidity stress scenario.

$$\frac{\text{HQLA}}{\text{Total net cash outflows over the next 30 calendar days}} \geq 100\%$$

Given the prominence of HQLA in the LCR formula (above) and the broad array of asset classes that can potentially comprise HQLA, a robust framework and tools for evaluating these asset classes are essential to a sound and meaningful LCR calculation.

The liquidity value of an asset depends on the underlying stress scenario, the volume to be monetised and the timeframe considered. Nevertheless, there are certain assets that are more likely to generate funds without incurring large discounts in sale or repurchase agreement markets due to fire sales, even in times of stress. Certain key attributes and market analytics can be observed over time and under various scenarios to help determine a specific asset’s position on a liquidity continuum.

For this reason, the Committee has published these guidelines. This guidance does not supplant, but expands upon the more general HQLA qualification guidelines established by the LCR. It outlines the factors that influence the extent to which the market for an asset can be relied upon to raise liquidity when considered in the context of possible stresses. The analytical tools/methodologies identified here are to assist supervisors in determining how particular assets should be included in which

<sup>1</sup> *Basel III: The Liquidity Coverage Ratio and Liquidity Risk Monitoring Tools* is available at [www.bis.org/publ/bcbs238.htm](http://www.bis.org/publ/bcbs238.htm).

specific categories of HQLA, if at all. It sets forth guidance with which to qualify the effective composition of HQLA at a supervisory level from a market liquidity perspective, with a special focus on performance during periods of financial distress.

The current standard for the LCR relies on a combination of qualitative criteria, Basel risk weights and external credit ratings to determine asset class eligibility for the pool of HQLA. These general criteria were used to categorise broad asset classes into three levels of HQLA: Level 1, 2A, and 2B. However, individual assets within those wide-ranging categories and across different jurisdictions, financial markets and currencies can exhibit very different liquidity characteristics. In addition, the markets for specific assets, and thus the liquidity to be derived from a given set of assets, can vary over time. Indeed, a key lesson from the financial crisis is that deep and liquid markets can dry up very quickly.

Supervisors require tools to help determine an initial placement of assets into the appropriate HQLA category (if any). Subsequently, they need criteria to help determine when inclusion in a particular category is no longer appropriate. While each jurisdiction will make their own determination as to HQLA qualifications and their application to supervised institutions, some commonality in the tools and data used to make such determinations will help ensure a level of consistency across jurisdictions.

The development of one or more frameworks for evaluating quantitative evidence on liquidity could yield a number of additional benefits. First, it would allow for a more objective and robust assessment of asset liquidity. Second, it could assist in a more standardised and transparent application of the HQLA criteria across jurisdictions. Third, it could enhance incentives for policymakers, supervisors and the banks they supervise to improve data collection and analysis, thereby leading to a better understanding of the liquidity characteristics of financial assets in their jurisdictions. The research gains from doing this work are important; a better understanding of liquidity concepts and measurement would promote the success of liquidity regulation and other analysis (such as vulnerability assessment) more generally. Finally, it would move towards reducing reliance on external credit ratings.

Consistency with the Basel framework, which sets forth a minimum standard to which internationally active banks will be held, is paramount. As such, appropriate use of this guidance includes providing tools for supervisors to use in making decisions for (i) excluding an asset class from HQLA altogether, or (ii) moving an asset class down (temporarily or permanently) from its LCR-defined HQLA position. The framework is not to be used to introduce into HQLA an asset that is not currently part of the LCR's classifications, or the placement of an asset into a higher HQLA level/category than that established by the LCR standard.

Further, the guidance in this document is not intended for direct application to the sovereign debt of a bank's home jurisdiction or from the jurisdiction in which a bank operates; central bank reserves; central bank debt securities; and cash. Such assets will defer to the HQLA categories as established in the LCR standard.

## Framework for assessing market liquidity and suggested list of candidate criteria

The description of the framework is divided into three sections. Section 1 discusses components of a framework that supervisors might use to assess the market liquidity characteristics of asset classes or individual assets in their jurisdiction. Section 2 sets out the key characteristics of assets and markets that might provide useful indicators of market liquidity, along with examples of specific liquidity metrics calculated from historical data that could be examined to test whether an asset has been liquid in the past. Section 3 discusses how this range of indicators and data might be combined to provide supervisory guidance.

## 1. Possible uses for an assessment framework

The LCR standard relies on a combination of qualitative criteria, Basel risk weights and external credit ratings to determine asset class eligibility for the HQLA pool. These general guidelines were used to categorise broad asset classes into three levels of HQLA: Level 1, 2A, and 2B. However, individual assets within those broad categories, and across different jurisdictions, financial markets and currencies, can exhibit very different liquidity characteristics. In addition, the markets for specific assets, and thus the liquidity to be derived from a given set of assets, can vary over time.

LCR summary illustration of HQLA levels, associated haircuts and diversification requirements

Table 1

Item	Haircut
Stock of HQLA	
Level 1 assets	0%
Level 2 assets (maximum of 40% of HQLA)	15%
Level 2A assets	25%
Level 2B assets (maximum of 15% of HQLA)	50%

Consistency with the Basel framework, which sets forth a minimum standard to which internationally active banks will be held, is paramount. As such, appropriate use of these guidelines (in support of the application of the LCR definition of HQLA to domestic regulation) include:

1. excluding an asset or asset class from HQLA altogether;
2. moving an asset or asset class down (temporarily or permanently) from its LCR-defined HQLA position;
3. selecting additional assets (from the LCR rule's prescribed list of potentially qualifying assets) to include within a potential Level 2B asset category; and
4. raising the haircut on an individual asset or asset class.

The guidance is not to be used to:

1. introduce into HQLA an asset that is not currently part of the LCR's classifications of acceptable assets;
2. place an asset into a higher HQLA level/category than that established by the LCR standard;
3. lower the haircut on an individual asset or asset class; or
4. unilaterally reclassify the sovereign debt of a bank's home jurisdiction or from the jurisdiction in which a bank operates, central bank reserves, central bank debt securities, or cash.

Supervisors are expected to work within the existing framework of "levels" established by the LCR standard, utilising the associated haircuts and diversification requirements associated with each level. If an asset is deemed less liquid by a local supervisory authority and moved down a level, a higher haircut would apply (thus the asset would count proportionally less towards the HQLA pool) and be subject to the aggregate caps associated with level 2A and 2B assets.

This guidance may also be useful in supporting supervisors' efforts to gather additional information and data on the liquidity of assets and asset classes, including from their supervised banks. As described in the LCR standard, national authorities have been given the choice of whether to include an additional class of Level 2B assets. Among the asset categories that are to be evaluated by individual jurisdictions for potential inclusion are certain types of residential mortgage-backed securities, corporate

debt securities (including commercial paper), and common equity shares. This gives scope for the potential inclusion of a wide range of assets with very different liquidity profiles into HQLA, which in turn drives the market data used to formulate the guidelines.

Before discussing in detail the indicators and data that might be employed in an assessment, it helps to set out upfront the two distinct areas where an assessment framework might be used by supervisors to provide guidance. These are:

1. providing guidance on whether specific *asset classes* within the LCR definition can be considered as HQLA in their jurisdiction; and
2. providing guidance on the characteristics which *individual assets* that qualify under the LCR definition should have if they are to be considered as HQLA.

Clearly the task of providing guidance on an asset class is likely to involve a more general appraisal of the features of typical assets in that class, whereas the task of providing guidance applicable for individual assets needs to be more specific.

Direct measures of liquidity can be particularly useful in determining the relative liquidity of individual assets within an asset class because they can provide consistent quantitative information. In contrast, purely quantitative comparisons of liquidity metrics across asset classes and, particularly across jurisdictions, may be informative of relative liquidity, but are less likely to be definitive. Differences in market structure, asset structure and data availability across asset classes and across jurisdictions complicate direct quantitative comparison. As a result, supervisory judgments on relative liquidity across asset classes should involve a more general appraisal of asset and market characteristics, as described below.

## 2. Characteristics, criteria and metrics that supervisors should consider in judging asset liquidity

As discussed earlier, an asset's market liquidity is influenced both by its own specific features and the characteristics of the broader market structure within which it is traded. Set forth here are some candidate characteristics that can enhance the liquidity of an individual security or asset class.

The characteristics and criteria outlined below are supported by the liquidity attributes published as part of the LCR standard and draw extensively upon other statistical reviews, academic studies, and policy studies from multiple jurisdictions.<sup>2</sup> Given the idiosyncrasies of data availability surrounding individual asset markets, along with the summary nature of the information presented here, supervisors are encouraged to supplement this guidance by referencing these (and other) sources directly in making judgments about the eligibility of HQLA in their jurisdictions.

<sup>2</sup> Sources include the European Banking Authority Discussion Paper, "On defining Liquidity Assets in the LCR under the draft CRR" (2013), [www.eba.europa.eu/documents/10180/42030/DP-on-defining-liquid-assets-in-the-LCR.pdf](http://www.eba.europa.eu/documents/10180/42030/DP-on-defining-liquid-assets-in-the-LCR.pdf); and the Institute of International Finance, "Methodology and Objective Criteria for Defining Additional Eligible Liquid Assets for the LCR", June 2012, [www.iif.com/regulatory/article+1157.php](http://www.iif.com/regulatory/article+1157.php).



Liquidity characteristics, criteria and metrics

Table 2

	Characteristic	Criteria	Examples of metrics/measures
Asset characteristics	Asset quality	Probability of default	Ratings
			Spreads
		Price drops during distress	
	Flight to quality (performance during distress)	Performance relative to risk-free asset	
		Correlation with financial stress	
	Volatility	Implied and actual volatility	
		Duration/time to maturity	
	Transparency and standardisation	Collateral eligibility	Eligible/haircuts at FMIs*
			Across private counterparties
Standardisation		Small number of standardised product types	
		Standardised risk modelling	
		Well understood risk properties	
Price transparency	Pre-trade pricing broadly available		
	Post-trade pricing broadly available		
Market structure characteristics	Trading venues	Electronic (including hybrids)	
		Exchange-traded	
	Size	Volumes (number of trades and dollar value)	
		Outstandings	
	Related financing markets	Repo financing available	
		Other secured/forward financing	
		Related hedging markets	
Market participation	Breadth of investors (low concentration)		
	Large number of active market makers		
Market liquidity	Liquidity	Depth/price impact of trading	Amihud ratio(price changes relative to volume)
			Autocorrelations of returns
	Breadth	Effective bid-ask spreads (ex post)	
		Quoted bid-ask spreads (ex ante)	
	Immediacy	Average number of trades per day	
Number of days with zero return/volume			

\* Financial Market Infrastructures – FMIs could include payment systems, central securities depositories, securities settlement systems, trade repositories and central counterparties.

## A. Asset characteristics

1. **Probability of default:** the credit quality of an asset will influence investors' willingness or ability to hold it. Information and data such as credit ratings, spreads to "risk-free" assets and measurements of asset price declines during periods of market turmoil can all be indicators of asset quality.
2. **Flight to quality:** assets whose prices tend to rise during times of market turmoil typically illustrate higher market liquidity during stress. The correlation between asset price and banking system stress is one simple measure that could be used.

3. **Volatility:** assets with low volatility tend to be less risky and more liquid. Volatility of traded prices and spreads are simple proxy measures of market volatility. There should be historical evidence of relative stability of market terms (eg prices and haircuts) and volumes during stressed periods.
4. **Remaining time to maturity:** time to maturity (or the time to first call date for callable bonds) is likely to affect the price volatility of a security and also affects the range of investor who are able to hold it, although its impact needs to be corrected for seasoning effects which can reduce asset liquidity over time.
5. **Collateral eligibility:** frequently accepted as collateral for transactions in other assets/derivatives at a wide range of markets, clearing houses, and payment systems.
6. **Standardisation of asset features:** where an asset has a standard structure this can facilitate widespread understanding of the risks it poses, increasing investors' confidence in its pricing and hence boosting market liquidity.
7. **Price transparency:** availability of transparent, publicly available pricing sources can enhance willingness to trade and hence market liquidity.

## B. Market structure characteristics

1. **Trading venues:** the ability to transact on an electronic trading platform or listed exchange enhances transparency; the ability to trade the asset on a broader range of trading environments (including dealer-based ones) can generate additional scrutiny and broaden participation, supporting market liquidity.
2. **Market size:** there are several aspects of the market size for an asset class that can have a bearing on the liquidity of that class as a whole, or of individual securities within that class. These include the aggregate outstanding value, the aggregate trading volume, the aggregate numbers of trades observed, and the weight of the asset class in global and local investment portfolios.
3. **Issue size:** the outstanding amount of a security available for trade affects the ability to buy and sell the security in large quantities.
4. **Related financing markets:** availability of repo or securities lending markets for an asset class increases the prospects for it to be liquid.
5. **Market participation:** widespread and diverse participation in the market is a signal of potentially higher asset liquidity.
6. **Market-makers:** asset markets with a large group of (well capitalised) market-makers offering to trade on a continuous basis tend to have higher liquidity.

Data on asset and market structure characteristics should be relatively straightforward for supervisors to gather (particularly in comparison to the historical metrics discussed below). However, some characteristics might not be easily captured by quantitative data, and hence cross-market comparison may not be straightforward (eg market transparency is a qualitative concept). In addition, the linkage between a specific characteristic and asset liquidity is likely to vary across markets and over time. Consequently, it is recommended that supervisors supplement their assessment and measurements of liquidity from asset and market characteristics by direct measurement of liquidity whenever possible.

## C. Liquidity metrics: direct measures of market liquidity

Quantitative metrics capturing important aspects of the market liquidity of a specific security or asset class can help supervisors both to assess the relative liquidity behaviour of different securities, and to develop an understanding of the ranking of liquidity across a range of asset classes.

Many specific metrics of liquidity and quality exist in the academic literature; some key metrics that might be of most relevance to supervisors are summarised in Table 2 and listed below. In some jurisdictions, historical data can be difficult to obtain, particularly for securities traded predominantly in OTC markets (eg many classes of debt securities). Supervisors are likely to find a trade-off exists between the use of simple metrics, which might be straightforward to calculate and potentially more comparable across assets and markets, and more complex metrics, which may have greater predictive power for market liquidity but are only available or applicable in a subset of markets. Therefore, relative simplicity and intensity of data requirements, as well as theoretical justification, were considered in compiling this list.

1. **Depth/price impact of trading:** including Amihud ratio (price changes relative to volume) and autocorrelation of returns
2. **Breadth:** including bid/ask spreads
3. **Immediacy:** including average number of trades per day and number of days with zero returns or volume.

While the academic literature has proposed a wide variety of liquidity proxies to measure asset and market liquidity, no single universally accepted measure exists that can capture all the dimensions of liquidity. Limitations in the readily available data across jurisdictions and markets are the main restriction on calculating these liquidity metrics. At the very least, a simple liquidity metric requires asset price data at the International Securities Identification Number (ISIN) level. For most metrics, transaction volume, outstanding issue, and/or bid-ask quotes are also required. Finally, since the results of these calculations are most meaningful when compared across time rather than across jurisdictions, several years of data are required to observe the change in an asset's liquidity across different market conditions and at different points in the business cycle.

## 3. Using characteristics and metrics to create a framework for supervisory judgment

When providing supervisory guidance, supervisors could use information on the characteristics of an asset or asset class, the structure of the markets it trades in, and historical data on its trading behaviour in a range of ways. This section discusses three possible approaches: a "historical" method largely reliant on historical data to directly measure market liquidity, an alternative "definitional" approach which uses historical data to identify characteristics that can provide usable definitions of liquid assets, and a simpler checklist framework using asset characteristics, which may be useful in cases where supervisors face larger data gaps in measuring asset liquidity.

The approaches proposed below are not exhaustive, but represent a reasonable range of options for supervisors to consider in organising information and data on asset liquidity. Supervisors will need to judge which of the frameworks below, if any, are appropriate for assets and asset classes in their jurisdictions. In some cases, certain frameworks may be appropriate for some assets and asset classes, but not for others. Moreover, in all cases, the frameworks below will require significant supervisory judgment for implementation, including local knowledge about the use and structure of particular assets. In addition, supervisors will need to make judgments about which metrics or characteristics of asset liquidity are likely to be most useful in their local market and to their supervised institutions.

**Historical method:** One possible approach would be to rely directly on past evidence of the historical liquidity of assets as a means of determining their eligibility as HQLA. Here the main challenges would lie in identifying which characteristics and which metrics of liquidity and quality from the table above should be given most weight, bearing in mind the data availability constraints that are encountered in the each jurisdiction. Once a historical dataset has been produced, it might be feasible within a single jurisdiction to identify threshold levels for individual metrics, beyond which an asset would be classified as eligible for the HQLA buffer, for example where bid-offer spreads were below X basis points and daily trading volumes were above \$Y. It is important to note that such an approach would not be applicable in a harmonised manner across jurisdictions, as the appropriate thresholds cannot be set at a consistent absolute level across markets, but rather can only be arrived at through a process of informed judgment within a specific market.

A variant on this historical approach would be to devise a means of combining a number of metrics into a single liquidity score, and then devising a threshold for this combined metric. Calibration of the weights of this score would need to be established for the specific characteristics of the individual jurisdictions, and it may be difficult to achieve consistency across asset classes.

One major drawback of the historical method is that the exercise should be repeated at regular intervals to ensure a consistent treatment over time, and it may also be difficult to apply to newly issued securities.

**Definitional method:** A definitional approach may involve a more complex analysis than the historical method, but it may provide guidance that is more robust over time and may be more applicable across jurisdictions. A definitional approach entails assessing how well a set of relevant asset and market characteristics (such as that in Section 2.B) actually predict market liquidity metrics (such as those in Section 2.C). This approach has the advantage that it could be applied not only to asset classes where historical liquidity metrics are available, but also potentially to deriving definitions of liquidity for assets where such historical liquidity metrics are harder to obtain.

Under this method, supervisors would still be required to choose which metrics they felt best captured the market liquidity of the assets being examined, and they would also need to make judgments about thresholds appropriate for their jurisdictions. However such judgments would be used to assess which characteristics had useful predictive power over whether an individual asset was found to be liquid, with those that were found to be useful predictors becoming components of a definition of a liquid asset.

For example, if it was found that UK corporate bonds with issue sizes below £100 million typically failed to surpass the thresholds chosen, then a necessary part of the definition of a liquid asset would be to have an issue size >£100 million. The definition of liquid asset could be stated either as a set of characteristics that must all be met individually, or as a combined set of characteristics, of which the asset must meet at least X characteristics to be classified as liquid.

**Checklist method:** The term checklist method refers to an approach where supervisors would use their judgment to devise a set of criteria that an asset or asset class would need to meet to be eligible to qualify for a particular component of HQLA. A "strict checklist approach" would require all checks to be met for an asset to qualify, while a "threshold checklist approach" would require that a minimum number of checks be met. This section describes an example of a more sophisticated "tiered checklist approach" which combines elements of the strict and threshold approaches in setting out some fundamental checks that must be met to qualify, and some data-dependent metrics where a set threshold of checks must be met.

As a practical matter, supervisors might choose to use a checklist method for identifying eligible assets or asset classes if a lack of quantitative data on the historical liquidity of the assets being studied prevented them from adopting either the historical or definitional methods. Therefore although the checklist could in principle incorporate quantitative checks where data are available for a limited set of metrics, it is most likely that in practice supervisors would use this method when they lacked more

detailed data and information to calculate direct liquidity metrics and instead they would need to rely more heavily on checks assessing the qualitative characteristics of assets.

Checklist example: Below is an example of a checklist method that could assist supervisors in determining which assets, despite meeting the criteria from paragraphs 49 to 54 of the Basel LCR text, are not sufficiently liquid in private markets to be included in the stock of HQLA. The example checklist uses a sequential approach to determining whether to exclude assets from HQLA (or increase their haircuts). The checklist starts with fundamental measures: simple but critical liquidity criteria, and then progresses to more data-intensive metrics that directly measure different aspects of asset liquidity. Table 3 below uses the liquidity metrics/measures proposed in Section 2 and provides an example of a tiered checklist that supervisors could consider. The example in Table 3 classifies measures/metrics into four classes: fundamental, basic, data-dependent and calculated.

**Fundamental Metrics:** Failure to meet any one of the fundamental metrics would be grounds for disqualification of an asset from an HQLA level. For example, a corporate debt security is BBB-rated, but denominated in a non-convertible currency that would be the sole basis needed by a supervisor to disqualify it. These metrics would require little or no data.

**Basic Metrics:** Failure to meet a combination of these metrics would be grounds for disqualification. For example, if an asset met all the Fundamental Metrics, but failed to meet X out of 15 listed in Table 3, the asset might be disqualified from HQLA. These metrics would require little or no data.

Supervisors have the discretion to determine whether a metric should be Fundamental or Basic for their jurisdictions.

**Data-Dependent Metrics:** These metrics require basic data collection and/or basic calculations. If data are available to calculate them, these metrics would be applied to assets that have passed both the Fundamental and Basic metrics. To apply these metrics, supervisors would set a minimum threshold for each metric that would qualify an asset to be classified as an HQLA. The supervisor could disqualify an asset for failing to meet any one of the minimum thresholds or it could disqualify an asset for failing to meet a certain number of minimum thresholds (for example, if it failed to meet two thirds of all the minimum thresholds). This would be at the supervisor's discretion.

**Calculated Metrics:** These metrics require more complex data collection and calculations. These metrics would be applied to assets that have passed the Fundamental, Basic, and Data-Dependent metrics. These metrics would be applied in a similar manner to the Data-Dependent Metrics. If a broad array of calculated metrics can be calculated for particular asset or asset class, then one of the more sophisticated methodologies – historical or definitional methods might be preferred by supervisors.

Another way to apply the Data-Dependent and Calculated Metrics would be to apply only certain metrics or thresholds within a metric to a particular level of HQLA. For example, qualifying Level 1 HQLA may only be required to pass the Fundamental and Basic Metrics, but qualifying Level 2 assets might need to pass the Fundamental, Basic, and Data-Dependent Metrics. This concept can be further extended by applying only certain metrics to a particular asset class within an HQLA level. For example, if qualifying Level 2 assets are required to pass the Fundamental, Basic, and Data-Dependent Metrics, a supervisor could further require RMBS to demonstrate a low correlation with risky assets, which is a Calculated Metric.

Example of a tiered checklist using MBI of liquidity

Table 3

	Characteristic	Calculated Metrics	Data-Dependent Metrics	Basic Metrics	Fundamental Metrics	
Asset characteristics	Asset quality	Option-adjusted spreads	Ratings		Is it rated by a ratings agency recognised in the jurisdiction?	
		Duration	Time to maturity			
		Correlation with financial stress	Are there large price drops during distress?			
		Implied and actual volatility				
		Performance relative to risk-free asset				
Market structure characteristics	Transparency and standardisation		Haircuts At FMIs	Eligible at FMIs?	Denominated in a convertible currency?	
				Eligible at private counterparties?		
				Small number of standardised product types?		
				Well understood risk properties		
				Pre-trade pricing broadly available?		
				Post-trade pricing broadly available?		
Market structure characteristics	Active and sizeable market		Volumes (number of trades and dollar value)	Electronic trading (including hybrids)?		
			Breadth of investors (low concentration)	Exchange-traded?		
			Outstandings	Large number of active market makers		
				Repo financing available?		
				Other secured/forward financing?		
				Related hedging markets?		
Market liquidity	Liquidity	Autocorrelations of returns	Returns		Pricing formula inputs publicly available?	
		Number of days with zero return/volume				
		Roll Metric				
		Amihud (price changes relative to volume)				
						Average number of trades per day
		Effective bid-ask spreads (ex post)				Quoted bid-ask spreads (ex ante)