

MICROSTRUCTURE AND DYNAMIC BEHAVIOR OF STOCK MARKET LIQUIDITY, LITERATURE REVIEW

**Microstructure et comportement dynamique de la liquidité des marchés
boursiers, revue de littérature**

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Abstract

Liquidity has always been a central concern of organized financial market authorities. It is a desirable element, as it is one of the preconditions for efficient markets. It also allows for a better allocation of resources and therefore a better prospect for wealth creation.

A precise definition and a unified measure of this notion of liquidity, however, remain ambiguous. This ambiguity arises from the evolving trend in the theoretical conceptualization of the general notion of liquidity and the possibility of confusing the notion of liquidity of a market with that of an asset.

Moreover, the liquidity of a market is internally linked to its organizational structure. This link is all the stronger since the hypothesis of market efficiency has often been called into question, and since stock markets increasingly rely on new information technologies. It is in this context that a fairly rich literature in the field of stock market microstructure has focused on identifying the determinants of liquidity behavior and its modeling.

This paper aims to situate the notion of market liquidity in the microstructural theory of markets. It is essentially a matter of clarifying the meaning of the concept of "market microstructure", revealing its different characteristics in relation to liquidity behavior.

Keywords: ‘Market microstructure’; ‘Liquidity behavior’; ‘Stock markets’.

Résumé

La liquidité a toujours été au centre des préoccupations des autorités des marchés financiers organisés. Elle se révèle un élément désirable et souhaitable, car elle constitue l’une des conditions préalables à l’efficacité des marchés. Elle permet en outre une meilleure allocation des ressources et donc une meilleure perspective en matière de création des richesses.

Une définition précise et une mesure unifiée de cette notion de liquidité restent toutefois ambiguës. Cette ambiguïté ressort de la tendance évolutive de la conceptualisation théorique de la notion générale de liquidité et de la possibilité de faire une confusion entre la notion de liquidité d’un marché et celle d’un titre.

Par ailleurs, la liquidité d’un marché est intérieurement liée à sa structure organisationnelle. Cette liaison est d’autant plus forte que l’hypothèse d’efficacité des marchés ait souvent été remise en cause, et que les marchés boursiers fassent de plus en plus appel aux nouvelles technologies de l’information. Et c’est dans ce contexte qu’une littérature assez riche dans le champ de la microstructure des marchés boursiers s’est focalisée sur l’identification des déterminants du comportement de la liquidité et sa modélisation.

Le présent papier vise à situer la notion de la liquidité du marché dans la théorie microstructurelle des marchés. Il s’agit essentiellement de clarifier le sens du concept de « microstructure des marchés », dévoiler ses différentes caractéristiques en rapport avec le comportement de la liquidité.

Mots clés : ‘Microstructure des marchés’ ; ‘Comportement de la liquidité’ ; ‘ Marchés boursiers’.

1. Introduction

Since the 1970s, the concept of liquidity has continued to occupy a prominent place in financial systems. A significant part of this interest in liquidity arises from the increasingly pressing needs expressed by companies seeking to finance their external growth. It also arises from the market's inability to absorb the significant volume of assets with a smaller capitalization that investors are seeking to acquire or divest. Liquidity therefore remains an essential quality that organized financial markets (stock exchanges) are called upon to guarantee.

Although it is a concept that holds a prominent position in the literature on the microstructure of organized financial markets, liquidity remains a difficult concept to grasp and characterize. However, a consensus seems to be emerging around the idea that the liquidity of an asset combines the ease with which an investor can use a counterparty for a large order in a short period of time without causing a significant movement in the stock price. Beyond the open debate on its measurement, the behavior of liquidity is of concern to all operators and players in the market, in particular investors and regulators.

Furthermore, liquidity has always been recognized as one of the most critical properties of an effective and efficient organized financial market. Referred to as the ability to trade large volumes of assets quickly at very low cost on an as-needed basis, liquidity covers a wide range of market dimensions, including quantity, cost and time. It is often defined in the sense of an asset and examines the ability to trade a large quantity of assets without significant price lag and within a reasonable time frame.

Our objective in this paper is to analyze, through a theoretical approach, the link between the concept of market microstructure and liquidity behavior.

2. Concept of liquidity, theoretical discussions

In a market finance context, liquidity is the ability to buy or sell assets quickly and in large volumes, easily, without any impact on prices. The more liquid an asset is, the more stable its price remains. A perfectly liquid market would therefore ensure a single price at all times for both buying and selling, regardless of the volumes exchanged.

In the sense of the capacity of secondary markets to produce liquidity, the latter is a notion that is theoretically challenged by monetary proximity due to the existence of transaction costs and asymmetric information. Specialists, on the other hand, rely on the concrete aspects of liquid markets in terms of width, depth and resilience.

In terms of the theoretical evolution of market liquidity, the conceptualization of the notion of liquidity owes to Keynes. The author attributed the following definition to the liquidity of an asset: "the liquidity of an investment asset is the speed with which the wealth incorporated in

it can be recovered... the most liquid asset is the one that can most certainly be realized within a short period of time and without loss"¹.

The definition of liquidity or market fluidity is always a less obvious task. This complexity is mainly due to the possible confusion between liquid market performance and individual stock liquidity. In any case, we point out that there is no consensual conceptual definition of liquidity, but we recognize the use of similar connotations.

But in general, we define the liquidity of a product by the ease of its exchange for cash with an absence of transaction costs, the absence of discount, and with a speed of the transaction.

We also recognize that liquidity is a key concept in organized financial markets. For investors holding financial assets, it means that if needed, they will be able to quickly sell these assets and transform them into money or other assets (these assets can be equity assets, debt assets or some kind of contemporary money...), all within a reasonable time and without major impact on prices, which means that a seller and a buyer can easily find each other.

By remedying Keynes's original definition, "an asset is said to be more liquid if it is more likely to be realized within a short time and without loss". By extending it to the stock market, this definition makes it possible to relate the notion of liquidity to the negotiable character of the asset, the immediacy of exchanges and the regularity of prices on its market. In practice, through the term "certainly realizable" we understand the facility of transformation, which implies the negotiability of the asset.

The transformation of an asset into cash or another more liquid asset (through maturity and risk transformation) becomes "certainly realizable" when there is a market for it to be valued and traded, in addition to its individual qualities of yield, risk and life span.

Subsequently, a "short-term" transformation implies a rapid transformation in terms of waiting time in the market. This aspect is perfectly reflected by immediacy or instantaneity, which implies the permanent existence of counterparty to the demand for liquidity in the market.

However, given the imperfections of the markets (transformation costs and informational asymmetry), the immediacy of transactions becomes difficult to achieve without an exchange mechanism that allows the consolidation of supply and demand in a continuous manner.

Finally, a "no-loss" transformation refers to the possibility of obtaining a transaction price that is as close as possible to the real value of the asset. This aspect refers to the regularity of prices. Obtaining these prices requires an effective and efficient mechanism for their constitution. This task falls to the market, which serves as a conveyor of the information

¹ Keynes, J.M. (1931), *Treatise on Money*. Macmillan, London.

necessary for the valuation of the asset and the setting of an exchange price that is very close to the market price.

Holden, Jacobsen, and Subrahmanyam, (2014) defined market liquidity as the ease with which a significant quantity of an asset can be traded at a low cost and in a short space of time. Thus, liquidity has three dimensions: quantity, time, and cost².

The production of liquidity is then directly linked to the market's performance in improving tradability, promoting immediacy of trading and obtaining regular prices.

The production of liquidity is then directly related to the market's performance in improving tradability, promoting immediacy of trading and obtaining regular prices. It follows that market liquidity is the liquidity produced by the market that ensures that participants who wish to trade an asset can do so quickly and at reasonable prices. We then distinguish between the individual liquidity of the asset and the liquidity of the market. The first corresponds to the attributes of the object to be traded and relates to the liquidity of an asset and its capacity to be transformed over time into available funds. The second refers to the ability of the market to provide participants with the facility to process their trades quickly and at reasonable prices. In other words, the liquidity of the market reflects its capacity to absorb a large volume of transactions without a drop in prices. It depends on the volume of assets held, the frequency of transactions and the resilience of the market.

This performance is not completely independent of the individual quality of the asset, but is essentially based on the structural and organizational aspects of the market.

At this point, it is appropriate to analyze the link between the notion of liquidity behavior and that of market microstructure.

3. Market microstructure: definition and dynamic behavior of liquidity

a. Definition of market microstructure

According to Biais (1989), the regulatory, economic and technological framework of negotiations and the way transactions are organized are the main elements that constitute the microstructure of markets³. As the prefix "micro" indicates, it is in the detail of their execution that financial transactions are studied. Lehalle (2013) went further by defining the microstructure of markets as an "ecosystem" in which the interests of sellers meet those of buyers, thus giving rise to exchanges⁴. Indeed, the millions of orders placed, the regulatory

² Holden, C., Craig, W., Stacey, E., Jacobsen, and Subrahmanyam, A. (2014), 'The empirical analysis of liquidity', Kelley School of Business Research Paper.

³ Biais, B. (1989), *Microstructure des marchés financiers et processus de formation des prix*, Thèse de doctorat, HEC.

⁴ Lehalle, C.A. (2013), *Market Microstructure knowledge needed to control an intra-day trading process*, in *Handbook on Systemic Risk*, Cambridge University Press.

environment, the trading behaviors of agents, the speed of decision-making, the auction systems or the interactions between the different electronic platforms have a direct impact on the price formation process.

The microstructure of markets is therefore the product of the combination of rules relating to exchanges from the receipt of the order to the delivery of the assets. It is conditioned by the degree of automation of the exchanges, the category of authorized orders, the opening hours, the frequency of the diffusion of information, the degree of anonymity... Nevertheless, the classification of the markets is often made on the basis of the combination of the following characteristics:

- The mode and frequency of quotations: this criterion essentially distinguishes markets called fixing markets or intermittent markets from continuous markets;
- The point of intersection between supply and demand, which makes it possible to differentiate between centralized and decentralized markets.

b. Microstructure and dynamic behavior of market liquidity

In general, market structure directly impacts liquidity behavior. To identify and characterize this impact, the literature proposes three main criteria to distinguish between different types of market structures: the time of the trade, the counterparty of the trade and the location of the trade.

With regard to the first criterion, i.e. the time of trading, a distinction must be made between the case where trading takes place at a specific time of the day and the case where trading can take place continuously during the opening hours of the stock exchange. This corresponds to the following two systems: the call market, also known as the intermittent market, and the continuous market.

In the context of a fixing market, we see a synchronization of exchanges that take place at preconceived and pre-established times. Thus, investors' orders are grouped together in an order book called the "market sheet". No exchange is authorized before the time set for this purpose. The linking of orders from the opposite direction ends with the fixing of a theoretical price, the purpose of which is to maximize the volume exchanged. The state of the order book and the theoretical prices are published on a permanent basis. This has the objective of awakening the reactions and behaviors of investors. The theoretical price is restored with any arrival of a new order or with any revision of order by its investor. The real confrontation between the orders is carried out on the basis of the last theoretical price which allows to maximize the number of exchanged assets.

The fixing can also be organized by auction. The participants (the brokers) are physically gathered at the same place called parquet or floor. Prices are notified by an auctioneer. The

participants react to these prices by announcing their offers and requests. The procedure is repeated until a price is determined that creates the balance between supply and demand. No more changes are then allowed. Transactions are carried out on the basis of the single announced price.

Despite the emergence of continuous trading methods, the fixing has retained its place as the opening (or closing) procedure for most stock exchanges. This is notably the case of the Paris Stock Exchange, which replaced the CAC (Continuous Assisted Trading), the NYSE (New York Stock Exchange) and the NASDAQ (National Association of Securities Dealers Automated Quotations), whose theoretical price reveals the best estimate of the value of the asset since the last closing. Indeed, orders arriving overnight or over the weekend indicate information often inferred on other exchanges or published early before the market opens. The Tel Aviv stock exchange and AZX (Arizona Stock Exchange) markets continue to operate on the basis of the unique fixing procedure.

In the context of a continuous market, we see an asynchronization of the trades that take place continuously during the opening session of the market. Unlike the fixing, the asynchronous character addresses the time lag in which investors arrive and in which the trades are carried out. The transactions are bilateral. At any time, an investor observing the progress of the exchanges and having a reason for information or liquidity can intervene in an instantaneous way on the market, which evokes more flexibility and transparency. This intervention can be carried out by different types of orders, namely: the market order, the limit order, the 'at any price order', the stop order or the order at best.

With respect to the criterion of the counterparty to the exchange, a distinction must be made between two cases: the price-driven market and the order-driven market. In the first case, the market is organized around competing market makers, who permanently announce buying and selling prices on the basis of which the other participants can trade in a rapid manner. The difference between the bid and ask prices (Bid-Ask-Spread) indicates the gain generated by a market maker from a buy-sell. In fact, the Bid-Ask-Spread is the most important implicit component of transaction cost. It is the price margin paid by an agent for an immediacy service in the event that the market maker needs to intervene. From this point of view, market liquidity has become synonymous with the immediacy of transactions favored by the factor of the daily existence of the market specialist (the market makers). The Bid-Ask-Spread is then the reward charged to an ordinary agent for this instantaneous service.

In the second case (the order-driven market), the matching of buy and sell orders is done in a direct manner. Investors choose an order to place on the basis of their needs in terms of price and execution time. Under these conditions, a range of orders can be considered (table n°1).

Table n° 1: Order's typology in stock market

	Utility	Execution	Note
Limit order	It allows the investor to control the execution price.	The execution can be partial.	This is the most classical order
Market order	The investor gets the best available price when his order arrives on the market.	The execution can be partial since this order is treated as a "limit order".	The investor does not control the price.
Order at any price	The investor wishes to buy or sell without price conditions.	The investor is assured of full execution as soon as the asset is listed.	Since the investor does not give any price conditions, his order has priority.
All or nothing limit order	The investor avoids partial executions, especially on illiquid assets.	The execution is total - if the quantity of assets at the stipulated price is available on the market - or null.	The price the investor wishes to obtain can be quoted, or even exceeded, without the order being executed, as long as the specified quantity of assets is not available.
Order with a trigger point	It allows the investor to place an "any price" order that is activated as soon as the trigger level is reached or exceeded.	The investor is assured of full execution if there is a quote after the trigger level has been quoted or exceeded.	These orders are useful for positioning the investor in the market or protecting him against a trend reversal, and if he uses chart analysis.
Order a trigger range	It allows the investor to place a "Limit" order which is activated as soon as the trigger level is reached or exceeded.	The execution is partial or total depending on the quantity of assets available.	

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The central opposition between order-driven and price-driven markets is of great interest to regulators, investors and researchers. The aim is to examine the effects of these trading structures on liquidity behavior, transaction costs, and price efficiency, and to conclude on the advantages and disadvantages of the two forms of quotation.

The final criterion for isolating the different types of market structures relates to the location of the exchange. This criterion measures the degree of consolidation of order flows. From this point of view, a distinction must be made between a centralized market and a fragmented market. The former is characterized by the fact that all buy and sell orders are concentrated in

the same place (a trading floor or a central computer, for example), i.e. in an open outcry market or an order book system. At any given time, only one transaction price is applied.

The second market (the fragmented market) has the particularity of processing orders and transactions with different market makers or counterparties. It is therefore similar to a price-driven market. Contrary to the previous case, at a given moment, the asset can be traded at various prices according to the price proposals given by the different market makers. This is particularly the case for the NASDAQ, the SEAQ (*Stock Exchange Automated Quotation : London Stock Exchange*) and the foreign exchange market. This is also the case for assets traded on the NYSE and on regional exchanges that are electronically interconnected through the ITS (Intermarket Trading System).

Finally, it should be noted that a significant number of stock markets adopt intermediate (hybrid) structures. Indeed, continuous markets may be called upon to open or close their sessions with fixing sessions. Centralized markets, on the other hand, can be assimilated to decentralized or fragmented markets, insofar as assets are dual-listed on another competing market. In this case, the order flow for these assets is indeed decentralized. This is particularly the case for the NYSE, which faces competition from regional exchanges. Moreover, order-driven markets can introduce principals in order to maintain the order book.

3. Market microstructure and liquidity supply

Most of the research that has addressed the effects of market microstructure on liquidity behavior has focused on analyzing the mode of quotation, the degree of intermediation, the decentralization of markets, and the information technology involved in trading.

a. The quotation mode

Within the framework of the fixing markets, the process of consolidation of the orders makes it possible to reinforce the potentialities of exchange. This mode of quotation is in adequacy with the narrow values which are the object of less frequent transaction and for less important quantities. This can explain its frequent use in a significant number of emerging and developing exchanges. In fact, fixing markets impose higher waiting costs to investors, as the quotations are not done in a periodic way. Investors feel the risk of non-execution of their orders. In addition, they face a high uncertainty about the future price of transactions. This situation leads to the idea that an increase in the frequency of the fixing can limit the waiting time and guarantee a better execution of the orders.

The prices fixed on the fixing markets can raise criticism about their reliability. In fact, these prices are the result of a single crossing between supply and demand. The efficiency is therefore punctual and the prices do not indicate new information instantly. This circumstance can lead to an exaggeration of the informational impact of events that occur between two

fixing sessions. Moreover, ordinary traders with the means to hunt for accurate information will act in a rational and strategic manner.

From this perspective, Smidt (1979) showed that price changes in conjunction with intermittent trading on the NYSE are larger than the price changes that result from continuous or block trading⁵. On the other hand, Admati and Pfleiderer (1988) pointed out that the concentration of exchanges favors the narrowness of the Bid-Ask-Spread, so the price of the transaction is low and the probabilities of concluding the transaction are high⁶. For his part, Schwartz (1993) affiliated to the temporal consolidation of order flow a relative advantage to the transaction cost⁷. In addition to the immediacy, it makes it possible to reduce transaction costs through the reduction of operational costs and the alleviation of the market impact.

Moreover, the unified nature of the prices obtained thanks to the temporal consolidation of order flows makes it possible to reduce execution costs. Indeed, the exchange price is quickly determined at the time of the fixing, whereas it can take a whole session to find it on continuous markets. Moreover, on intermittent markets, transactions are carried out at the same price and the same cost simultaneously and independently of the size of the orders. In addition, continuous quotation means that orders are executed separately and at different cost levels that can change positively according to their size.

Also, the fact of having a fixed time of exchange known in advance allows an investor wishing to execute a large order to avoid the search for the right counterparty and the disclosure of his intentions. Thus, the market is covered against unforeseen trends in price fluctuations. This also reconsiders the role of intermittent markets in preserving the anonymous status of participants and in hedging liquidity-driven investors against the domination of better informed investors.

In the context of continuous markets, which are generally OTC markets, the permanent arrival of orders and the lasting presence of investors theoretically ensure the instantaneous nature of exchanges and the depth of the market. But the resulting liquidity is somewhat costly, since investors bear the additional direct transaction costs of the market maker's Bid-Ask-Spread. From this point of view, Allais (1987) strongly criticized this quotation regime by associating with it an increase in price volatility and price instability⁸. He also showed that continuous markets penalize the evolution of the real economy by leading to an increase (or no decrease) in transaction costs.

⁵ Smidt, S. (1971), "which road to an efficient stock market: Free competition or regulated monopoly?", *Financial Analysts Journal*, vol. 27, no. 5, pp. 18–69.

⁶ Admati, A., and Pfleiderer, P. (1988), "A theory of intraday patterns", *Review of Financial Studies*, 1, pp 3-40.

⁷ Schwartz, R. (1993), *Issues in market operations. Chapter 7*, pp. 123-135.

⁸ Allais, M. (15 Mai 1987), *Les conditions monétaires d'une économie de marchés: De la réflexion sur le passé ET à la préparation de l'avenir*. Centre D'Analyse Economique.

b. The degree of intermediation

Intermediation in organized financial markets is generally conducted according to an analogous approach between agency markets and counterparty markets, with an obvious preference for the existence of market makers. Biais (1990) has made a major contribution to the analysis of the dissimilarity between these two types of markets⁹. In agency markets, end-buyers provide liquidity to end-sellers through brokers, whereas in counterparty markets, the need for liquidity is met by the intervention of market makers.

Market makers buy and sell to provide temporary intermediation between order flows from the public. Brokers do not commit to the asset but help to bring buyers and sellers together in a spatial transformation. As a result, in the absence of the market maker, liquidity production remains conditioned by the arrival of limit orders. However, there is no obligation for ordinary participants to offer this liquidity even if they earn price margin.

Al Suhaibani and Kryzanowski (2000) conducted a study on the liquidity of the Saudi market (Tadawul) which is found to be an automated market operating with an electronic quotation system called ESIS (The Electronic Securities Information System)¹⁰. This financial market is devoid of any kind of intermediation. Only Wasatas (natural persons) are interacting. The latter are simple order collectors who are in charge of examining the conformity of orders issued by the public and entering them through terminals located at the banks. At the end of this study, the authors concluded that the market is less liquid in terms of width and depth, but it is sufficiently liquid in terms of immediacy. Thus, intraday liquidity follows a U-shaped curve as in most studies of order-driven markets. And finally, they found that the relative Bid-Ask-Spread of the market is high at the opening, but declines throughout the session.

In narrow markets, Garbade (1989) recognizes that brokers are good at providing liquidity¹¹. Indeed, market makers tend to widen their Bid-Ask-Spreads when dealing with less quoted assets. The investor thus bears a higher cost of liquidity if he uses a market maker. On the other hand, the broker can ensure the immediacy of the trade thanks to the lower cost of finding the right counterparty at the request of an end investor. To do this, the broker is required to be constantly informed of the interests of his clients. He thus contributes to promote the integrity of the market because he allows to put in contact investors whose interests are perfectly compatible on the exchanged asset. In addition, investors use brokers in narrow markets because brokerage fees are cheaper than the cost of direct research. Agency markets thus promote economies of scale that completely lower transaction costs and promote liquidity.

⁹ Biais, B. (Septembre 1990), "Formation des prix sur les marchés de contrepartie", *Revue Economique* N° 5, p 755-788.

¹⁰ Al suhaibani, M., and Kryzanowski, L. (2000), "An exploratory Analysis of the Order Book, And Order Flow and Execution on the Saudi Stock Market", *Journal of Banking and Finance* n° 24, p 1323-1357.

¹¹ Garbade, K. (1989), *Securities Markets*. Mc Graw Hill Company. New York. 420 pages.

On the other hand, the size of the market determines the performance of market makers in the counterparty markets. From this point of view, market makers become efficient in their mission of producing liquidity when they have the potential to make their activity profitable thanks to the size of the market.

The larger the trades, the easier it is for the market maker to balance its position and generate margin to cover the counterparty risk. In this case, the Bid-Ask-Spread is lower and the cost of liquidity is lower.

All in all, agency markets make it possible to gain economies of scale and thus offer a lower transaction cost (cost of liquidity) than counterparty markets. On the other hand, the existence of market makers improves liquidity by offering investors an additional source of liquidity. However, this liquidity is costly.

c. The decentralization

When comparing centralized and decentralized markets, the focus is on the risks related to demand fragmentation. Centralized markets offer a major advantage in terms of transparency. Indeed, the unified nature of the transaction price expresses a general view of the supply and demand situation. On the other hand, decentralized markets do not have the capacity to provide this transparency advantage because of the fragmentation of demand and the disarticulation of information. Moreover, the efficiency of decentralized markets is conditioned by the non-continuous nature of exchanges and the reduction of liquidity.

Due to the automation of decentralized markets, the continuous nature of quotations is subject to mechanical risk. Thus, a possible breakdown of the computer system can hinder the activity of the operators by depriving them of dealing in time and of protecting themselves from certain risks.

Apart from the mechanical risk, the continuity of quotations on decentralized markets is sometimes subject to time differences. The discontinuity of the exchanges caused by this time difference is the factor of an increase of the volatility on the suspended markets during the closing hours.

In the case of centralized markets, the risk corresponds essentially to the deconcentration of liquidity in time and space. In this respect, Amihud and Mendelson (1986) pointed out that when an asset is traded on several markets (multi-listing), the liquidity of each market is revised downwards because of the sharing of order flow¹². This proposition was confirmed by Pagano (1989), who pointed out that when an asset is traded on two markets, investors tend to

¹² Amihud, Y., and Mendelson, H. (1986), "Asset Pricing and The Bid-ask Spread", *Journal of Financial Economics* N° 17(2), pp. 223-249.

place their orders on the market with the largest number of participants¹³. Even if it is relativized by the transaction costs that justify the simultaneous existence of the two markets, this behavior will contribute to the disappearance of the less liquid market.

In the same vein, Economides and Siow (1988) have shown that the level of liquidity has some influence on the multiplication of markets¹⁴. Indeed, participants generally have a preference for liquid markets because they offer them the possibility of trading at lower prices than illiquid markets. The division of markets reduces their liquidity by the deconcentration of participants. However, liquidity remains a self-generating phenomenon, which implies a strengthening of the performance of the most liquid markets and a progressive disappearance of the others.

Moreover, despite their evolution and importance, it seems that electronic trading systems have not led to the disappearance of the market making function. This observation has been widely highlighted by Madhavan (2000), for whom market makers make it possible to maintain two important missions. On the one hand, these actors serve as a relay between the market and the arrival of investors outside of trading sessions¹⁵. Their portfolios make it possible to reduce the temporary desynchronization between the arrival of buyers and sellers. They also guarantee an immediate service of the exchanges. Market makers are complementary to electronic networks that allow investors to meet on site. On the other hand, market makers play a major role in stabilizing prices. Such prices that emerge from the confrontation between supply and demand thanks to electronic systems can experience rapid fluctuations according to the quantities exchanged and/or anticipations of informational news. One of the tasks of market makers is to correct prices by acting on order flow in order to adjust their position (maintaining the Bid-Ask-Spread). In this way, they help to calm price fluctuations and make them stable.

Fouquet and Haas (2001) have argued that the main consequence of the emergence of electronic trading systems has been to challenge the role of traditional intermediaries while recognizing the crucial role of market makers¹⁶. Thanks to lower operating costs (limited number of staff, no physical infrastructure), these systems provide investors with the possibility of trading at low cost.

With the development of electronic platforms, market makers are acting as liquidity risk management mutuals. Their existence is necessary to guarantee investors the speed and

¹³ Pagano, M. (1989a), "Trading volume and asset liquidity", *Quarterly Journal of Economics* N° 104, pp. 255-274.

¹⁴ Economides, N., and Siow, A. (1988), "The division of markets is limited by the extent Of Liquidity", *American Economic Review* 78, pp. 108-121.

¹⁵ Madhavan, A. (2000), "Market microstructure: A survey", *Journal of Financial Markets*, vol. 3, no. 3, pp. 205-258.

¹⁶ Fouquet, F., and Haas, F. (Février 2001), "Impact Des Mutations Technologiques sur les Marchés de gré à gré", *Bulletin de la Banque de France* N° 86, pp. 61-71.

immediacy of trading. On the other hand, the appearance of these platforms has not necessarily changed the function of market makers. The availability of the counterparty requires significant capitalization and the competition required by electronic platforms significantly reduces the profitability of this intermediation modality.

Conclusion

Through this paper, we have tried to situate the notion of liquidity in the framework of the microstructural theory of markets. The notion of liquidity, whose behavior varies from one market to another depending on several factors, generally refers to the capacity of the market to ensure that investors wishing to trade an asset can quickly complete their transactions at reasonable prices.

Two organizational bases impact the behavior of market liquidity: the spatial and temporal consolidation of order flows and the existence of intermediaries. The first basis stems in principle from the fixing and the centralization of supply and demand. The aim is to optimize the number of limit orders compared to market orders issued by the public. In this case, liquidity is produced at lower cost and with low volatility. The second basis is the presence of market intermediaries and particularly market makers. Their existence in the market guarantees a service of negotiability supported by the economies of scale of transaction costs and information costs. Their portfolios thus constitute a buffer between supply and demand in the event of a temporary imbalance in the market.

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