

Competitive Advantage, Online Brokerage and IT: evidence from Italian and German companies

Andrea Carignani

Università Cattolica del Sacro Cuore - Dpt of Business Administration, Milan, Italy

Frank Seifert

Universität Regensburg - Institut für Bankinformatik und Bankstrategie (IBI)

Abstract-Retail banking is rapidly driven by the use of innovative technologies. This is especially true for direct brokers that rely on the fast execution of stock market transactions via electronic distribution channels. Based on the framework of the resource based view we evaluate the contribution of front-end applications, middleware systems and back-end technologies to competitive advantage of direct brokers. Consistent with literature reviewed concerning IT as source of competitive advantage and IT-related competitive advantage in banking we find little potential for sustainable competitive advantage, even in the IT driven industry of direct brokerage. Given the present state of technologies employed, back-end systems reveal the highest potential for competitive advantage. We doubt, though, that it is of a sustainable nature. The findings presented rest on a case evaluation of the German and Italian brokers. This research in progress provides the formulation of hypotheses that are the basis for a more detailed research incorporating the more mature American direct brokers and investigating dynamic capabilities for continuous IT innovation, that might be source of sustainable competitive advantage.

I. INTRODUCTION

Retail banking is rapidly driven by advances in information technologies (IT). Not only since the automation of back-offices and the use of legacy systems for the banking transactions and data has IT become a prime determinant in the banking industry. Moreover, in retail banking the customer has had a very close contact to the bank's information systems infrastructure, ever since the introduction of the automatic teller machine (ATM).

The current hype about direct banks, direct brokerage, mobile banking or simply internet banking suggest that the importance of IT in the distribution of financial services is rapidly increasing. This is especially true for direct brokers, who rely on and take advantage of the fast execution of securities transactions for private customers. Their reliance on electronic distribution channels leads to suggest that they can gain some sort of competitive advantage by leveraging innovative technologies for distribution.

Success in banking increasingly depends on the ability to master IT. The reason is simple: information is both the raw material, the product and now also one of the main elements of the distribution activity of a bank.

Nevertheless IT in banking is often seen as strategic necessity rather than as source of competitive advantage. The necessity view rests on the finding, that the employed technologies are commodities that are readily available on factor markets, rather than unique resources. To explore the question of IT related competitive advantage in banking we

outline the framework of the resource based view to treat IT as potentially valuable resource. After reviewing some literature on IT and competitive advantage and IT-related competitive advantage in banking we turn to an analysis of the direct brokerage industry in Germany and Italy. Clearly direct brokerage is a part of the banking industry most heavily dependent of information technology. We classify information technology employed in direct brokerage to evaluate its potential impact on competitive advantage in the light of the resource based view.

II. GAINING COMPETITIVE ADVANTAGE – IT AND THE RESOURCE BASED VIEW

A. Foundations: The Firm in the Resource Based View

The resource based view interprets the firm as bundle of resources [1]. Resources are usually defined broadly, for example as brand names, patents, information infrastructure, managerial skills or corporate culture Wernerfelt [2] introduces resources as “anything which could be thought of as a strength or weakness of a given firm.” Barney [3] adds a strategic focus when he defines resources as assets (...) enabling a firm to conceive of or implement strategies that improve the firm's efficiency and effectiveness. Here we maintain the usual broad definition of resources and include all tangible and intangible assets in control of the firm. Still it is important to hint at the resources importance for implementing the firm's strategy.

Resources as tangible and intangible assets, that enable a firm to formulate and implement its strategy may well include corporate reputations, human skills or financial endowments. The resource based view further uses the concept of organizational capabilities. These are not defined consistently among authors, usually they are seen as some sort of higher order resource.

Capabilities in their most basic form¹ are thought to arise from the interaction of resources. So they basically comprise a combination of resources. The identification of capabilities may be conducted by examining the functional activities of the company, as they are most likely being developed in functional areas [5, 6]. A more dynamic concept defines organizational capabilities to be ‘dynamic routines that govern the ability of an organization to learn, adapt, change and renew over time’ [7]. Dynamic capabilities are embedded in the processes and routines of the firm and can

¹ See Collis excellent research note [4] for a more detailed discussion of the varying definitions of capabilities.

thus neither be separated from the firm nor can they be adequately formulated [8]. The reason for the latter property of dynamic capabilities is that they are resting at a higher level and cannot be perceived or grasped by single individuals.

For the purpose of this paper the both definitions of capabilities are useful. Capabilities are thus defined as combination of interacting resources. We will refer to the second definition as dynamic capabilities. Still for our purpose we will restrict them to capabilities for the innovation of IT related products and processes in the distribution of financial services. A scope comprising the ability to adapt the entire organization to rapidly changing environments in Schumpeterian competition [9] would simply be too broad in our context.

B. Criteria for Competitive Advantage

Competitive advantage may be defined as the ability to earn above average returns in a given industry. According to the framework of the resource based view several criteria are required for resources and capabilities to be the source of such advantage.

Value contribution for strategy: It is usually assumed that the resources controlled by a firm that enjoys a competitive advantage are somewhat superior to other readily available resources and allow the firm to implement a superior strategy. Superiority can for example be achieved by leading to a more efficient production of products or services – and thus lead to a cost advantage – or that they provide means to meet customer demand in a better way than competitors – hence that they provide a differentiation advantage [10, 11]. In essence – as a first criterion - the resources have to contribute to the formulation and implementation of a company's strategy to be valuable.

Rareness: One basic assumption of the resource based view is the uniqueness of resource bundles residing in a firm [12, 13]. Heterogeneity of resources is a necessary condition for firms to earn rents. Rents are defined excess earnings greater than break even profits in the industry. Rents are attributed to scarce productive factors. The scarcity of the productive factors - or resources - is the basic reason for competitors being unable to acquire the necessary resources to compete the rents away. In essence rents are the value created by the competitive advantage the firm achieves implementing its resource based strategy.

Although limited in supply, equivalent resources may be held by a (small) number of firms, which will therefore be able to implement equally efficient strategies. As long as the supply of resources is limited to these few firms and shorter than demand for the resources these firms will be able to implement an equally superior strategy to the firms not endowed with the resources and earn rents, hence enjoy a competitive advantage.

Suppose heterogeneity of resources would not exist: all firms in an industry would be able to implement the same strategies. Once one firm would come up with a superior strategy all firms in the industry – or outside firms that enter the industry - would readily copy the strategy and compete all profits away.

Imperfect imitability and imperfect substitutability of resources are the other two criteria required for a firm being able to exploit rents from the resources controlled [14, 15]. Inimitability is closely connected to the process of acquiring the resource and will be at its peak when the resource has been accumulated internally. In the terminology of Dierickx and Cool [16] inimitability of resources stems from the resource accumulation process being characterized by either time compression diseconomies, asset mass efficiencies, interconnectedness of asset stocks, asset stock erosion and causal ambiguity.

- Time compression diseconomies are due to accumulation processes that require a certain span of time and exhibit increasing returns to the input of time. They could be described as a first mover advantage [17] that cannot be competed away, given the early mover can stay ahead by keeping the future development process at least at the same rate as its competitors. This notion is closely connected to the idea of path dependency, that is that present decisions on altering and using the existing resource base depend on historic decisions of investing in resources. Further the development of some resources – such as tacit knowledge – requires time and can thus not be readily imitated by any competitor.
- Asset mass efficiencies can be described as economies of scale in a given resource. A simple example is word of mouth advertisement and increased product awareness as cited by Dierickx and Cool [18].
- Interconnectedness of asset stocks refers to synergetic effects between stocks. Basically the value of a resource A increases due to the presence of resource B. This can be seen as a type of economies of scope or synergies between resources.
- The depreciation of a resource base is referred to as asset stock erosion. The competitive advantage over rivals shrinks with the erosion of the resource base, e.g. when a brand reputation for high quality is not nurtured by the ongoing delivery of high quality services.
- Causal ambiguity inhibits imitation when an accumulation process is stochastic and the outcome highly uncertain. More specifically causal ambiguity refers to uncertainty about the resources that are underlying the competitive advantage of a company. Tacitness, complexity and firm-specificity of the – internally accumulated – resource are sources of ambiguity [19].

Imperfect substitutability is the last condition for rents generated by a resource to prevail. Different resources might have the potential to serve the same functions as existing ones and thus provide a basis to compete the rents away [20]. The existence of substitutes generating equivalent services in strategy formulation or implementation neutralizes a possibly existing inimitability. Still the conditions of value for the company's strategy and rareness have to apply to the substitute for it to be valuable in itself. Otherwise the existence of a substitute leads to all companies owning resources with no contribution to competitive advantage.

TABLE I
CRITERIA FOR RESOURCES TO YIELD COMPETITIVE ADVANTAGE

Value contribution for strategy	Rareness	Inimitability	Non Substitutability
Resource contributes to formulation or implementation of strategy	Resource is controlled by a limited number of competing (or potentially competing) firms	Resource cannot be imitated due to time advantages, scale advantages, synergies, erosion of resource base and causal ambiguity/complexity	There are no close substitutes for the resource offering equivalent services for strategy formulation or implementation

Now we can sum up the criteria in question: Value contribution for strategy, uniqueness or better rareness, inimitability and non substitutability. These criteria are similar to the ones developed in Barney [21], being the framework that can probably be most operationally used for analyzing particular resources. Table I summarizes the criteria for resources to yield competitive advantage.

Note that capabilities, as defined above are analyzed using the same criteria as employed for resources. The difference between resources and capabilities usually boils down to a higher likelihood of capabilities to be inimitable. This is due to the higher complexity of the combination of resources and the added potential for causal ambiguity. This applies even more to dynamic capabilities, as they are further embedded in the organizational context. In terms of substitutability, rareness and value for implementing a strategy capabilities are not necessary at any advantage to resources.

We now go on exploring the connections between information technology and competitive advantage. The notion of leveraging IT as resource for competitive advantage has been discussed in the literature, albeit with inconsistent findings.

C. IT as source of competitive advantage

Initial discussions of the strategic value of information systems have been enthusiastic. Clemons [22] discusses internal and external IT applications as source of competitive advantage. In essence – and to interpret his 1986 findings in the light of resource based reasoning - he sees competitive advantage to be attributed to a certain uniqueness of the IT systems shielded by barriers to imitation. The commonly expressed view states that IT in order to contribute to competitive advantage has to be closely linked to strategy [23] and to be used to coordinate and integrate across functional departments [24] or across value chain activities [25].

More recently the view has been established, that IT itself does not lead to competitive advantage, as IT usually degenerates to a commodity that is readily available for all competitors at factor markets. IT is rather seen as strategic necessity [26, 27, 28] that firms have to employ to take part in competing in the marketplace with no causality for competitive advantage. Rather the failure to apply information systems that are seen as strategic necessity puts the firm at a competitive disadvantage. Competitive advantage by IT itself can then only be achieved through

customizing and extending on standardized software, as in the case of ERP systems [29].

Still IT may have substantial impact on competitive advantage, if not by the IT systems per se. Powell and Dent-Micallef [30] see three remaining possibilities for IT-based competitive advantage:

(1) IT advantages through continuous IT innovation, (2) first mover IT advantages shielded by time compression diseconomies, (3) IT advantages through synergies of IT with human or organizational resources.

According to the authors the first two reasons are likely to be only a source of temporal competitive advantage that is competed away due to shortening IT life cycles. They suggest that the third reason – to seek IT advantages through the combination of IT with human and business resources – is the adequate path to IT-based competitive advantage [31, 32]. Powell and Dent-Micallef's empirical study show especially the ample importance of human resources to improve both IT and financial performance [33].

In our view these results hold very well for internal applications that are facilitated for various activities of strategic planning, controlling of operations, customer advice or operational workflows which will only be performed 'better' when human staff leverages the potential opportunities offered by IT.

For these internal applications IT contributes to the strategy of the firm, as tasks of planning, producing or controlling to name but a few are performed more efficiently. The IT applications are – given the widespread availability of standard software – not rare in itself. The configurations are already more unique. But the real value lies in the usage of the applications by the company's staff. The rareness is embedded in the combination of IT and the human skills and motivation to leverage its potential. These synergies are also at the heart of inimitability. The capability one could label "company IT skills" is likely to be grown over time as well. As Barney [34] points out a highly efficient management team could be a substitute. Still a management team of that sort is likely to be a unique and rare resource as well, so that "company IT skills" are likely to be a valuable capability with some impact on competitive advantage. In fact the value of a combination of human and IT resources has been empirically shown for the retail industry by Powell and Dent-Micallef [35].

Still, with external applications the case may be slightly different. Technology employed in the electronic distribution of services is for the most part used by the customer without a great deal of impact by human company staff. While it is embedded into the organizational context, e.g. into the internal processes and it is subject to channel controlling, in its every day operation it is mainly driven by customer contact. Electronic delivery provides some benefits – convenience, availability, mobility – to the customer and, next to an increased turnover, provides cost advantages to the banking firm, as the customer conducts a great deal of his transaction without the help of any banking staff. As these advantages can readily be employed by any company due to hardware and software like ATM-Machines or servers and software for internet banking being obtainable at factor markets a competitive advantage is unlikely to be found in

each channel IT application itself. There is little opportunity for human resources to enhance the value of the applications themselves - like it is the case with internal applications. A combination of IT resources may rather be source of competitive advantage. A capability to continuously configure the external applications according to the needs of the customers and the competitive scenario in the marketplace is the second possibility for IT related competitive advantage in external systems.

The case is similar for automated software systems that act internally, such as back-end systems for data storage or middleware systems that connect databases, distribution channels, applications of cooperating providers and the like.

Most of these applications operate 'autonomously' without manual processing. The case resembles the one of distribution systems. In the direct operations of IT there is no human staff involved. An example could be the direct routing of customer orders to the stock market. Again the configuration of the systems is at the heart of performance, quality, reliability and range of services offered. Combined with management capabilities the performance and impact on competitive advantage of IT will well be enhanced. Still for each time being, competitive advantage resides in the configuration of IT systems.

To be very clear on one important issue, we do not want to state here that IT to be a source of competitive advantage does not have to be combined with co-specialized human or business resources to become source of competitive advantage as a capability. Clearly the configuration of IT systems is always an outcome of managerial decisions and thus has already been combined with some sort of human resource. Still we want to explore cases where the IT systems and the product or service offerings they enable may lead to competitive advantage. We acknowledge the possibility of dynamic resources yielding further input to competitive advantage by fostering continuous IT-innovation.

Powell and Dent-Micalef recognize this possibility of an IT related advantage through continuous IT innovation [36]. While they see this as a source of temporal competitive advantage only, a dynamic capability for IT innovations would clearly be a source of sustainable competitive advantage. According to the framework introduced a dynamic capability can hardly be imitated, as it is closely tied to organizational processes and is heavily path dependent, e.g. as tacit knowledge is one of the resources it consists of. As a capability it is itself a combination of resources which are interconnected. Given path dependency and interconnectedness ambiguity is likely to be high as these interconnections are rarely visible from outside the company, nor will they be easily understood from inside. The capability is prone to be very rare and valuable for the strategy of any company competing in for customers via electronic distribution channels. Substitutability is restricted in an environment where the company relies on external applications for the distribution of its services.

Findings of Geroski, Machin and Van Reenen [37] support the notion of innovative capabilities as valuable source of competitive advantage. The authors were able to attribute performance effects of innovations to general

innovative capabilities of companies rather than to the innovations themselves.

III. IT RELATED COMPETITIVE ADVANTAGE IN BANKING

There are a few studies concerned with IT related competitive advantage in banking. We briefly review Floyd and Wooldridge [38], as they focused on retail banking technologies, strategies and performance effects. Further we have a look at the study of Roberts and Amit [39], which introduced to us the notion of continuous innovative capabilities as source of competitive advantage in banking.

In a study of American retail banks in 7 Western and Midwestern states Floyd and Wooldridge [40] found significant influence of strategy type on technology adoption. Technology adoption was explored in two classes: product IT and process IT. Namely the strategy type product breadth strongly influenced product IT (ATMs and PC-banking). Product IT is seen as a strategic necessity though, rather than a resource deployment in pursuit of competitive advantage. A segmentation strategy, i.e. the focus on a high margin market segment strongly influences the adoption of process IT (Online transaction processing and internal applications for managerial support). The study found product IT to have the most significant performance effects (on ROA), while process IT effects were found to be insignificant for performance.

These results may lead to suggest that IT is a valuable resource in the retail banking industry and source of competitive advantage, especially on the product and distribution side. Floyd and Wooldridge themselves suggest that product IT is a strategic necessity, rather than a competitive advantage. This is supported by CEO interviews conducted in the study. The results do not show the sustainability of any competitive advantage, nor do they indicate that IT per se has independently an impact on performance. Results suggest that IT in together with the strategy of product breadth has a positive impact on performance. IT is thus very likely to be a valuable resource, especially when combined with an adequate strategy. As the study did not account for other human or business resources - except for some quotations in the interviews that suggest the importance of human resources - there is no statement on possible on this issue.

The cross sectional nature of the study and the commodity nature of ATMs and PC home banking (product IT) may lead to suggest that only a temporal competitive advantage may have been derived for the time of the survey. The temporal competitive advantage thus may rather be due to some innovative capability to introduce the right banking products to support a given strategy and delivery channels for the time being.

Roberts and Amit [41] examined the innovative capabilities in the Australian retail banking sector. They analyzed the flow of new products and processes during the 1981 to 1995 period. They show that the innovation of e.g. the ATM network has been subject to a tradeoff between value to the customer, which is derived from accessibility of the ATM network and uniqueness of the resource to the bank, as the expansion of the ATM networks was quickly driven by linkages between banks' ATM networks, whereby

unique resources were transformed into widely accessible resources setting off the value for the individual firm. Hence the pattern of innovative activity over time may provide another source of competitive advantage that supersedes the impact of single innovations at one point of time.

The innovative activity of banks has been analyzed in some detail. The level of annual innovation (1), the likelihood of moving first (2), the focus of innovations on areas of distribution, process and product (3) and the consistency of innovative activity over time (4) has been correlated with Return on Assets (ROA). (1), (2) and (3) have been significantly and positively correlated with ROA. This suggests that innovative capabilities of banks can be a source of competitive advantage over time and that the actual configuration of IT per se is an outcome of that capability rather than an underlying cause of competitive advantage. In the following paragraphs we explore this issue further with the example of the direct brokerage market in Germany.

IV. DIRECT BROKERAGE

A. Direct brokers characterized

Direct brokerage firms will be defined as banks that offer a variety of services concerning trading at stock markets over virtual channels to retail customers. By definition they have neither branches for transaction services nor for advice. Virtual channels thus include telephony (both mobile and conventional), telefax and PC. PC banking comprises internet banking and banking facilitated by other – proprietary – service providers like MiniTel in France or T-Online in Germany. Typical products of direct brokers are stocks, bonds, mutual funds, options and other derivatives. They often offer access to various stock markets, preferably to the major markets in their respective home country and additionally to the New York Stock Exchange and the NASDAQ.

The consumer enjoys several advantages including 24 hours access to his account and trading hours that usually are only restricted by the stock markets' opening hours. Orders are directly routed to the stock market and confirmation on order processing is usually given rapidly. The transaction fees are up to 80% lower compared to similar transactions by conventional branch banks. A discount up to 100% is frequently offered for mutual funds.

Direct brokers have introduced a new business model for the brokerage market. They operate no branches and they do not even offer advice over their direct channels. Instead they show characteristics of information intermediaries by providing the necessary information for informed trading to their customers through their electronic channels, mainly the internet. Thus direct brokers target sophisticated customers that conduct their transactions on an individual basis. These customers enjoy a distinctive cost advantage.

This cost advantage rests on savings in branch structure, reduced personnel costs and a sophisticated usage of technologies, both on the delivery side and in the back-office. One major source of cost savings is the direct routing of individual orders to the stock markets. By reducing the need for manual postprocessing of orders costs are reduced

dramatically. Further the likelihood of mistakes is reduced and hence the quality of service enhanced.

B. Online Brokerage Technology

A direct broker system architecture can be split broadly into three different levels: front-end, middleware and back-end.

Front-end user devices such as PC, telephone, or fax, which enable the customer to communicate with the brokerage application. The variety of distribution channels at the front-end is important for two reasons. First, a large number of distribution channels gives access to as wide a market as possible. Second, it gives customer different options for trading should the primary channels be unavailable.

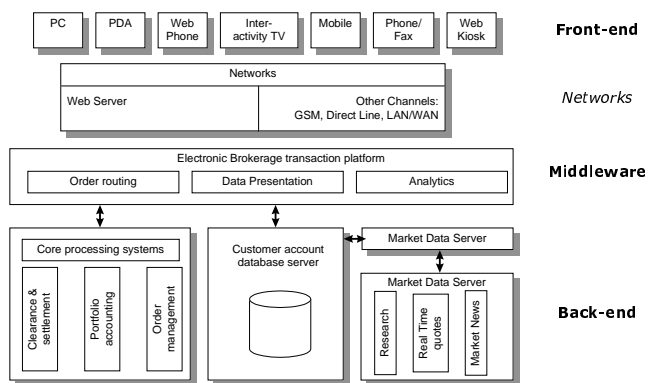
The electronic brokerage application server as **middleware** is the heart of the brokerage system and houses the primary logic of the application, including elements such as security measures and order routing to the core system. Analytics such as performance measurement, pricing and planning tools frequently form part of this layer as well.

One of the key features of the transaction platform is that it serves as the main gateway for users and devices for back-end service providers and thus largely determines the degree of the brokerage solution's flexibility.

On the **back-end** side a key issue for European online brokers. Most players, being a spin off from major banks, have relied on the mother's information systems and do therefore employ a number of legacy systems that were not originally designed to operate in such a volume-intensive and real time environment. Further they migrated to online processing from channels like fax or telephone. Real time transactions and intraday trading² require that portfolios are maintained on a real-time basis and not through overnight batch-updating. Legacy systems and the back end are therefore not only a major issue for scalability, but may also limit front-end functionality and product range, such as the markets served via clearing and settlement systems. Additionally third parties provide information content and market data.

The online brokerage business with its intense transaction load and the importance to customer of speed and reliability is one of the most technically demanding area of the finance industry. Only an advanced technical architecture enables a broker to remain competitive. Among a number of criteria such as security, back-office administration, range of products and instruments, data security and analytical capabilities, is it possible to identify scalability and flexibility as the key requirements for a successful online brokerage solution.

² Intraday-Trading denotes the possibility to use the cash credit of transactions for new trades immediately.



Source: J.P. Morgan

FIG. 1 ONLINE BROKERAGE TECHNICAL ARCHITECTURE

C. History of the German and Italian markets

Germany

The Direct Anlage Bank (DAB) was founded as the first German direct broker in May 1994 as a subsidiary of the former Bayerische Hypotheken- und Wechselbank (HypoBank). At that time Hypobank was a regional private bank in Bavaria. By now Hypobank has merged with Bayerische Vereinsbank in 1998 to become the new HypoVereinsbank, currently the second largest German bank by asset volume. HypoVereinsbank today owns 100% of DAB.

One month after the foundation of DAB ConSors went to the market as subsidiary of SchmidtBank, a regional private bank in northeast Bavaria. In April 1999 ConSors successfully conducted its IPO at the German Neuer Markt to be the first German direct broker to be quoted at the stock exchange. DAB has announced its IPO for November 1999.

With the establishment of comdirect in February 1995 Commerzbank was first among the big three German private banks to found its direct brokerage subsidiary. Deutsche followed in September of the same year by founding Bank 24. While both comdirect and Bank 24 have been launched as full service providers offering e.g. current accounts and loans, comdirect has been repositioned in September 1997 to focus on direct brokerage. Bank 24 continued with a broad product range to be reintegrated with the retail branch business of Deutsche Bank in September 1999.

TABLE II
DIRECT BROKER IN GERMANY

Broker	DAB	ConSors	Comdirect	Bank 24
Founded	5/1994	6/1994	2/1995	9/1995
Accounts (5/99)	90.000	130.000	155.000	90.000
Markets	DE, NYSE, NASDAQ, CH	DE, NYSE, NASDAQ, CH	DE, CH, AT, EU	DE, NYSE, NASDAQ
VAS (Value Added Services)	Real-time quotes, Companies research, charts, Finance Tools, Portfolios, News Service	Real-time quotes, Companies research, charts, Finance Tools, Portfolios, News Service	Real-time quotes, Companies research, charts, Finance Tools, Portfolios, News Service	Real-time quotes, Companies research, charts, Finance Tools, Portfolios, News Service
Channels	Internet, T-Online, Phone, Fax	Internet, T-Online, Phone, Fax	Internet, T-Online, Phone, Fax	Internet, T-Online, Phone, Fax

Italy

Internet trading is forecast to experience exceptional growth in Italy but will not become a real mass market for at least the next five years.

It is expected to be 1.3 million internet brokerage accounts by the end of 2003 that would represent approximately 20% of the retail shareholding population at that time.

In Italy companies effectively started offering internet trading services only at the beginning of 1999. At present there are only three players of importance: Fineco, Directa and Mediosim. All of them offer trading services for shares that are listed on the Milan Stock Exchange and derivatives.

Only Fineco in August of 1999 began to offer trading services in shares listed on the NYSE, the French and German stock markets.

Major Italian banks are anchored to traditional branch network model: in Italy major banks are still opening branches to increase their market and business penetration.

For this reason it is expected specialist and very few banks with a strong strategic vision to build up successful sales-driven business, whereas traditional banks will approach online trading market mostly as a demand driven move.

TABLE III
DIRECT BROKER IN ITALY

Broker	Fineco	Directa	MedioSim
Founded	Jan.99	March 96 (on the Net Dec.98)	Dec.98
Accounts (Sept. 99)	12.000	7.300	2.000
Markets	IT, NYSE, NASDAQ, F, DE	IT	IT
VAS (Value Added Services)	Real-Time Quotes, News Service, Companies Research, Charts, Portfolios	Real-Time Quotes, News Service, Companies Research, Portfolios	Real-Time Quotes, News Service
Channels (ordered by n° of customers)	Internet, PC, SMS/WAP, Phone, Fax	Internet, PC, SMS, Phone, Fax	Internet, PC, Phone

V. DISCUSSION: IT AS VALUABLE RESOURCE TO ONLINE BROKERS

Having characterized Direct Brokers in two countries with their basic business model, technologies and historical background in the light of two different markets in Europe, we now turn towards a brief discussion of technology as a source of competitive advantage. As research in progress is being presented here the task is to formulate hypothesis that may be tested via an empirical survey or through extensive case studies in the companies introduced above. Testing of the hypotheses in the more mature American market would be of further benefit.

Concerning **front-end services** that basically comprise the distribution channels offered to the customer there is little distinction between the competitors. The main distinction lies in the service philosophy, that is expressed e.g. in all German direct brokers having a bank representative in a call center taking orders and queries but ConSors. ConSors has a call center team for queries, still orders are only taken with a touch tone phone system, that is reducing operative costs at

an substantial amount. For the Italian brokers MedioSim offers a less complete channel mix, what might be due to its late entry into the market. However, we are confident that the channel offerings of all competitors will equalize.

This we also foresee for the products offerings. The more mature German market provides ample evidence for this suggestion. All competitors have similar offerings concerning shares, bonds, mutual funds, options, futures or loans offered. Distinctions are most prevalent in the offering of intraday-trading and in the access to IPOs. The later is a big issue for direct brokers with high potential for competitive advantage. Access to IPOs can only be accomplished by a close co-operation with an investment bank, or in the case of the German brokers by leveraging the connection to the mother institute. The case of American direct brokers indicates another option. E*Trade has founded E*Offering to be its own investment bank. More recently Schwab, TD Waterhouse and Ameritrade announced the foundation of a joint investment bank with concentration on IPO activities as well.

Hence channel and product offerings are of immense value to brokerage firms. They can be considered the basic element of their business model. Electronic channels are the basis to offer fast trades *and simultaneously* ensure a lean cost basis that cannot be matched by any branch based competitor. Still in terms of rareness and inimitability our brief review indicates that all innovations – and this is also true for the product side – are hardly rare and can easily be imitated. Given this limitations it seems irrelevant that single channels can be viewed as substitutes to each other. A broad range of channels as offered by all competitors cannot be substituted, given the strategy and business model of direct brokers. Customers seem to expect a broad channel offering, which therefore may be termed a strategic necessity rather than source of competitive advantage.

The main issue with **middleware systems** is the flexibility they provide. Most of the channel offerings on the front end side and of the product offerings and markets served on the back-end side hinge on the flexibility provided by the middleware employed by the broker. Flexible middleware systems are needed to integrate new channel offerings quickly. They connect back-end legacy systems, clearing and settlement systems and databases to the distribution channels. The rapid introduction of new channels such as PDAs or WAP mobile banking solutions, which are currently not offered by any European broker, is dependent on the flexibility provided by middleware systems. Further flexibility of middleware is required to introduce new products and services. The integration of new information content provided by third parties has to be integrated by middleware systems in the same fashion as the access to new markets over additional clearing systems. The pace of product and channel innovations one can observe in the direct brokerage industry hints at the demands on middleware flexibility and modularity.

In terms of value and substitutability decent middleware systems are surely essential to online brokers. Still rareness and inimitability are low, given that vendor solutions from companies such as Brokat, DataDesign, Olivetti, Wang Global are already in place and are being implemented by

the major German and Italian competitors. As long as these solutions provide a greater flexibility compared to proprietary systems middleware cannot be the source of competitive advantage to any broker.

The main issue with **back-end systems** are the limitations they impose on the transaction speed and reliability. As there are tremendous demands imposed from the market concerning these factors, systems ensuring real time processing are essential. Intraday trading and quick transaction confirmation rests on the back-end systems' capability for real time processing. Above we have identified the scalability of the systems to be the main requirement. Indeed, most brokers have faced serious problems in times of high transaction volumes, indicating that they have not been able to keep track with their customer growth rates.

The main components of back-end systems are the processing systems which connect the broker to the various markets and the legacy systems which host the customer and transaction data. Here the issues of scalability are most prevalent. For the other components on the back-end side most broker heavily rely on co-operations with content providers such as Teledata, Deutsche Börse AG, Reuters or Handelsblatt, Radiocor, Tenfore, ArcaBorsa and others for news, market analysis and quotes. Here issues of scalability are largely transferred to the data provider, at least on the technical side. The issues are maintained at the broker as customer dissatisfaction is attributed to his offerings.

Clearly the problems of transaction load experienced by most brokers imply that highly scalable and reliable systems are a rare resource with tremendous value to the firm, as the services provided and their speed are inherent in the product offering. The constant transaction growth requires a continuous work at the systems, which are usually proprietary by nature, so that the solutions in hand are constantly altered and thus imitability is restricted. Proprietary real time processing back-end systems can presently hardly be substituted by some other sort of technology or organizational form such as outsourcing agreements. Although some providers offer outsourcing, for example clearing and settlement services, it has to be ensured that these services are provided with at least equivalent quality and cost efficiency to the in-house services. Still software vendors are working at standard software and the potential growth of the direct brokerage industry lets us believe that standard products will be on the market in the foreseeable future. So we argue that proprietary systems will probably be substituted by standard products, that offer a better scalability, flexibility and modularity than existing systems. Then competitive advantages of existing proprietary systems over competitor's systems will vanish.

So in summary we can conclude that the impact of back-end systems to a direct broker's competitive advantage can considered to be quite high at the moment. It is most likely to be retrenched by the possibilities to buy standard systems on the market and to access equivalent services via outsourcing. Hence there is potential for competitive advantage with the potential for sustainable competitive advantage being restricted. Table IV sums up the

contribution of the three IT resources surveyed to competitive advantage.

TABLE IV
IT RESOURCES CONTRIBUTION TO COMPETITIVE ADVANTAGE

	Value	Rareness	Inimitability	Non Substitutability
Front-end	+	-	-	+
Middleware	+	O	O	+
Back-end	+	+	+	O

+ criterion fulfilled, O criterion partly fulfilled, - criterion not fulfilled

VI. CONCLUSION

This paper has presented research in progress concerning the contribution of IT to competitive advantage in an industry dominated by technology. The entire business model of the direct brokerage industry rests on the facilitation of IT for product and service offerings that are exclusively distributed over electronic distribution channels. This benefits both customers and broker firms, as IT facilitates speed of transaction, accessibility and a cost advantage that is passed on from bank to customer to a large extent.

Resting on the foundation of the resource based view of strategy, a model for IT and other resources to yield competitive advantage has been formulated. A review of literature concerning IT and competitive advantage leads to the conclusion that IT per se is often a strategic necessity rather than source of competitive advantage. IT related capabilities that combine IT with business and human resources may rather be a source of competitive advantage.

Turning to the banking industry more specifically another review of studies suggests that a close fit of IT and strategy has the potential for competitive advantage in banking. Although this finding is restricted to one strategy type and the conclusion, whether it yields competitive advantage or should be seen as strategic necessity is not revealed in detail. Further IT related innovations on the distribution and product side – hence what can be mainly attributed to the front-end applications identified in the direct brokerage industry – seem to be less likely a source of competitive advantage than a lasting innovative capability over time – in the fashion of a dynamic capability.

Given these sobering findings regarding the strategic value of IT per se we turned to a discussion of IT within the direct brokerage industry. A broad classification into front-end, middleware and back-end applications led to the conclusion that *front-end applications* can hardly be the source of competitive advantage, nor do *middleware systems*, given that they are readily available from software vendors have the potential to add strategic value.

The highest diversity of systems lies on the *back-end side*. Here most problems in scalability to keep track with rapid customer growth are experienced. Given that most companies rely on the mother bank's access to clearing systems and proprietary systems that migrated to real-time processing these grown systems reliability and scalability may contribute to competitive advantage. It is doubtful though, that these advantages are sustainable, given the pace of the industry and the activities of software companies to provide modular and flexible vendor solutions. So we see

potential for competitive advantage arising from back-end side systems that is temporal in nature and may be offset by the availability of standard software and outsourcing facilities, when these become more readily available in the future. This development would turn back-end systems into a commodity and hence a strategic necessity.

Note that some outsourcing opportunities are already being offered in the market. So has the Advance Bank outsourced its securities settlement to Hamburger Landesbank. The agreement works poorly, though, as Hamburger Landesbank is quite frequently at odds with the standards set out in the service level agreement and thus has to pay contractual penalties to Advance Bank. In the end this might put Advance Bank at a strategic disadvantage, as customers are dissatisfied with the service outcome. Hence it seems important that the provider of outsourcing services is able to deliver at last the same quality and cost efficiency internal back-office systems were able to deliver before. The same holds for the services provided by standard software. Current efforts by big private banks, such as Deutsche Bank or HypoVereinsbank, to provide by back-office services to other banks lead us to believe that the quality and cost efficiency of outsourcing opportunities will increase in the future.

Our preliminary results may be used to derive some *managerial implications*. IT-Managers in the brokerage industry should critically evaluate standardized software applications and outsourcing opportunities. Where these are readily available on the market it is often unlikely that home made solutions perform better in terms of quality and cost efficiency. This holds, as a single direct broker usually does not have the same staff, experience and investment volume for IT development like a software company, neither can a single bank realize the same scale, e.g. in settlement services, like a specialized outsourcing provider. Hence it is hard to derive competitive advantage. This is especially true for front end applications.

Where standardized software and outsourcing services are not available or they do not perform sufficiently, like in the example stated above, managers should concentrate on building up in-house capabilities for the implementation of the services in question to gain competitive advantage. This result is true until standard software and outsourcing facilities perform at least at the same level in terms of quality and cost efficiency.

There are some limitations in this research in progress that have to be addressed in *future research*. Firstly, as pointed out before, our findings will have to be validated by more in depth case studies or empirical surveys with a larger sample, incorporating the more advanced American direct brokers. Secondly we did not account for IT-related capabilities, such as combinations of IT applications with human and business resources [42], nor did we account for dynamic capabilities, e.g. for IT-related innovation [43]. The latter may be of outstanding importance to the direct brokerage industry.

The findings clearly are hypotheses. Further research is needed regarding the potential of information technology to yield competitive advantage in this heavily IT-driven industry.

REFERENCES

- [1] E. Penrose, *The theory of the growth of the firm*, Oxford 1959.
- [2] B. Wernerfelt, "A resource-based view of the firm," in *Strategic Management Journal*, vol. 5, pp. 171 – 180, 1984.
- [3] J. Barney, "Firm resources and sustained competitive advantage," in *Journal of Management*, vol. 17, pp. 99 – 120, 1991.
- [4] D.J. Collis, "Research note: How valuable are organizational capabilities?" in *Strategic Management Journal*, vol. 15, pp. 143 – 152, 1994.
- [5] R.M. Grant, "The resource-based theory of competitive advantage," in *California Management Review*, pp. 114 – 135, Spring 1991
- [6] R. Amit and P.J.H. Schoemaker, "Strategic assets and organizational rent," in *Strategic Management Journal*, vol. 14, pp. 33 – 46, 1993
- [7] D.J. Teece, G. Pisano and A. Shuen, "Dynamic capabilities and strategic management," in *Strategic Management Journal*, vol. 18, pp. 509 – 533, 1997.
- [8] Collis 1994 and Teece, Pisano and Shuen 1997.
- [9] As in Teece, Pisano and Shuen 1997.
- [10] Barney 1991.
- [11] M.A. Peteraf, "The cornerstones of competitive advantage: A resource-based view," in *Strategic Management Journal*, vol. 14, pp. 179 – 191, 1993.
- [12] R.P. Rumelt, "Towards a strategic theory of the firm," in *Competitive Strategic Management*, R.B. Lamb, Ed. Englewood Cliffs, N.J. 1984, pp. 557 – 570.
- [13] Barney 1991 and Peteraf 1993.
- [14] I. Dierickx and K. Cool, "Asset stock accumulation and sustainability of competitive advantage," in *Management Science*, vol. 35, pp. 1504 – 1511, 1989.
- [15] Barney 1991 and Peteraf 1993.
- [16] Dierickx and Cool 1989.
- [17] M. B. Liebermann and D.B. Montgomery, "First mover (dis)advantages: Retrospective and link with the resource-based view," in *Strategic Management Journal*, vol. 19, pp. 1111 – 1125, 1998.
- [18] Dierickx and Cool 1989
- [19] R. Reed and R.J. DeFillippi, "Causal ambiguity, barriers to imitation and sustainable competitive advantage," in *Academy of Management Review*, vol. 15, pp. 88 – 102, No. 1 1990.
- [20] Peteraf 1993 and I. Dierickx and K. Cool 1989.
- [21] Barney 1991.
- [22] E.K. Clemons, "Information Systems for sustainable competitive advantage," in *Information & Management*, vol. 11, pp. 131 – 136, 1986.
- [23] J.C. Henderson and N. Venkatraman, "Strategic alignment: Leveraging information technology for transforming organizations," in *IBM Systems Journal*, vol. 32, pp. 4 – 16, No. 1 1993.
- [24] J.F. Rockart and J.E. Short, "IT in the 1990s: Managing organizational interdependence," in *Sloan Management Review*, pp. 7 – 17, Winter 1989.
- [25] M.E. Porter and V.E. Millar, "How information gives you competitive advantage," in *Harvard Business Review*, vol. 65, pp. 149 - 160, July-August 1985.
- [26] S.W. Floyd and B. Wooldridge, "Path analysis of the relationship between competitive strategy, information technology, and financial performance," in *Journal of Management Information Systems*, vol. 7, pp. 47 – 64, 1 1990.
- [27] E.K. Clemons and M.C. Row, "Sustaining IT advantage: The role of structural differences," in *MIS Quarterly*, pp. 275 – 292, September 1991.
- [28] W.J. Kettinger, V. Grover, S. Guha and A.H. Segars, "Strategic information systems revisited: A study in sustainability and performance," in *MIS Quarterly*, pp. 31 – 58, March 1994.
- [29] C.P. Holland, B. Light and P. Kawalek, "Beyond enterprise resource planning: Innovative strategies for competitive advantage," in *Proceedings of the 7th European Conference on Information Systems*, J. Pries-Heje et al. Eds. Vol. 1, Copenhagen, 1999, pp.288 – 301.
- [30] T.C. Powell and A. Dent-Micallef, "Information technology as competitive advantage: The role of human, business, and technology resources," in *Strategic Management Journal*, vol. 18, pp. 375 – 405, 1997.
- [31] Barney 1991 and Powell and Dent-Micallef 1996.
- [32] J.W. Ross, C.M. Beath and D.L. Goodhue, "Develop long-term competitiveness through IT assets," in *Sloan Management Review*, pp. 31 – 42, Fall 1996.
- [33] Powell and Dent-Micallef 1996.
- [34] Barney 1991.
- [35] Powell and Dent-Micallef 1996.
- [36] Powell and Dent-Micallef 1996.
- [37] P. Geroski, S. Machin and J. Van Reenen, "The profitability of innovating firms," in *Rand Journal of Economics*, vol. 24, pp. 198 – 211, No.2 Summer 1993.
- [38] Floyd and Wooldridge 1990.
- [39] P.W. Roberts and R. Amit, "The dynamics of capability development: The case of Australian banking, 1981 – 1995," Unpublished Working Paper, presented at RESPECT Seminar, Copenhagen Business School, December 1998.
- [40] Floyd and Wooldridge 1990.
- [41] Roberts and Amit 1998.
- [42] Like in Powell and Dent-Micallef 1996.
- [43] Like in Roberts and Amit 1998.