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An attractive investment in the medium term

2002 is expected to see the video games industry growing strongly again thanks to an expanding installed base of new-generation consoles. The total number will be sufficiently large to offer content suppliers (game software publishers and developers) a strong market. E3, the world game fair, which took place in Los Angeles in mid-May, confirmed that the transition period is coming to an end. The announcement of the launch of Microsoft's X-Box and Nintendo's GameCube in the US in November 2001 combined with the presentation of quality products for all new consoles (including Sony's Playstation 2) marks the beginning of a much better newsflow. It is also a signal for the decline of the old console generation and a probably abrupt end to sales of Playstation (PSOne) games at the end of the year. This console now has the main installed base numbering over 88 million around the world.

The publication of 2000 earnings at the beginning of the year held back the sector. In the short term, this effect will be repeated with the publication of calendar H1 2001 results. Their impact on share prices is sure to be limited, however, since the falls in valuation suffered by companies in the sector since spring 2000 suggest that this factor has already been discounted. It is therefore tempting to anticipate recovery by reinvesting in video games publishers and developers in the short term.

The approach of E3 combined with some renewed interest in the video games software sector reversed the falling share price trend at the beginning of May. The trade fair admittedly helped confirm the recovery in the video game industry expected in 2002. Nothing concrete has emerged, however, to provide better visibility between now and then.

We believe that recovery will arrive earlier in the US than in Europe thanks to growing Playstation 2 sales and the launch of X-Box and GameCube. The US should as a result benefit from renewed consumer spending in the sector from the end of this year. World recovery is expected in 2002 with all new generation consoles present and introduced for the Christmas period.

The video games sector is thus attractive for the medium to long term, but not free from risk in the short term.

Recommendation summary

	Recommendation maintained	Initiating coverage
Buy	Phenomenia	CDV Software
Hold	Infogrames Ubi Soft Titus Interactive	Cryo Eidos
Sell		Kalisto Entertainment

Sector valuation

Recent share price performance

We have created a world video games price index comprising the following stocks:

Europe: Infogrames Entertainment, Ubi Soft Entertainment, Cryo, Cryonetworks, Gameloft, Titus Interactive, Kalisto Entertainment, Phenomedia, Gameplay, CDV Software and Eidos.

US: Electronic Arts, Acclaim, THQ, 3DO and Activision.

Japan: Bandai, Sega, Hudson Software, Koei, Namco, Cybird, Tose Company, Enix, Konami, Nintendo, Capcom and Square Entertainment.

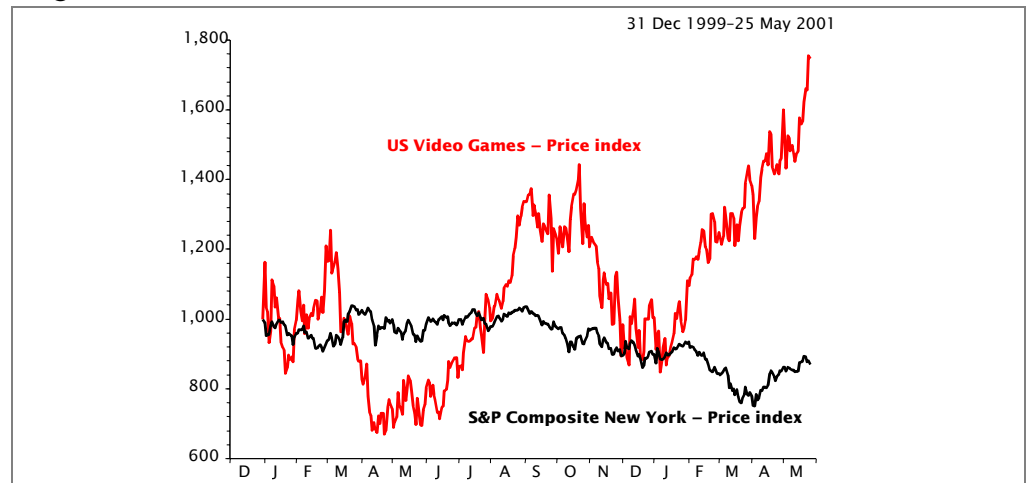
World video games sector index and MSCI World



Source: Datastream

The world video games index has been very volatile since the March 2000 correction. The games sector was as affected as new economy stocks. The recovery between July and November 2000 was due to the launch of Playstation 2 in Japan which had repercussions around the world. The shortage of PS2 and a wait and see attitude among consumers has led investors to react in the same way since the end of last year. This could be repeated with the launch of X-Box and GameCube at the end of 2001. It is the worldwide launch at the beginning of 2002 and therefore the availability of all new generation consoles in the main markets (US, Europe and Japan) which should trigger a lasting return to a rising trend.

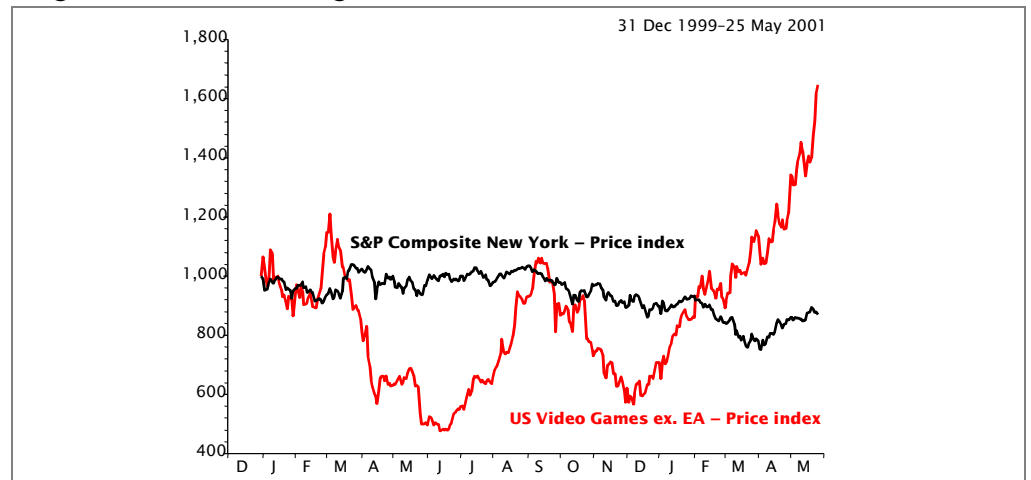
US games index and S&P 500



Source: Datastream

Investor action has been much more clearcut in the US. After having sharply punished the games sector, investors then bought in again in June 2000 before the PS2 launch. This turned out to be a little early and was corrected by companies publishing poor results.

US games index excluding Electronic Arts and S&P 500



Source: Datastream

If we remove Electronic Arts from our US video games index, it turns out to have underperformed the market. The substantial premium granted to the world leader relative to its American counterparts is distorting the US index.

The video games industry in the US has been recovering since the beginning of the year, helping it catch up with other sectors in anticipation of sector recovery at the end of the year in its domestic market.

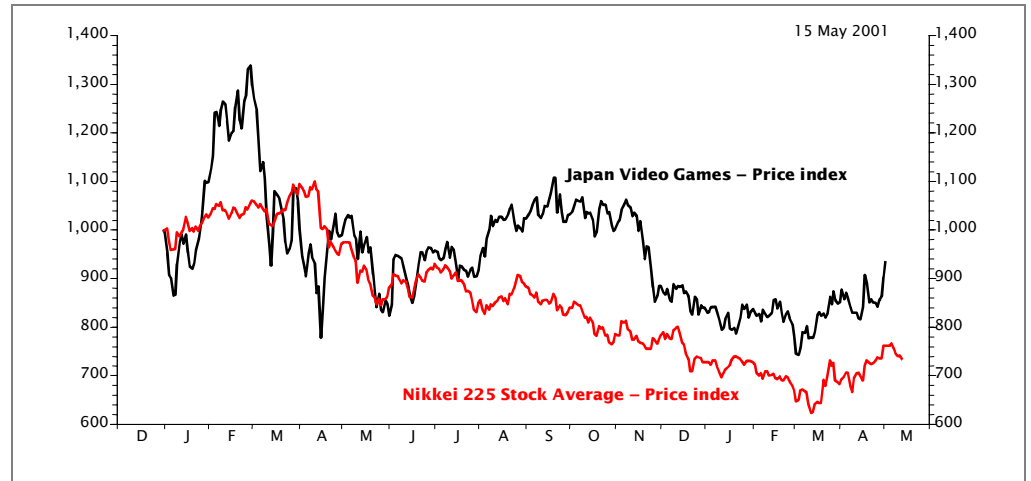
Europe games index and DJ Euro Stoxx 50



Source: Datastream

The European index is underperforming in the same way as the US index excluding Electronic Arts. The flow of profit warnings and other bad news (such as the price and shortage of PS2) plunged the sector into a downtrend. Since last April, the sector has enjoyed a bounce as a result of a generally more favourable trend but also in anticipation of good news flow from E3. We expect confirmation of the turn with the sector recovering in 2002 and better news flow both for consoles and game products.

Japan video games index and Nikkei 225



Source: Datastream

The advance launch of the PS2 in Japan in March 2000 explains why the video games index has performed well. Despite delivery problems, the index has benefited fully from the release of Sony's console. Japanese consumers have adopted much less of a wait and see attitude than in other countries. The fact that several console makers including Nintendo and Sony are Japanese has helped the index outperform. Recovery has therefore started in Japan.

Comparative valuations of video games companies

EV/sales multiples are most comparable since accounting standards for sales are similar at European and US companies. The average reveals a higher valuation for the US companies than their European counterparts mainly due to the premium commanded by Electronic Arts as world number one. Without Electronic Arts, multiples are comparable on the two continents.

In Europe three stocks, Infogrames, Ubi Soft and Cryo, stand out for their high multiples. The market prefers the two largest, Infogrames and Ubi Soft. Cryo's valuation does not look justified. The two German companies, Phenomedia and CDV, are trading on a substantial discount which may partly be the result of their small size. Sector recovery could cause these two stocks to catch up.

Calendar EV/sales multiples – European companies

	EV/sales 01	EV/sales 02	EV/sales 03
Infogrames	2.7	2.1	1.7
Cryo	2.5	1.9	1.6
Ubi Soft	2.6	1.9	1.5
Titus	1.4	1.2	0.9
Kalisto	4.0	2.9	2.0
Phenomedia	4.7	3.0	2.2
CDV	1.5	0.9	0.6
Eidos	2.3	1.7	1.3
Mean	2.7	2.0	1.5
Mean ex developers	2.2	1.6	1.3
Median	2.6	1.9	1.5
Median ex developers	2.4	1.8	1.4

Source: SG Cowen

Calendar EV/sales multiples – US companies

	EV/sales 01	EV/sales 02	EV/sales 03
Electronic Arts	5.7	4.2	3.0
THQ	2.5	2.1	1.7
3DO	1.3	1.1	1.0
Activision	1.8	1.4	1.2
Mean	2.8	2.2	1.7
Median	2.2	1.8	1.5

Source: Datastream, IBES

We have adjusted EBITDA for R&D spending in an attempt to neutralise differences in accounting standards. This multiple (EV/EBITDA before R&D) helps reveal how companies are managed without the influence of their main production cost. We see in particular that, even though Infogrames has reached critical mass and will be profitable during the next financial year, it is trading on the highest 2001 and 2002 multiples. We believe that the takeover of GT Interactive has led to substantial overhead costs. For this reason the company's multiples converge on Electronic Arts's in 2003 when Infogrames will start to achieve productivity gains affecting overheads.

EV/EBITDA before R&D multiples – European companies

	EV/EBITDA before R&D		
	2001	2002	2003
Infogrames	19.4	11.6	8.5
Cryo	8.8	6.2	4.7
Ubi Soft	8.3	6.1	5.1
Titus	4.7	11.2	4.2
Kalisto	nm	14.8	6.2
Phenimedia	8.5	5.5	3.9
CDV	4.3	2.6	1.6
Eidos	9.7	6.0	4.3
Mean	9.1	8.0	4.6
Mean ex developers	9.2	7.3	4.7
Median	8.5	6.2	4.5
Median ex developers	8.5	6.2	4.5

Source: SG Cowen

We have restated European companies' earnings to US GAAP standards to be able to compare them among themselves and with the US companies. This has meant charging R&D spending as costs rather than amortising it. These multiples reveal several features:

- Many European companies will not be profitable before 2003 or even later. This underlines the fact that only Infogrames, CDV, Phenimedia and Eidos will have reached critical mass by 2002. Infogrames continues to trade on a premium to other European companies but not relative to its main competitor, Electronic Arts.
- Cryo and Titus will not be profitable before 2003.

Calendar P/Es restated to US GAAP standards – European companies

	P/E US GAAP		
	2001	2002	2003
Infogrames	nm	43.8	28.8
Cryo	nm	nm	nm
Ubi Soft	nm	nm	31.3
Titus	nm	nm	8.8
Kalisto	nm	nm	22.1
Phenimedia	15.3	9.2	6.1
CDV	25.9	11.3	6.6
Eidos	nm	25.6	12.1
Mean	41.2	22.5	16.5
Mean ex. developers	nm	nm	17.5

Source: SG Cowen

P/Es – US companies

	P/E 01	P/E 02	P/E 03
Electronic Arts	234.8	41.1	27.7
THQ	31.4	23.5	18.9
3DO	nm	na	na
Activision	36.7	34.9	29.3
Mean	34.1	33.2	25.3
Median	34.1	34.9	27.7

Source: SG Cowen

Video games company valuations relative to entertainment companies

Entertainment company multiples

	EV/sales 01	EV/sales 02	EV/sales 03
Disney	3.3	3.1	2.8
Gaumont	4.5	4.2	na
Studio Canal	3.9	3.2	2.9
EMI	1.5	1.4	1.3
Median	3.3	3.1	2.0
Median US	2.16	1.77	1.46
Median Europe ex developers	2.53	1.89	1.49

Source: IBES, SG Cowen

Producing game software involves first and foremost supplying entertainment content in the same way as companies which produce cartoons, music or films. Comparing multiples of such companies as Disney, Gaumont, Studio Canal or EMI, which are much better established companies in a mature market, reveals that in terms of EV/sales, the game software sector is less highly valued than a traditional business. We believe that the interest shown in the sector could increase because of expected growth based on the new generation of consoles. Even though visibility is still lacking, this would make two things possible:

- Initially, re-rating the sector overall to discount the strong growth rates expected from 2002.
- As a second step, renewed interest in the sector combined with much more positive news flow, which started with E3, would help minimise the effect of profit warnings in the short term. These are still possible in the first half of calendar 2001.

As a result, all companies in the sector may aspire to a positive impact, led by those generating positive operating cash flow from 2002. This means Infogrames as well as the German companies CDV and Phenomedia which are trading on higher than average discounts.

Comparison between video games and entertainment companies is limited to the EV/sales multiple since operating margins at entertainment companies range between 15% and 20%, a level which the video games sector will find hard to achieve in the short term apart from Electronic Arts. Such comparison therefore has its limits.

Sector recommendations

Prospects are attractive in the medium term

Should the stocks be bought today? The answer is yes with a view to a minimum one-year investment. The current lack of visibility will gradually clear up. Growth prospects from 2002 are substantial for offline business while visibility will improve in the online business and regarding the potential for new platforms. The advent of new games platforms such as interactive television or mobile phones may in the long run limit the transition period from one generation of consoles to the next.

Video games sector to recover in the second half of 2001

E3, the main video games trade fair, took place in Los Angeles in mid-May and marked the start of recovery with a flood of better announcements than since the beginning of 2000. Microsoft announced it is to launch the X-Box on 8 November in the US and Nintendo will launch its GameCube three days earlier. Battle will therefore commence just before the Christmas holiday period in North America.

As a result, we can expect the sector to pick up again in the second half of 2001 and into 2002 when the Christmas season will help generate strong growth. There will be a new generation of consoles and the market will expand to become a more substantial mass market with ever more occasional players.

The second half of this year is expected to bring better visibility for PS2 sales, the rapid establishment of Gameboy Advance and the arrival at the end of the year of X-Box, a very promising competitor to the PS2. Microsoft has already signed more than 200 agreements with publishers and developers to supply games for the X-Box. The X-Box may start out with a handicap relative to the PS2, which will have the advantage of compatibility with the PSOne, experience and the brand, but transfers from PC to X-Box, which have similar technology, should help the X-Box benefit from a large number of high-quality games very quickly. Microsoft will also sell its console at a loss (estimated at US\$150 per console) and is offering royalty rates below those of its competitors, at least initially, to encourage the rapid build up of a base since time will be a key factor in the console war.

The video games market is currently estimated to be worth US\$20bn and is expected to double by 2003 according to Datamonitor.

After consoles?

The new generation of 128-bit consoles have an estimated life span of four to five years. Will we then see the same process again? We believe that platform diversification combined with a real mass market is likely to limit this kind of development. To develop new platforms requires companies to invest today if they are to be present tomorrow. The new platforms will take over from the game consoles that we know today and will make it possible to smooth consoles' technological transitions. It is to be hoped that set-top boxes will account for a significant proportion of the installed base, making it possible to access games (online or not, massively multiplayer or not).

The trend to concentration is set to continue

The process of consolidation slowed down in 2000 but is expected to pick up again this year with the advent of Microsoft likely to reinforce it. This is particularly true since Microsoft announced at E3 that it wants to supply one third of game software for consoles. Consolidation is already well advanced in the industry so the main players are now looking to acquire market share by buying high potential games catalogues (with or without licences).

Main acquisitions since 1999

Date	Acquirer	Target	Business	Country
1999	Ubi Soft	Groelier Interactive	Developer	UK
1999	Ubi Soft	Sinister Games	Developer	US
1999	Activision	Expert Software	Publisher	US
1999	Take Two	Toga Holdings BV (Pixel Studio)	Developer	US
1999	Infogrames	Accolade	Publisher	US
1999	Infogrames	Beam	Developer	Australia
1999	Mattel	TLC	Publisher	US
1999	THQ	PCP&L	Developer	US
1999	Titus	Interplay	Publisher	US
1999	Eidos	Pyro & Proein	Developer	UK
1999	Infogrames	GT Interactive	Publisher	US
1999	Infogrames	Gremlin	Publisher	UK
1999	Titus	Virgin Interactive	Publisher	UK
1999	THQ	Heavy Iron Studio	Developer	US
1999	Eidos	Ion Storm	Developer	
1999	Electronic Arts	Kesmai	Publisher	US
1999	Vivendi	Cendant software	Publisher	US
2000	Electronic Arts	Dreamworks Interactive	Developer	US
2000	Cryo	Homesoft	Distributor	Netherlands
2000	Cryo	Dreamcatcher	Publisher	Canada
2000	Havas Interactive	Prize Central	Gaming website	US
2000	Infogrames	DTI	Publisher	Canada
2000	Activision	NeverSoft Entertainment	Developer	US
2000	Infogrames	Paradigm	Developer	US
2000	Kalisto	Daylight	Developer	US
2000	Microsoft	Bungie Software	Developer	US
2000	Cryo	Modern Games	Distributor	Germany
2000	Ubi Soft	Red Storm	Developer	US
2000	Infogrames	Hasbro Interactive	Developer	US
2000	Ubi Soft	3D Planet	Distributor	Italy
2000	Cryo	TAC	Distributor	France
2000	Ubi Soft	Guillemot, distribution	Distributor	Germany
2001	Ubi Soft	Blue Byte	Distributor	Germany
2001	Ubi Soft	TLC, games division	Developer	US
2001	Ubi Soft	Guillemot, distribution	Distributor	Canada

Source: SG Cowen

This process is likely to be supported by acquisitions of content by network operators (for example, a telecom operator buying a software publisher or developer to get content) which would help re-establish a rising trend and better valuations in the sector. The two sectors both have to rebuild their valuations.

Company recommendations

Valuation criteria

Why is distribution still key in the industry?

Control of the distribution network is key in this industry since the goal of a software publisher is to occupy space on the shelves of both multiple and specialist stores. Competition is fierce, bearing in mind that each year more than 1,500 games are created. Control of the distribution network helps to get the best return on the investment in creating a game as well as protecting gross margin by not sharing it with distributors. The larger the distribution network, the larger the number of products needed for distribution to spread fixed costs. That is why publishers with an international distribution network distribute other companies' products. Pure distribution accounts for 7% to 15% of these publishers' turnover. Consumer habits vary enormously from one part of the world to another.

In the US, mail order is much more developed than in France where distribution through large stores is much more common than in Germany where there is a network of specialist retailers. The development of e-commerce will not call into question the method of distribution in its own right. For the internet to become a distribution channel, it has to win consumers' confidence, attracting them and commanding their loyalty by ensuring payment security and logistical follow through for orders. The problem of payment security is likely to disappear quickly once billing for content supply is made through TV, internet or telephone access providers. End customers will be billed for purchases and consumption along with subscriptions, paying by means of a telephone call or on delivery for example.

The gradual shift from a physical distribution network to a virtual one will call for good ability to react and rapid development of operating methods in companies' distribution business.

R&D is the key to production

Development costs include the resources for developing game software. It is investment in R&D that enables the developer or publisher to acquire the expertise needed to develop the tools that will enhance graphics, gameplay, intelligence, speed, character expression, effects such as rain, reflection of light on the body of a racing car and so on. With the new generation of consoles and the steady increase in PC power and display bandwidth, development costs are growing. Each console also has a development kit in which publishers and developers have to have expertise to create software. Technological developments lead to a race for developers to optimise platform capacity. For a company with critical mass, R&D costs amount to 10% to 20% of turnover. The problem of R&D cost control is crucial for small companies which have not reached critical mass. Competition is increasing by the day so development budgets are growing steadily. Two years ago, it was possible to develop a good quality product with a budget of EUR1m to EUR2m. Today, the budget is more likely to be EUR2m to EUR4m for new products (not developed for a previous platform) on a new generation console. A company which does not master the production process is set to fail.

Strong licence products

Games with a well-known name or high recall character have a strong presence. A product under licence has a dual impact: it generates extra costs for the licensee but it is the licensor which takes responsibility for the marketing budget. A strong licence will help generate greater volume effects than the same product

without a licence. The key point is therefore the acquirer's ability to assess the licence's potential and therefore its price. Licences often derive from the world of films, cartoons, comics or television. All publishers have a more or less aggressive licence acquisition policy.

Timely marketing

The cyclical nature of this industry is a major factor which publishers must take into account. The strongest season is November to March. This console product seasonality is much less pronounced for PC products because they have a larger and more stable installed base which is less subject to sudden technology leaps than to a steady change of power and display bandwidth. Many publishers have not yet managed to smooth this seasonality which increases product risk. The impact of a product's delay on company turnover is immediate.

Breakdown of turnover by platform

The breakdown by platform is crucial, particularly during a period of transition. It affects publishers' gross margins since PC games generate more than 70% gross margin compared with only about 45% for consoles because of the royalties paid by the publisher to the console maker. This difference, combined with a much sharper than expected slowdown in old generation console sales, means that publishers who concentrate on consoles without expanding to PCs face greater difficulties ahead of such a transition period. They are the ones most exposed to the process of concentration.

Geographic diversification

In a worldwide industry such as video games, companies have to operate in the main markets of the US, Germany, France and the UK. A direct presence makes it easier to adapt products to local demand, be in contact with market operators and generate a large volume effect. Japan is also a strategic market but very difficult to break into. The three main console makers are Japanese and the Japanese are inveterate players but have quite different tastes from those in Europe or the US. A publisher has to have a presence in Japan if only in order to keep an eye on the latest technological advances.

Risks

Supply

The problem of product shortages or oversupply has particularly big consequences if the support is a console. It costs less than EUR1.5 to make a CD-ROM for a PC whereas a CD-ROM for Playstation or Dreamcast costs about EUR12.2. Lead time is four weeks compared with a maximum of one week for a PC CD-ROM. It is partly because of the cost and lead time for a cartridge that the N64 was supplanted by Playstation which was only 32-bit. The price of the Gameboy Advance cartridge is higher than for the Gameboy Colour and therefore reduces publishers' margins.

Piracy

Piracy is becoming ever more widespread both on PCs and consoles. It is hard to measure the impact but it is easy to imagine that when a game is launched hard core gamers will be the first to know about it if it can be downloaded from a web site. The game will then quickly be burned onto a CD and sold for a few euros. Several companies are trying to protect their products by using encryption keys, but without much success.

Selling prices for PSOne (Playstation) products are falling

Sony hoped to extend the life of the PSOne platform's installed base by making the level of royalties flexible at the beginning of 2000. This new strategy prompted publishers to shift much more quickly from a full price to a budget price product. If this strategy is not applied uniformly on all platforms, market growth may be severely disrupted but the trend today is towards stopping buying PSOne products in order to switch to new generation consoles.

Wage pressures

The industry has so far succeeded in keeping wages moderate, particularly in Europe. Games attract fans who thirst for creativity so employees responsible for producing game software accept low salaries. Pressure was tending to build in 1999 and at the beginning of 2000 but has relaxed again with the slowdown in the US economy and the transition in the games market. We do not anticipate any pressure on the main cost item in this industry.

Lack of short-term visibility

The lack of short-term visibility in the sector makes forecasts uncertain. The volatility experienced by the industry since last year makes valuations difficult and less precise.

Dematerialisation of the medium

The medium is set to become 'dematerialised' in the long run as content is digital. This will bring a dramatic transformation in the industry, as is being experienced by the music industry today. The future is therefore online with all its known risks relating to intellectual property, the legal blur regarding transactions and piracy.

Bankruptcy risk

The risk of bankruptcy hangs over companies which do not have sufficient cash since external financing is much more difficult to find because of market conditions. In the long term, the convertible bonds outstanding for most companies may present a risk since some companies are not currently in a position to redeem them if they are not converted.

In conclusion, investors should favour companies possessing a diversified catalogue that includes strong licences offering hit potential. The diversification of products by platform is another major factor of success in the transition, limiting dependence on console makers.

Recommendation summary

	Recommendation maintained	Initiating coverage
Buy	Phenomedia	CDV Software
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Sell		Kalisto Entertainment

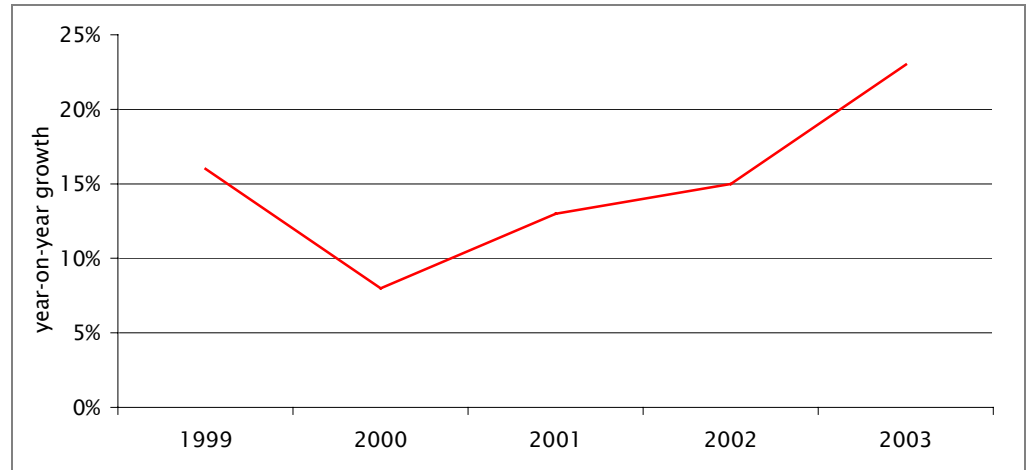
The offline market

Key figures

The software industry is 30 years old. Young, dynamic, high potential and undergoing consolidations - the industry can be described in many ways. Technological progress has been staggering since the first Pong game in 1972. From the first products for hard-core gamers, offerings have now moved to the mainstream and the number of games players is constantly increasing.

In 2000 the total market (consoles plus software) was worth US\$20bn, about 60% of which was software sales. This figure is expected to double by 2003 according to Datamonitor as a new generation of consoles is introduced.

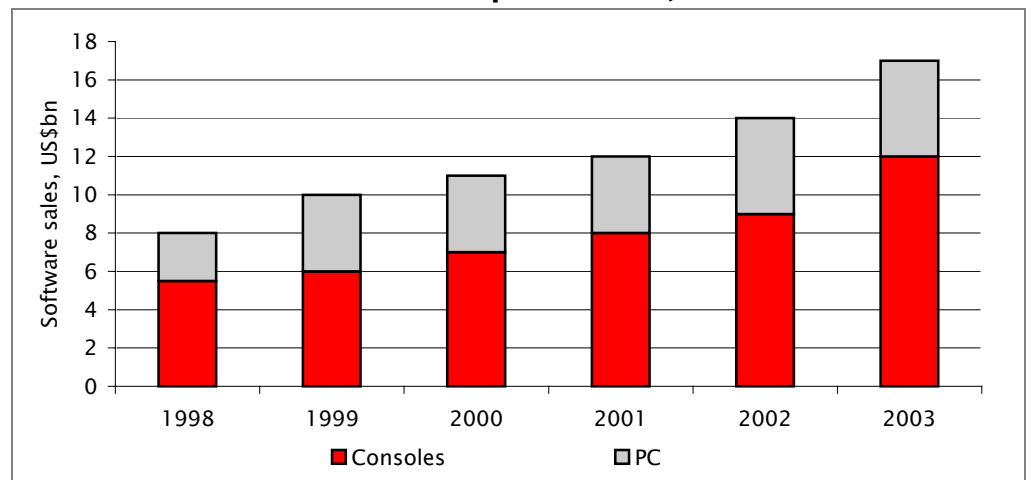
Offline games growth rate in Europe and the US



Source: IDC

Games software sales trends in the US and Europe show console games dominating PC games in the long term.

Total software sales in western Europe and the US, 1998-2003



Source: IDC

Sharp slowdown in demand in 2000

First half 2000 saw a sharp slowdown in sales of games for Playstation due to a shortage of PS2. It was sales of PC games that supported the market. PC game software is by definition not subject to sudden technological leaps as developers are obliged to design games with reference to a very diverse installed base. The kind of customer - older - also leads to lower sales cyclicity on PCs than on consoles.

Playstation's repositioning as PSOne (same technology but one third smaller) is an attempt to extend the life of the world installed base of more than 88 million units. Sony has confirmed that game sales are holding up well for this old console, but has not given any figures. We are cautious about the PSOne's potential. This repackaging together with a cut in game prices has generated a substantial volume effect, particularly on sales last Christmas. The effect has not however offset the loss by value. We believe that this console is at the end of its life and is likely to have virtually disappeared in sales terms by end 2002.

According to NPD, total sales in the US market (consoles + software + accessories) fell in 2000. It was PC products that supported the market.

US sales in 2000

	US\$bn	% change vs 1999 (%)
Total market (consoles + accessories + software)	6.5	-5.8
- Total consoles	1.4	-21
- Console software	4.1	-2.6
PC software	1.6	+7

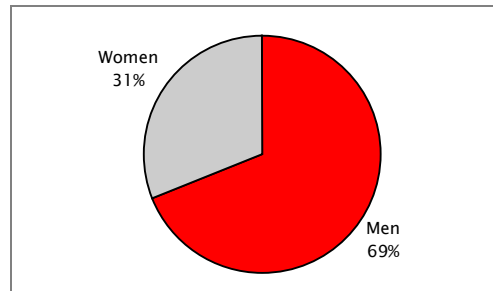
Source: NPD

Diversification of demand

Since the mid-1990s the industry has experienced new trends reflected mainly in the following:

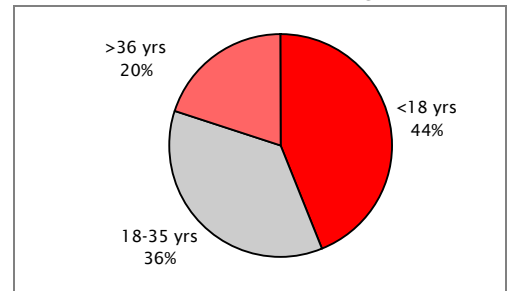
- A changing consumer profile. The average age has increased considerably and is now 29, although the standard deviation is quite substantial. This observation has led to product ranges being extended. The desire to aim at a broader target market (from 5 to 60 years) implies segmentation and specialisation of products by age range (this kind of leisure activity is not the same for a child of 5, an adolescent or an active person with a family). Adults with increasing knowledge of technology are pushing platform makers to build in the latest technology wave and to advertise the fact. The result is a console cycle which gives birth to a new generation every four to five years.

Breakdown of players by sex



Source: IDC

Breakdown of players by age



Source: IDC

This awareness of technology helps affect product quality:

- Improved software maximising machine capabilities (graphics, gameplay, fluidity, image quality, speed of response). This is checked on consoles but not necessarily on PCs as a result of the diversity of the installed base.
- Increasing device storage capacity. Information storage capacity is essential for software. For the current generation, the support is the CD-ROM which can hold up to 650 MB (it is possible to increase capacity up to 300 times by compressing data). Apart from the Dreamcast which opted for a GD-ROM (with one gigabyte capacity), the new generation of consoles uses DVD-ROMs with a capacity of about 9 gigabytes. DVD-ROMs therefore have easily enough capacity to absorb the growing complexity of game software which currently only require between 1 and 2 GB.

Diversification of offerings

Games offerings are becoming more diverse. There are seven major categories.

Breakdown of game software sales in the US (% by volume in 1998)

Action	44%
Sports	20%
Adventure/role-playing	13%
Strategy	10%
Flight simulation	5%
Puzzles	3%
Other simulations	1%
Other	4%

Source: NDP

Action games (with shooters) and sports (particularly racing) dominate the list and themselves include several subcategories. In action games for instance, which account for the largest percentage of products sold, there are action/role-playing games such as *Diablo* (Blizzard) and adventure action games such as *Tomb Raider* (Eidos). Supply is diversifying because it is no longer aimed solely at hard core gamers but at a market which is tending to become a mass market since the target age range is no longer just 15 to 25 but 5 to 60. Players are increasingly women while US and European products are not hits in Japan and vice versa (except for a few exceptions such as *Final Fantasy*, a product developed by Square, one of the biggest Japanese development studios).

The transition that has started is also affecting content with the appearance of games (quiz or casino) aimed at much more occasional players such as *Who wants to be a millionaire?* published by Eidos. Online casinos are enjoying great success in the US and the success of *Winamax* on TF1's site is just as convincing. The transition to a mass market is therefore continuing with the consumer profile tending to expand towards more occasional and older players. Content will therefore change to respond to evolving and diversifying consumer profiles.

Platform development

Household penetration rates 1998

	US	France	Germany	Italy	Spain	UK
Consoles	38%	26%	10%	12%	35%	18%
PCs	43%	20%	30%	15%	18%	17%

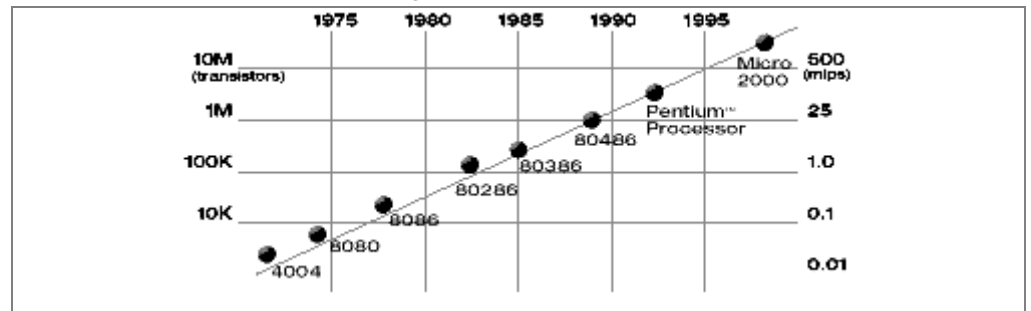
Source: EITO, GFK

PCs

PCs have become a mass-market product. The increase in PC power has made it possible to develop ever more complex and attractive games software. The installed base is, however, not uniform and developers are obliged to bear this in mind so that their products can be accessible to as many customers as possible.

According to Moore's Law, PC processing power doubles every 18 months.

Growth in processor computing power



Source: Intel

Old generation consoles

Consoles have overtaken PCs and the trend is accelerating. Whereas the breakdown of the installed base of game platforms was balanced between PCs and consoles in 1996, IDC predicts a 70/30 breakdown in favour of consoles in 2003.

The console platform is strongly supported by Nintendo and Sony (and, from 2001, by Microsoft) not because of the profitability of the product itself but because of the royalties that software publishers have to pay per product sold, about 20% to 30% of the development cost. In 1998 there were more than 100 million consoles around the world. At the end of March 2001 Sony announced that it had sold more than 88 million Playstations (PSX or PSOne).

A history of platforms

Company	Power	Platform name	US launch
Sega	16-bit	Genesis	1989
Nintendo	16-bit	SNES	1991
Matsushita	32-bit	3DO Interactive Multiplayer	1993
Sega	32-bit	Saturn	1995
Sony	32-bit	Playstation	1995
Nintendo	64-bit	Nintendo N64	1996
Sega	128-bit	Dreamcast	1999
Sony	128-bit	Playstation 2	2000
Nintendo	128-bit	GameCube	2001
Microsoft	128-bit	X-Box	2001

Source: SG Cowen

New consoles promise a difficult transition

The golden age of the 32/64-bit generation is only a distant memory for video game companies. The consequences of the technological leap from one generation of consoles to the next were poorly understood so the transition continues today with some companies consolidating and repositioning. This is true of Sega which was yesterday's sector leader but announced in mid-January that it had signed an agreement with Sony to develop games for Playstation 2 (PS2). Sega has stopped producing the Dreamcast and started to develop games for its former competitors.

The new generation of consoles is more powerful in terms of display and reaction time. Two of them include a DVD reader and in the long run internet access. The X-Box and the PS2 are positioned as living room multimedia platforms and the GameCube as a console for a child's bedroom.

The table below summarises the various technological features of the new 128-bit generation of consoles.

Main features of 128-bit consoles

Model Maker	Dreamcast Sega	PS2 Sony	GameCube Nintendo	X-Box Microsoft
Date on market	24 October 1999 Production stopped end 2001	Nov 1998 in Japan, Oct 2000 in US, Nov 2000 in Europe	Sep 2001 in Japan, Nov 2001 in US, early 2002 in Europe	Nov 2001 in US, early 2002 in Japan and Europe
Main processor	Hitachi SH4 RISC	Mips Emotion Engine	IBM Power PC Gekko	Intel Pentium III
Clock speed	200 MHz	300 MHz	405 MHz	733 MHz
Main memory	16 MB	38 MB	43 MB	64 MB
Graphics processor	NEC Power VR2	Sony GS	ATI Flipper	Microsoft / nVidia
Graphics clock speed		150 MHz	202.5 MHz	250 MHz
Graphics memory	8 MB	4 MB	3 MB	64 MB
Resolution	680 x 480	1280 x 1024	Unknown. Compatible with HD TV image	1920 x 1080
Number of polygons per second	3 million	66 million	6 to 12 million	125 million
DVD reader	No	Yes	No	Yes
Sound	Stereo 64 channels	Stereo 48 channels (inc Dolby Digital and DTS)	Stereo 64 channels	Unknown
Memory bus bandwidth	800 MBps	3.2 GBps	3.2 GBps	6.4 GBps
Media format	CD-ROM (1.2 GB)	CD-ROM (660 MB) or DVD-ROM (4.7 GB)	DVD-ROM 8 cm diameter (approx 1.5 GB)	DVD-ROM
Paddle ports	4	2	4	4
Storage memory	VM 128 KB, 2 per paddle	Two 8 MB plug-in cards. From 2001, accessory for broadband access and hard disk installation	Ultimately, Digicard 64 MB memory card	Memory card comparable to Sega VM. 8 GB hard disk
Modem	56 Kbps	56 Kbps or 100 Kbps as option	56 Kbps or 100 Kbps as option	Internet compatibility announced
Size in mm	185 (L) x 185 (W) x 57 (H)	176 (L) x 300 (W) x 66 (H)	161 (L) x 150 (W) x 110 (H)	na
Approximate weight	1.6 kg	2.5 kg	na	na

Source: Company data

X-Box's superior power compared with the PS2 can be seen in the number of polygons displayed per second, greater image resolution and the hard disk which the X-Box will have to store data. Will this superior technological power make the grade compared with the Playstation brand reputation established by Sony over the last few years? As a new entrant, Microsoft starts out with a handicap compared with Sony particularly since it disappointed developers and publishers at E3. The PS2 will already have sold some 20 million units around the world by the time the X-Box is launched in the US in November, reducing visibility for the latter.

Offline games for new generation consoles will all include a multiplayer function. The antecedents of this function lie in the Multi User Dungeon (MUD), born 25 years ago. The function only became widespread however in 1993 with Doom (up to four machines on a network). It now allows several dozen people to play on a network at the same time via the internet or on a console which can accommodate several paddles. The function combines with internet capability to make it possible for a theoretically limitless number of people to play at the same time, adding a new dimension to interactive games. The player no longer plays against the machine's artificial intelligence but against human intelligence. That is what attracts a lot of gamers.

The game trade fair in Los Angeles provided much quite positive information:

- More and higher quality PS2 games to be brought for the year end.
- X-Box (Microsoft) and GameCube (Nintendo) to be launched in November in North America. The shortage experienced by Sony when it launched the PS2 at Christmas 2000 will be repeated with these two new generation consoles since the makers expect to sell between 1 and 1.5 million each.
- Sega's role as a significant publisher.
- The decline of the Playstation might be more abrupt and faster than currently anticipated.

The leading console in 2001 will therefore be PS2. Sales reached 10 million units by end March but Sony had brought down its forecast to that date to 9 million by the end of last year. By region, the installed base shows Japan in the lead with 4.65 million units followed by the US with 2.76 million and Europe with 2.63 million. Sales of 20 to 25 million PS2s are expected by the end of 2001. Comparison with the PSX launch shows the PS2's penetration rate has been three times faster. The creation of a real games catalogue (100 are expected to be available for Christmas 2001 in Europe and 183 have already been released to date in Japan) should help accelerate this roll-out.

Microsoft does not expect to win with the power of its console, but rather with the content. All main publishers and developers have announced that they are working on the X-Box. On 8 November 800,000 X-Boxes will be available in the US at US\$299 with 15 to 20 games, 50% of which will be exclusive (Sony sold more than a million PS2s on launch day in Japan). The ease of developing games for the X-Box compared with the PS2 is an advantage and the first games for X-Box shown by publishers at E3 look very high quality. X-Box games will be the same in all countries (the world will not be broken into zones). They will not suffer from the current constraints of existing consoles, namely that they are incompatible from one geographic zone to the next (NTSC in the US and Japan, PAL in Europe and the rest of the world). Development studios will however be free to include a zone code in their titles if they wish. To offset Microsoft's advantage (including the fact that the console has a hard disk) on future online products, Sony announced in mid-May that it had signed two major accords with heavyweight operators AOL

for internet access and Realnetworks for software making it possible to broadcast music and video over the internet.

The price difference between the two competing consoles in Europe will probably push Sony into cutting the price of the PS2.

Sony's PS2 sales target is 120 million machines. Microsoft's target is 100 million X-Boxes. We believe that these two targets are incompatible. However it turns out, the development of several consoles will help publishers and developers diversify their catalogues by platform and as a result limit their dependence on a single platform.

Nintendo's GameCube was the revelation at E3 this year, offering quality products and, at US\$199, a lower launch price than its competitors. Launches in Japan and the US are planned for the beginning of September and beginning of November respectively. Nintendo expects to sell 2.5 million units and will provide some 15 games.

The portable console market is a virtual Nintendo monopoly through Gameboy Colour and Gameboy Advance. The latter was brought out last March in Japan and April in the US and will be available in Europe in June. The bulk of Nintendo's games catalogue is for this platform but publishers only generate a limited proportion of their turnover on this very lucrative support for which development costs are very low (less than EUR0.3m per game). Competition is virtually non-existent this year but could emerge over the next two years since Bandai is launching a competing portable console. Nintendo's monopoly will be hard to break however given the quality of the Gameboy Advance and the Pokemon phenomenon.

The market is also attracting new entrants. Matsushita, which supplies CD and DVD readers to Nintendo, announced at E3 that it will launch a new console using GameCube games. This will be a game platform, an audio CD reader and a DVD reader at the same time. It will be available at year end.

Worldwide installed base				
Million units	2001	2002	2003	2004
PS1	80	70	50	25
X-Box	1	9	22	37
PS2	25	47	78	109
GameCube	2.5	10	25	40
Total	108.5	136	175	211
Total new generation consoles	28.5	66	125	186
Total growth		26%	29%	21%
New generation growth		136%	89%	49%

Source: SG Cowen estimates

Companies and their business models

Video game company profiles

Developer

Refers to the company that actually creates the game versus the company that publishes it (duplicating disks, printing boxes, working out distribution etc.). The developer is often given a brief initial specification sheet by the publisher.

Development Studio

A developer wholly owned by a publisher, which operates at least semi-autonomously. An example would be Origin, which is wholly owned by Electronic Arts, but which operates largely as an entity in its own right.

As well as major publishers there are a multitude of more or less independent development studios which are the real creative crucible for large publishers looking for a hit or for products to distribute. For most publishers 30% to 50% of their development also goes through external studios.

Distributor

A company that handles allocation of software packages to retail outlets. Many companies act as their own distributors while many choose to employ a third party.

Publisher

A company which actually physically produces disks, boxes, and manuals, and handles getting software boxes into stores as well as marketing and advertising. Publishers may develop their own games or they may contract all their games out to independent developers, or they may do some of both.

Key features of the offline business model

Development and marketing costs

Developing a game now takes 18 to 24 months for a console game (and 12 months for a PC game) compared with 12 to 18 months a year ago. This production lead time will continue to increase as machines become more complex. The game software production process has to be split into several stages in order to understand it.

- **Game selection.** This is based on market potential. At each stage of the production process, the publisher has to be able to estimate not only the product's sales potential but also development quality and viability.
- **Software production.** A key factor in this industry is control of production lead times. A project manager is appointed for each piece of software. He is responsible for concluding the production process on time. Time is important since, if the game is not delivered within the planned schedule, the publisher may cancel his order. Exceeding initial schedules can lead to a delay in the product being brought out. Given the high level of seasonality in the industry, a product will not sell the same number of copies if it is brought out two months after Christmas rather than for Christmas. That is what happened to Titus's *Superman* title in 1999 or, more recently, to four Eidos products which failed to arrive in time for Christmas. This forced Eidos to revise down its forecasts for 2000. The thinner the company's games catalogue, the greater the risk.

Development costs will initially be higher on the PS2 and GameCube because of the learning period on these new platforms. Part of the tools developed for

Dreamcast should be re-usable for PS2 developments, limiting the learning period. The effect should be smaller for X-Box since it is much more similar to PC technology and therefore access is easy. In the same way as happened at the launch of the 64-bit generation, games for PS2 and GameCube will first be developed by the sector majors which can bear large development costs. When the technology has become more commonplace, they will start to outsource production for these platforms.

This model also holds true for all new products. The budget is smaller however in three cases:

- For a follow on. Development teams can capitalise on already known and used tools and marketing teams can use the brand name.
- For a second product. The development budget will be determined as a function of the product's estimated sales potential.
- For the migration from one platform to another. Often from PCs to consoles where some development work can be re-used.

■ **Marketing.** This factor is crucial, particularly when the product uses a licence (known characters, names, universe) to such an extent that the marketing budget may be larger than the development budget. Marketing costs have increased substantially at all publishers over the last ten years. The marketing budget for *Tomb Raider III* for instance was £10m compared with £5m for *Tomb Raider II*.

Costs are rising rapidly and companies are looking to develop hits in order to generate volume. On top of development costs, publishers have added to their marketing budgets for high potential products. Some publishers and developers base all or part of their strategy on products developed under licence, as is the case for Titus, Ubi Soft, Acclaim, Infogrames and Electronic Arts. Producing games under licence has one major disadvantage which is that it sharply increases costs as a result of acquiring operating rights. It does however also offer not inconsiderable advantages. A game based on a strong licence will have no trouble being distributed and it is the licensors, not the licensees, who are responsible for advertising and marketing costs. A game under licence has much more chance of becoming a hit.

When a game is created, the risk is taken by the publisher and not the developer. The developer is paid in the form of advances on royalties (which are not reimbursable), but the publisher assumes responsibility for the product launch and, in most cases, distribution in the main markets.

■ **Distribution.** This is the key to the industry since it gives direct access to store shelves, the limited number of which creates increased competition. Margins in this business may be low but a global publisher with a worldwide presence has to have a direct distribution network at least in the main markets to ensure it can meet volume targets. Distribution includes managing large stocks and, if the product does not sell as well as expected, potentially substantial surplus stock. On the other hand, if the publisher does not have sufficient stock he will miss sales, particularly given production lead times and the product's life expectancy (no longer than six months except for strategy games for example).

Pricing policy

At the same time as highly seasonal prestige products, a market is developing for less expensive products at the end of their life or products which are simpler to develop and whose life can therefore be extended, smoothing seasonality. By way of example, bundling through OEM agreements helps extend a product life cycle. Margins are much lower but the publisher generates larger sales volume. This practice is widely used in the US.

This trend in demand points to segmentation of sales by price on top of segmentation by type of product. Games at US\$9.99 already help publishers generate substantial sales volumes. Despite everything, this strategy is still under the control of console makers who set the level of royalties paid by publishers for developing games on their consoles.

Since April 2000 the PSOne has been an exception as Sony has agreed to alter its royalties according to the selling price to protect the installed base and allow publishers to continue developing games for this platform. Sony plans to apply the same flexible approach to the PS2 when the product is mature.

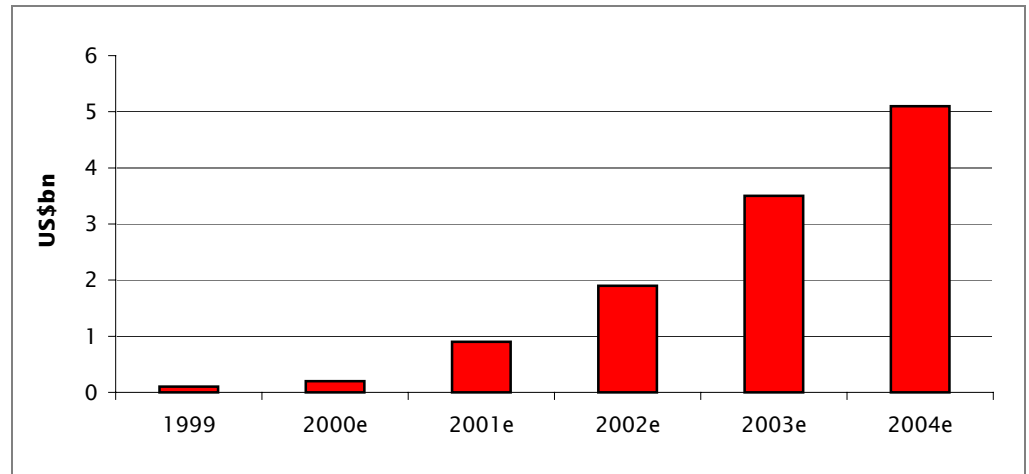
Online gaming: a revolution and a new platform

Potential is hard to estimate

Online game playing has given birth to a new platform which makes it possible to combine a new distribution channel and a new game support. Companies in this sector are still at the stage of testing a business model but the market looks promising. According to various reports, games are the main reason for internet users to surf, second only to adult sites.

Estimates by Datamonitor in 2000 suggest an average growth rate of 127% per year for the online games market from 1999 to 2004, taking it to US\$5bn.

Online games market, 1999-2004



Source Datamonitor

Online games market in US and Europe

US\$m	1999	2000e	2001e	2002e	2003e	2004e
US	57.5	160.8	540.6	1,077.5	1,999.1	2,806.2
UK	6.1	21.5	85.3	181.8	348.1	518.8
France	2.3	10.9	49.4	120.2	236.1	360.5
Germany	8.4	28	103	230.6	435.7	645.4
Italy	3.8	15.1	54.1	114.1	197.5	277.6
Spain	1.9	7.2	32	78.5	160.5	244.1
Sweden	1.7	4.6	14.9	30.2	55.4	79.9
Total Europe	24.2	87.3	338.7	755.4	1,433.3	2,126.3
Total US + Europe	81.7	248.1	879.3	1,832.9	3,432.4	4,932.5
Growth %		203.7%	254.4%	108.4%	87.3%	43.7%

Source: Datamonitor

Dataquest has however just cut in half its estimate of US\$5bn in 2004.

Only limited figures are available for the internet games industry and the gap between forecasts shows how hard it is to estimate the market's value and define what an online player is. Datamonitor estimates world revenue in this market (subscriptions plus advertising) were worth US\$250m in 2000 while DFC estimates it at US\$900m in 2001 and Jupiter Communications US\$800m in 2002.

Online games are still only at the toddler stage but Electronic Arts, the world leader, plans to generate 20% of turnover on this platform by 2003. 2000 revealed the various companies' strategies in the sector. Cryo already has five online games among its assets, accounting for about 7% of 2000 turnover. Kalisto presented its internet strategy at the beginning of February and its first online game will be available next year through France Telecom's portal for young people, Goa.com (set up in May 1999) and is already building multiplayer functionality into all its new products. Infogrames has created a subsidiary to bring together all online businesses including internet, interactive TV and WAP.

From hard-core gamer to casual gamer

There are two types of game players: casual gamers (occasional players) and hard core gamers (in other words, fanatics). The hard-core gamer remains connected or hooked up to his universe constantly (he plays an average of three to four hours per day), on the look out for the latest new development and tips. These hard core gamers are for the time being the core target for online sites since they are the ones who stay connected for the longest time. They do however present a problem for sites wishing to extend their customer bases since they form their own community, sometimes closed in on itself, which does not encourage the entry of new players. The difference between these two profiles is likely to lead to content being adapted.

Hard-core/casual gamers in the online market (millions of players)

	1999	2000e	2001e	2002e	2003e	2004e
Hard core	2.06	2.68	5.44	9.56	16.8	20.47
Casual	6.29	10.01	15.44	23.38	30.07	52.55
Total	8.35	12.69	20.88	32.94	46.87	73.02
Casual/total	75.3%	78.9%	73.9%	71.0%	64.2%	72.0%

Source: Datamonitor

Types of games offered

Massively multiplayer online games

Online games require high broadband capacity and modem speed. All data is transmitted in real time from the PC to the server. The greater the number of players connected simultaneously, the greater the bandwidth needed. It is for this reason that online games need the broadband capacity which fibre optic cable networks will be able to supply.

The main kind of massively multiplayer game available online is the RPG (role-playing game) such as *Ultima Online* developed by Electronic Arts or *EverQuest* developed by Sony. These games call for less serious reaction and data update time than would be needed for a car race game for example. It is therefore the shortage of adequate broadband network capacity which is currently limiting the development of massively multiplayer games. This kind of online game is for the time being aimed at a hard-core gamer population, but this is likely to change.

Network games

These are games found particularly in gaming zones. The number of players is limited to a maximum of a few dozen and it is not a persistent universe. Online access is therefore needed, but the game is in closed circuit.

Network games over the internet are in fact software hosted on a server. Access to this has to be bought and is most often sold on a CD-ROM. After a light installation allowing access, only data needed for the game to progress is exchanged between server and PC. This makes it possible to have games with more developed graphics which are closer in quality to offline games.

There are various internet access platforms apart from PCs.

Pervasive gaming (in millions of households)

	1999	2000	2001	2002	2003	2004	2005
PCs online	44.3	54.1	56.8	58.5	60.3	62.0	63.0
% of online PCs used for games		19%	25%	31%	35%	37%	38%
Total online-game-playing households		8.4	13.5	17.6	20.5	22.1	23.3
% of broadband-capable consoles that will hook up to broadband							
Number of broadband-capable consoles		0	14.5	30.7	44.5	58.5	68.5
% of broadband-capable consoles that will hook up to broadband		0.0%	65.0%	75.0%	80.0%	90.0%	100.0%
% of consoles connected to net		0.0%	19.3%	32.1%	45.4%	58.7%	63.5%
Adjusted percentage of connected consoles		0.0%	12.6%	24.1%	36.3%	52.8%	63.5%
Total connected consoles		0.0	1.8	7.4	16.2	30.9	43.5
% of set-top boxes with Licensed chip enhancement		0.0%	0.0%	2.0%	5.0%	10.0%	15.0%
Total enhanced set-top boxes		0.0	0.0	0.3	1.0	2.9	6.3
Total pervasive gaming platforms		0.0	1.8	7.6	17.1	33.8	49.8

Source: Forrester

In the long run, it is consoles that will be the platform of choice for online games in a persistent universe or for network games.

Flash games

The leading games are flash games. Their main aim is to attract internet users and keep them for as long as possible to win their loyalty and to attract new customers by word of mouth. These games are ordered by trading sites from developers for a relatively modest sum (EUR20,000 to EUR75,000). They are the subject of small contracts and often go to independent developers.

Online community games

Online games sites offers games of varying calibre to varying audiences. Free family games (such as wheel of fortune or card games) may for example exist side by side with games aimed at hard core gamers which must be paid for. The thinking is simple. Free games are loss leaders which cause internet users to connect again and again. Gradually, they may drift to the paying versions at quite affordable prices (less than US\$10 per month for *EverQuest*).

Business models

The business models depend on the technical solution applied.

Point to point

- **Mechanism.** One of the players hosts part of the game on his PC and the other players hook up to it. The PC is itself connected to a central server whose role is to identify players.
- **Advantage.** Constant development is made possible by the developer putting a toolbox at players' disposal, enabling them to create new worlds (called modules). The space is as a result very user-friendly since it is partly managed by the players who stay in small committees (the number of players on a single server generally does not exceed six). The game space managed in this way is more balanced since players can introduce a fully synchronous part according to the connection speeds of each player.
- **Disadvantage.** Generally, only a small number (6) can play at the same time.
- **Development.** This kind of game has little future, particularly because infrastructure is too fragmented and the developer cannot manage it.
- **Model.** The model is based on the traditional game model since games are sold in boxes then parts of the game are updated from the game site.

Dedicated server

This kind of infrastructure is mainly reserved for subjective games which have traditionally been supplied free of charge.

- **Mechanism.** A central server manages links between players via dedicated servers managed by the users.
- **Advantages.** It is possible to play for a desired time then leave the game and pick it up later. This offers players great flexibility and more freedom.
- **Disadvantage.** This kind of operation is less fair (direct contact with sometimes more experienced players who are better equipped in terms of connection speed).
- **Development.** To alleviate the problem of differences in equipment noted above, the American company Valve has introduced a system that makes it possible to monitor action over time to manage relations between players with low and high capacity connections. This makes it fairer but less consistent because of the time lag between some actions. This kind of game also leads to little ongoing cost for the developer since he makes network code available to the players as limited open source. In this way, they can participate in the game's development without the game's rules being infringed since the developer alone remains in control of the network code.
- **Model.** The free model prevails. This kind of approach makes the game's network code available to players in limited open source. This allows players to be really interactive in the game since they can develop new play areas based on elements delivered to them by the developer. The developer remains the exclusive owner of the network code, unlike point to point systems. Unlike the first model therefore, the game area is monitored by a central server which makes sure that the rules of fairness are observed by the players (an experienced player will not find himself competing with a novice for example). To generate a return on this, methods of payment must be found without making players pay since this would be against the spirit of these gaming zones. Advertising seems to be one of these ways. At the end of each mission, an advertising strip appears at the bottom of the screen where the player's results are posted with his statistics. This

is a way for the advertiser to avoid stopping the game in the middle and to invite players to look at the advertiser's promotional offers without quitting the game.

Proprietary server

- **Mechanism.** The developer owns servers which orchestrate players. This model is very expensive since it requires permanent active management of the game and constant investment in networks. Offering such a game would cost the developer US\$8m to US\$11m in development costs to put it on a network according to John Smedley, operations director at Sony Online Entertainment.

- **Advantage.** The developer manages the whole game leading to high quality services. The number of players connected at the same time is very large (an average of 30,000 a day for *EverQuest*).

- **Disadvantage.** The player has to pay an entry fee, given the maintenance required. Maintenance, support and hosting costs double a product's development cost over one year.

- **Development.** This market will move towards diversification of game categories to expand the installed customer base which is currently mainly young, male and urban. The trend is now towards a hybrid model based on making network code available as limited open source, as for Quake III.

- **Model.** This system generates returns and its architecture is the most developed in terms of playability. It is used for persistent universe type games (for instance Cryonetworks' *Venice*) or role-playing games which call for constant investment in networks, and continuing management and supervision. The only way of generating a return on this is by monthly subscription. For US\$9.95 for example, one has access in the US to the *EverQuest* gaming zone. Players are ready to pay that money because they visit the game zone frequently. This in turn calls for unlimited and fluid connections, in other words broadband. This kind of model seems in any event to be very profitable, to such an extent that Sony is already focusing on developing various new games to expand player's choice and profile. Subscription rates might be cut since developers are talking of the possibility of making the network code available to players under open source so as to improve interactivity and reduce maintenance costs.

A new business model which is not based on technical constraints is starting to emerge with the signature at the end of 1999 of a partnership deal linking AOL and Electronic Arts (EA). This agreement calls for Electronic Arts to be exclusive supplier of online games for all AOL services for a period of five years. Electronic Arts paid AOL US\$81m and AOL acquired 15% of the shares in Electronic Arts's internet division, EA.com. EA is also expected to take 95% of the revenue from online subscriptions and 70% of sales of EA products over the AOL network. This kind of agreement is likely to expand since it brings EA's expertise together with AOL's large customer base.

Another model is interesting: one shot payment or rental for flash games. These little web games are often ordered by sites and paid for in one go or rented for a given period.

Product roll-out models resemble those to which EA and AOL have committed themselves. This method is apparently the most developed in terms of integrating content and services.

Online companies

Traditional offline publishers and developers

Sony, Nintendo, Sega, Hasbro, Mattel, Acclaim, Havas, Microsoft, Interplay, Infogrames and Eidos... The majority of publishers have established an online strategy. They operate in two segments: online selling (games, downloads and updates) and/or online games. In doing this, they have several ways of developing their services - operating them for their own account, developing games for client portals or sites, or developing partnerships. All are developing online products and offline games with an online component. Sony already has a substantial library of online products including *EverQuest* (300,000 subscribers) which is a direct competitor to *Ultima Online* (250,000 subscribers), developed by EA.com, the online subsidiary of Electronic Arts. It seems that the most promising alliances are those with ISPs (internet service providers) which include a package containing games with the connection.

Portals or ISPs

The main portals are Yahoo, Excite, Lycos and Microsoft Network. Each of these portals has a games site: Yahoo Games Channel, Excite Games Channel, Lycos Games Channel and Microsoft Gaming Zone. Their target is to create a full product range in the form of a package as for digital television. The games are significantly different from those which can be found on specialist sites since they are more family games (such as *Wheel of Fortune*, *Millionaire*, card and chess games). The goal is to create a product range likely to keep the internet user's attention and win his loyalty so as to increase his spend.

Game and family sites

Uproar.com, Gamesville.com, Disney's Go.com, Shockwave.com, Pogo.com, GameLoft.com and Games.com (Infogrames). These sites mainly generate revenue from advertising. Commercial sites order flash type games from developers for an uninitiated clientele. These commercial sites hope in this way to achieve two things. They want to expand their customer base by developing the number of pages viewed and the number of visits per site (games can attract customers with new profiles), and keep them.

Specialist sites

In sports for example, ESPN.com, Sportsline.com and Foxsports.com. These sites fill out their editorial content with sports games that are easy to access and keep the internet user on the site. The internet user's profile is then more that of a sports fan than a player.

Game or gaming zone sites and portals

Company name	Site name	Date of creation	Names of games
Havas Interactive	Won.net	Apr 1998	You Don't Know Jack, Wardox, Unreal, Quake 2, Tribes
	Battle.net	Apr 1998	Diablo, Warcraft, Starcraft
Electronic Arts's Westwood Studio	Westwood.com	na	Command & Conquer, Blade Runner
Playnation	Release.now	Sep 1999	Tiger Woods PGA Golf Tour
Total Entertainment Network	Pogo.com	Sep 1999	Board, puzzle and casino games e.g. Wheel of Fortune
Macromedia	Shockwave.com	2 Aug 1999	Centipede, Missile Command and 3D games
Hearme	Mplayer.com	na	Quake, Card games, Tournaments
Lycos	Gamesville.com	23 Nov 1999	Bingo, poker, Football
The Station	Station.sony.com	Mar 1997	EverQuest, FantasyWar, Tanarus, ChronX
Gathering of Developers	Heat.net	Summer 1999	Darkstone, Nocturne, Grand Theft Auto 2, Fly, Psycho Circus
Interactive Commercial Enterprises	Gameplay.com	Aug 1999	Quake 3, Half Life, Aliens vs. Predator, X-wing Alliance, Rainbow Six
Dixons Group Plc and World Telecom	Freeserve.net	Sep 1998	Planet Trivia, Fantasy League Football
3Do Inc	3do.com	na	BattleTanx, Army Men, High Heat Baseball, Vegas games, Uprising
Cryo Interactive Entertainment	Cryo-networks.com	na	Ring, Chine, Riverworld, Gadget
Eidos Plc	EidosGames.com	na	Warzone 2100, Gangster, Commandos, JSF, Formula 1 racing
Electronic Arts	Ea.com	na	President World, Tiger Woods 99, SimCity 3000
Inter Active Media Inc	Global-player.com	na	Roulette, Blackjack, Slots
Oceanus Entertainment	Starpeace.net	na	Role playing games, multiplayer Tetris
Online Gaming Systems Ltd	Ogsltd.com	na	Casinos, Bingo Blast, Lotto Magic
Real Media UK Ltd	Gameslounge.com	na	Multiplayer ranging from action and adventure to sports and platform
Infosources	ZonejeuX.com	na	Quake 3, Counter Strike, Warzone 2100, Re-Volt, Unreal Tournament
Kesmai Corporation	Gamestorm.com	na	Alien, Starship Troopers, CasinoPoker, Quake III
IEntertainment	lencentral.com	na	Warbirds, Quake, Duke Nukem
Ubi Soft	ubisoft.com	April 2000	Choice of many online games

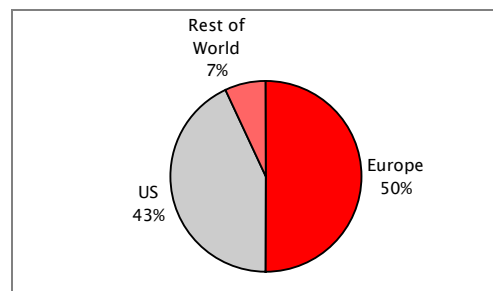
Source: SG Cowen

Obstacles to online games

There are many obstacles to the development of online businesses and some of them are specific to each country.

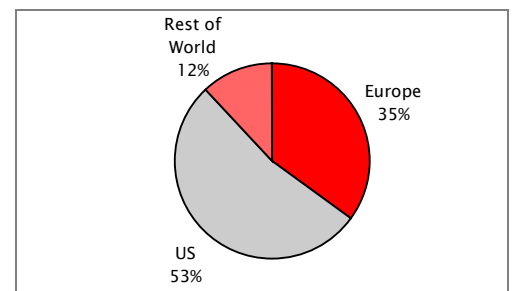
- The internet penetration rate is still limited and there are major discrepancies from one country to the next. Europe is however expected quickly to catch up with the US.

Global Internet connections 1998



Source: EITO 2000

Global Internet connections 2001



Source: EITO 2000

- The problem of monetisation and online payment security is far from being resolved. The shift from a free to a paid model does not seem to be as easy as might have been anticipated in that internet users are used to services being free.
- No standard has been introduced and each site is testing its own method of payment. The type of game which for the time being really has strong turnover in the US is virtual casinos. Datamonitor estimated the amount of bets made at US\$1bn in 1999 and US\$2bn in 2001.
- The cost of telephone calls varies substantially from one country to the next and is still a real obstacle in countries such as France while the cost of a local call in the US is virtually zero.
- Bandwidth capacity is the main limitation on the development of internet games. Developers are obliged to reduce the quality of graphics (by reducing the number of polygons). Reaction time is crucial and therefore requires a certain bandwidth.
- Online games suppliers also have to take account of the installed base. A Pentium and a Pentium III (and soon a Pentium IV) do not have the same capacity while sound and graphics cards are obsolete every six months. Supply may build in technological change, but demand does not follow at the same frenetic pace. Developers are obliged to take account of this and therefore cannot use to the full the capacity of new PCs as long as the installed base is not fully replaced. It is for this simple reason that the new generation of consoles includes internet access. The future of the internet may not be on PCs but rather on consoles, TV or mobile phones, the price of which is much more affordable. Microsoft's decision to develop a console amounts to admitting that PCs are not the best support for internet access.

Consequences for games companies

Given the number of technical obstacles, we believe it is unlikely that online games will have a real impact on companies in the video games industry for several years, particularly for games which need broadband. In the long term, the roll out of connected platforms as we know them today and the birth of new platforms such as interactive television suggest a new market for content providers. In the meantime, it is now possible to play on a network or download games on a PC. That is a first step.

Other platforms

With the appearance of WAP and particularly UMTS phones, the mobile phone has become an attractive support for games since it is completely mass market and is very easy to use. Interactive television looks like the next major support for games once the networks (cable and satellite) are fully rolled out and the technology used by set-top boxes is mastered. We believe that the announcement at the end of January of a partnership between Pace Micro Technology (an English set-top box manufacturer) and Sega to supply games on set-top boxes (with a hard disk) was a significant first step for this new support. It is expected to enjoy strong growth to 2003/2004.

Interactive TV (iTV): the next platform

Interactive television combines a conventional medium, TV, with interactive/internet content. The migration from analogue to digital has helped to increase sixfold television companies' network capacity. This has led to strong growth in the number of channels supplying content that is traditional but more specialised as a function of demand. Theme channels account for a growing proportion of supply at the expense of so-called general channels even if the latter still account for the majority of the market.

Television is therefore a mass-market product with an installed base beyond comparison with PCs or consoles. Everybody knows how to use a remote control, the interactive TV navigation tool par excellence. To be interactive however, a television needs a digital decoder combined with memory. Interactive products are hosted on the decoder or on a server.

Interactivity can be summarised as three functions:

- Programme enhancement (enhanced TV) means that new functions are attached to a given programme. One can for example get other teams' results during a football match.
- The development of interactive advertising means adding traditional advertising to content. The increasing number of cable or satellite channels makes it possible to target messages better according to the audience.
- The development of new content (quizzes, weather, astrology) and t-commerce. Graphics are however still closer to Minitel than the web.

In August 1999, Forrester Research estimated that interactive television would generate EUR18.4bn of revenue in 2004. According to Datamonitor, the number of European and American households equipped to receive interactive television will rise from 10.3m in 1998 to 67m in 2003. In Britain, according to an August 2000 report from Oftel (the UK telecoms regulator), one in five British households subscribed to digital TV only two years after it was launched. For the time being, subscribers' leading motivation is a bigger number of channels while fewer than one in five subscribers use interactive services. The subscriber profile shows the better-off are over-represented.

Forrester anticipates that interactive television users will outnumber online users of PCs from 2005. The company also suggests interactive television will generate EUR10.1bn in advertising revenue, EUR6.45bn in t-commerce and EUR1.84bn in subscriptions in 2004, 55%, 35% and 10% of the total respectively.

Technical aspects

The development of interactive TV requires set-top boxes to become more common.

New generation set-top boxes will have a broadband multimedia interface to read CDs or DVDs and most will have a hard disk which will make it possible to store information. This technology, called PVR (personal video recorder), makes it easier to control what one wishes to see and above all to avoid advertising. In France, Canal Satellite (Vivendi Universal) and Noos (Suez) have confirmed that their forthcoming decoders, whose launch is planned for September 2001, will include PVR functions while TPS announced at the end of 1999 that it was working on a hard disk device.

In the US, the main manufacturers are Scientific Atlanta and Motorola, together with General Instruments. Pace of Britain is the European market leader, followed by Thomson and Sagem of France. In December 2000 a new player, Tak, was born. This is a joint venture between Microsoft and Thomson whose set-top boxes are built directly into the television. These products have been marketed directly from large stores since February 2001.

Content

Interactive television will make it possible to supply content of varying kinds:

- **T-commerce.** This is online sales of products and services such as music, cinema seats, financial services and online banking.
- **Audience feedback.** Companies will be able to create a database which will make it possible to supply the necessary statistics to various content providers.
- **Interactive advertising.** This is tomorrow's advertising with 3D objects that can be viewed together with technical data sheets. This will be regional and even local as well as national and international.
- **Information services.** These already exist. They include direct share price quotations, weather and general information.
- **The web.** The internet content that we know today will be available with its general or specialist search engine portals and of course e-mail. The web on a PC must however not be confused with the web on TV. The web on a PC is information rich and mainly professional. The web on TV only gives information that has been specially selected and repackaged for television. Navigation is not as good since the remote control does not offer as much functionality as a mouse. To shift from the web to interactive TV will therefore mean completely new roll out of the advertising interface. Font sizes are not equivalent for example. The most suitable content will also have to be selected with the page to be read substantially reduced.

Whether it be programme enhancement, interactive advertising or t-commerce, the sector's success depends on interest from the major television channels, advertisers, audiovisual content producers and theme channels. Above all, it depends on TV companies such as Canal+, TPS or Noos in France, Via Digital in Spain, Tele Piu in Italy and BSkyB in the UK. The operators are currently the decision-makers since they are the ones who will allocate a larger or smaller amount of their pipeline to interactive content. BSkyB for instance hosts Open, a gallery of information services and online shopping which is visited regularly by 45% of the company's 5.5 million subscribers in March 2001.

Video games suppliers want to strengthen their presence in this young sector

The video games industry's interest in this market is not recent. When Dreamcast was launched, Microsoft did not hesitate to build into the game console its WebTV software giving access to interactive television channels and the internet. Technically, Dreamcast uses Microsoft's operating software, Windows CE, chosen also for the future X-Box and by WebTV, now Microsoft TV.

There are many children's channels in the US such as Disney, Fox Kids and Cartoon Network which now operate in Europe and to which we can add channels such as Canal J, Play Jam, LudiTV and Game One. Game One (owned by Infogrames) is different from the other channels in that it specialises in the games industry. Game One already has a web site which is expected rapidly to evolve towards an integrated vertical portal including information on its TV programmes, general information on the games industry, a platform for online commerce and one for online games. In other words, the company plans to deliver the same content on television and on the internet. This example shows perfectly how television and the internet are converging.

First outlines of a business plan

The disappearance of the hardware support raises the problem of payment for video games accessible digitally (by cable or satellite).

- **Pay per view.** This is the kind of solution used by Pace and Sega for games on Dreamcast. In fact, this kind of approach depends exclusively on games channels because they are the ones which will decide whether or not to use this kind of service.

- **Advertising.** PlayJam is a telling example. This is a games channel produced by a young British company called Static which originally specialised in design for television and which is 10% owned by Sky Digital. PlayJam offers simple games (such as quiz and action games) with prizes, aimed at families more than console fans. The channel gets revenue from advertising and selling advertising space on game screens as well as sharing revenue with the operator.

It has operated since October 2000 on Canal Satellite where each subscribing household played an average of 1.3 times per month on a game offered by the package, and since November 2000 on TPS. Based on these results, the company is negotiating with cable operators and WAP portals in France. It is also on BSkyB in Britain and is in discussions with other Canal Satellite packages in Europe. At the end of 2000, PlayJam was accessible in 7.5 million European homes (including 5 million in the UK).

- **Subscription.** This is without doubt the method of payment best suited to this sector where subscription is common. The technology also still has to generate real excitement among consumers. In any event, this is the route chosen by Visiware which has the leading games catalogue for interactive TV (32 games available on subscription).

The market is promising

In the UK, the BSkyB satellite platform has offered interactive services since October 1999 through its subsidiary Open. In June 2000, 3.4 million households had access to these services and 47% used them during the month, 11% made a purchase and of those 35% repeated the purchase.

The company estimates that transactions will reach £350 per subscriber per year by 2005.

In France, digital television reached more than 3 million households in January 2001. 150 million pages were viewed per month on TPS, the PMU at home generated EUR46m of bets on Canal Satellite and nine subscribers out of ten looked at the programme guide, whatever the package.

The agreement between Sega and Pace Micro Technology is a first significant step. After abandoning production of its console, Sega decided to supply Dreamcast technology in the form of a chip which can be built into electronic devices and in particular into set-top boxes.

With capacity of about 150 KBps, there is no difference in the image quality or the speed of execution compared with a GD-ROM game.

...but is still hard to identify

Is interactivity the future of television? From the first trials in 1979 (Qube/Warner in Ohio and Videotext in Britain) to the wave of 1995 which saw the failure of media majors including Disney/Americast and Time Warner in Orlando, as well as telecom operators such as TeleTV, GTE/Main Street, nothing has lasted more than a few months. Even what was supposed to be the largest network in the world, announced in 1996 by Hong Kong Telecom for an investment of US\$1.5bn, finally opened in 1999 and did not enjoy the expected success.

What is more, it is almost only France and Britain where digital and interactive packages have reached a mass market and subscribers have signed up first and foremost for theme channel packages, not for interactive TV.

In France, of the 3 million households with digital television, 45% would not consider paying for interactive services according to Forrester Research.

The future of second-generation set-top boxes is therefore still uncertain. Companies such as TiVo and ReplayTV, which have made a television with a hard disk and very substantial memory have scarcely sold 100,000 boxes between them in a year on the American market.

In Europe, programmes are not as inundated with advertising as they are in America. Unless packagers subsidise decoders, the television niche in Europe could be even smaller.

E-mail might drive a surge

Interactivity has therefore not triggered the euphoria that the internet caused. In fact, like the web, interactivity could owe its expansion to electronic mail. Two thirds of Europeans say that they do not have a computer in their house or that they do not use one. TV mail could help them discover the leading use of the internet - electronic mail. In June 2000 Open, BSkyB's interactive service, already had 900,000 TV mail users.

Reasons to be optimistic

In 2000 about 1.1 billion households had television sets around the world. 34 million of them had access to digital services with this number likely to rise to 221 million by 2005.

We estimate the extra revenue generated by interactivity in the American market alone at US\$23.5bn in 2005. The US only accounts for 10% of households with a TV set and Europe, with Open the most highly developed interactive television portal in the world, had about a year's lead over the American market in terms of interactivity.

This lead is due to three main reasons:

- Satellite operators are more at the cutting edge in this business and satellite is more popular in Europe.
- PC penetration is higher in American households.
- Europeans have used teletext for a long time, although it has quite primitive architecture.

According to the National Cable Television Association, the US is expected to catch up from 2001 when 75% of the cable networks will have enough bandwidth to offer interactive services. In interactive television however, cable is not the panacea. The majority of American households are cabled though and in 2006 analogue signals will have been replaced completely by digital.

The games industry could be in pole position to take advantage of this new mass-market platform within everybody's reach and whose game content will be indispensable to attract families and command their loyalty.

Other mobile devices and online handsets

Two other platforms are emerging - mobile phones and personal digital assistants (PDAs). Games on these two platforms will clearly be quite different from what can be found on more powerful machines. Nonetheless, there is demand and it can take only a matter of days to develop a WAP game.

Content providers are on the alert

The games offered will remain very simple (such as online *Tetris* and *Space Invaders*) and therefore offer low value added until mobile phones with the capacity to provide sufficient data transfer to broadcast games online arrive. This is due to low bandwidth and a lack of handset ergonomics. They will however enable developers to set up partnerships with operators or packagers who will later distribute games that generate potentially more attractive revenue. We could then see the emergence of a new category of games which are much more highly developed, including the appearance of specific handsets with high resolution colour screens, memory storage capacity of several hundred megabytes, opening the way to much more elaborate graphics, and more advanced or quite simply more user-friendly functions. This last criterion should then make it possible for a new class of online players to develop (women, people over 35) playing family-type games. Meanwhile younger players could find their favourite games on their mobiles and juggle their consoles, PCs and mobiles.

Then, with the increasing number of connections and degree of technical integration of mobiles, games purely intended for this kind of support will be able to develop. Here too however, nothing should be expected before 2007 or 2008 for reasons relating to both technology and consumer habits. Habits may

develop very quickly, as has been shown by the success of i-mode in Japan (7 million subscribers in July 2000 and 20 million in March 2001). It should also be added that the first downloaded games will not be interactive since connection and data transmission speeds will not really be attractive for real time transmission until UMTS enters service. Games will offer small exchange volumes initially if they want to be able to function correctly. Multiplayer games are for example expected to develop gradually but not before the arrival of new platforms. Single-player modes are therefore expected to dominate initially.

Business models

Telecom operator pricing

Operators' pricing policies will be one of the key factors in the success of this new technology. We are already moving towards a model where the subscriber will (as on fixed line networks) pay a fixed fee plus an extra charge for downloaded packets such as NTT DoCoMo, the pioneer in this area with i-mode, already does. Online shopping might also be subject to a tax by the operator (NTT takes 9% of the value of each online transaction). The operator's product offering is also likely to consist of several service packages like those offered for pay per view. One can see in this way why Nokia anticipates ARPU (average revenue per user) could rise from an average of US\$50 around the world today to \$80 on migration to UMTS. According to management, of the US\$80, 88% would come directly from consumers with the remaining 12% from advertising. For consumers that would represent a US\$20 per month increase in the budget, a 40% rise. This 40% would of course be dependent on new mobile internet services. But will the applications developed be good enough? They are in fact the keystone to the whole edifice. It was they that led to the flop of WAP but success of i-mode in Japan.

Agreements between operators, packagers and developers

The partnerships signed in 2001 between NTT DoCoMo, Sony, AT&T, Telecom Italia, KPN and two other European operators suggest the organisation of a new system related to the transition towards mobile internet and games on mobiles. We should first distinguish between three types of companies: operators, packagers and finally developers. First, operators control access to their network. Packagers then supply operators with the services they need to attract customers. Game developers bring packagers game content. Under the various conceivable scenarios, these are the different ways for a developer to offer an online product on mobile internet. Let us take the example of Sony, NTT and Electronic Arts. If EA wants to integrate the services offered to NTT's customers, two solutions are available to it. Either it can go through NTT directly or it can go through Sony and the packager, which includes the Sony game portal in its overall service. The two approaches present different financial outcomes. If EA goes through the operator directly, it generates higher profits than if it goes through Sony which sells on to NTT the package containing EA products via the packager. By offering its service through Sony however, EA gains access to the customer base built up by Sony through its online site as well as through the installed console base around the world. This may not generate high margins but should generate large volume and therefore create a major gearing effect courtesy of the royalties that might be paid. We believe that contracts between Sony and NTT for instance will not be exclusive since they would deprive one another of potential clients (for NTT, future X-Box users for example and for Sony, clients of Japan Telecom).

A new organisation similar to the traditional console pattern

Machine makers will therefore try one way or another to lock up the market to take advantage of the comfortable role of intermediary between developers and packagers, and therefore operators. The market model is likely to be equivalent to that currently used in the console market. Royalties which might possibly be paid back to developers could then be calculated by reference to the number of packets downloaded by users.

For console manufacturers, the advantage is very largely with Sony which has a presence both in online games via its website station.sony.com and also in mobile phones. The group therefore no longer needs to prove its expertise in video games. Microsoft looks late in this market on the other hand. It has expertise in the online games business through the *Microsoft gaming zone* or *msn gaming zone* but the company is lagging in mobile phones. It plans to make up this lag by setting up partnerships with mobile phone makers such as Motorola for example. In March 2001 for instance, Microsoft, Motorola and Arch Wireless announced a partnership to make Microsoft's Hotmail service available to future mobile internet users. That looks like only the beginning bearing in mind how hungry Bill Gates' firm is.

European companies

Positioning

The companies differentiate themselves mainly by whether or not the three major businesses in the industry are integrated. These are development, publishing and distribution.

- We call 'global players' those companies which have integrated the three businesses internationally. In Europe these are Infogrames, Ubi Soft and Titus. Cryo has integrated the three businesses but is only just starting to expand internationally and build a distribution network. CDV is in the take-off stage in development and only has a distribution network in Germany.
- Eidos has integrated the development and publishing businesses but the company does not have a distribution network.
- Kalisto and Phenomedia are pure developers.

Predators and prey

In the long run, the companies which have not succeeded in generating profits when the new cycle now starting reaches its peak (in 2004-2005 by our estimates) will not be able to survive. We rate the companies potential predators and potential prey as follows:

Potential predators and prey

Potential predators	Potential prey
Infogrames	Cryo
Ubi Soft	Kalisto
Phenomedia	Eidos
CDV	Titus

Source: SG Cowen

Strengths and weaknesses

European companies' strengths and weaknesses

	Strengths	Weaknesses
CDV Software	<p>Quality of first PC games shows real potential. Developing international exposure. Catalogue covers most of the market segments. Products well positioned in PC sales rankings. Strong ties with east European development studios.</p>	<p>Control of production process for timely marketing. In competition with many large publishers. Small catalogue presents product risk.</p>
Cryo	<p>Average product life cycle a little more than one year. Building a distribution network in US and Europe. Vircom acquisition completes both online game development division and the Cryonetworks technology business.</p>	<p>Cryo does not own all the licences Cryo competes with worldwide companies which already have a network and have sold in for many years. Many competitors for SCOL. Exposed to current internet market volatility. The company is not yet profitable.</p>
Eidos	<p>Strong licences and brands. Absence of fixed costs of distribution network helps increase gross margins. High-quality development teams. High-quality marketing strategy.</p>	<p>Lack of control over development deadlines hurts costs and reduces sales potential. Limited number of sell-ins. Loss of all publishing contracts for other companies' products. Breakeven has not yet been reached. Heavy dependence on external studios. Twin listing on Nasdaq heightens sensitivity to US market. No distribution network.</p>
Infogrames	<p>Infogrames management has on several occasions been able to show its ability to react through a clear strategy. Infogrames' position as world-scale challenger suggests strong growth potential. Infogrames is expected to strengthen its catalogue in sports games, one of the main segments. Control of the distribution network and catalogue diversification by platform, type and price bracket.</p>	<p>Acquisition of GT: the most difficult part is still combining development strengths and internal tools from each of the two companies' studios. Infogrames will have to move closer to EA's product quality. Infogrames CB 1.5% 04: limited probability of conversion (we put it at close to 50%). Infogrames CB 1% 05: this convertible offers a delta of over 0.96 and as a result, a very strong probability of reaching the conversion price.</p>
Kalisto	<p>Expertise in product development management. Strong experience in developing upmarket products.</p>	<p>Risk of bankruptcy if the company does not find new financing before end June 2001. Risk related to the limited number of products. The number of customers will remain limited, particularly if the company sells its products in packages to the same publisher.</p>
Phenomedia	<p>Strong history of games development. Controls content for mass-market products across different media. Historic focus on high-margin PC games, no dependence on consoles. Well positioned for X-Box game development (close to PC). Stable revenues from advertising games reduce overall volatility of the group. Track record of effective development cost control.</p>	<p>No direct access to the market. Strong competition from global publishers. High dependence on one product, <i>Moorhuhn</i>, (FY00: 40% of sales, 60% of EBITDA).</p>
Titus	<p>Diversified catalogue by product type and platform. International distribution network. Conservative online investment strategy.</p>	<p>Fragile balance sheet because of high probability that CBs will not be converted. Lack of visibility over company's growth potential. Interplay in process of recovering.</p>
Ubi Soft	<p>Worldwide distribution network. Highly diversified catalogue by category and platform. Almost exclusively internal R&D helps control products throughout their production cycle. Good experience in acquisitions, helping company to manage integration of medium-sized companies well.</p>	<p>Uncertainties remain on H1 2001/02, particularly on margins. Ubi Soft is the centre of the 'Guillemot galaxy'. Size of internal R&D which implies management of it has to be improved. Amortisation of R&D expenses over three years will help Ubi Soft report profits. After adjusting for this accounting practice however, the company has not yet reached breakeven. The strategy has so far not yet helped the company to establish itself worldwide as a major player in a sector which is consolidating.</p>

Source: SG Cowen

CDV Software

Europe
Germany

BUY

Video games

May 2001

A new player with high potential

Price at 23/05/01

EUR48.2

FAZ 23/05/01

1,901

Market capitalisation

EUR39m

\$33m

Value of free float

EUR13m

Reuters

OGGG.F

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- CDV Software AG is a German company that develops, publishes and distributes entertainment and technical software.** Originally, its main activity was the publishing and distribution of software in Germany. Its strategy is to shift from distribution to development and publishing of entertainment software. In 2000, CDV published its first PC games including *Sudden Strike*, which sold over 300,000 copies in Europe. CDV turned in profits in 2000 though the market was not expecting a return to profitability until 2003.
- CDV's strategy is straightforward: it aims to expand its catalogue and sell its products globally.** In 2000, the company opened two offices handling product marketing and management of distribution agreements in the US and the UK. This year, CDV intends to open two offices in France and Asia.
- We expect sales of EUR20.2m in 2001 and EUR32.2m in 2002, with growth of 39% and 59% respectively.** Since the company is starting a new activity, investments will be focused mainly on R&D and marketing. These investments will impact margins in the current financial year, but the fact that the company is already making profits is a major strength in current market conditions. We estimate that CDV will generate operating profit of EUR1.7m in 2001 (margin of 8.3%) and EUR4.7m in 2002 (margin of 14.5%).
- We are initiating coverage of CDV Software Entertainment as a Buy.** Based on a EUR61 price target, offering upside potential of 23%, CDV's EV/sales multiples come to 1.2x for 2002 and 0.8x for 2003 and would still be below sector medians.

	Reported earnings (EURm)	EPS (Adj) (EUR)	P/E	P/E relative	Cash EPS (EUR)	Price/Cash EPS	Net dividend (EUR)	Gross yield (%)
1999	-1	-2.52	nm		-2.43	nm		
2000	2	2.66	18.10	0.82	2.96	16.30	0.00	0.00
2001e	1	1.51	31.90	1.36	1.91	25.20	0.00	0.00
2002e	3	3.88	12.40	0.64	4.36	11.00	0.00	0.00
2003e	5	6.77	7.12	0.44	7.47	6.45	0.00	0.00

EPS trend 1999-2003: NS

High/low 12 months (EUR)	110.0 - 34.5	Performance in %	1 mnth	3 mnth	12 mnth
Price/book value 2000	2.99	Ordinary shares	25.2	-5.5	-52.7
Dividend cover 2000	nm	FAZ	3.0	-0.3	-8.4

Profile

CDV Software AG is a German company that develops, publishes and distributes entertainment and technical software. It has been listed on the Neuer Markt since April 2000. Originally, its main activity was the publishing and distribution of software in Germany. Its strategy is to switch from distribution to development and publishing of entertainment software. In 2000, CDV published its first games for PC including *Sudden Strike*, which sold over 400,000 copies in Europe and *Cossacks*, which sold over 200,000. CDV turned in profits in 2000 though the market was not expecting a return to profitability until 2003. This year, the company hopes to produce around ten major games, which will confirm the switch from its traditional publishing-distribution business. CDV's products are present in the markets via distribution agreements and its own network in Germany. At present CDV specialises in PC games but plans to move into consoles in 2002 with four products for the X-Box.

Until 1999, CDV produced one product per year in the 'edutainment' software sector. Its first game, *Wet* was designed with a small budget of DM0.5m and sold 600,000 copies in Germany and in Europe in 1997 and 1998. Its main activity is now game software development, which offers genuine added value but requires investments in R&D, both in-house and externally via minority shareholdings or partnerships in development studios.

The German PC game market is one of the biggest in Europe. Its latest products were among the top ten PC products in France, Germany and the UK at the start of the year.

Strategy

CDV's strategy is currently focused on developing its new activity. It must expand its catalogue and sell its products globally. In 2000, the company opened two offices handling product marketing and management of distribution agreements in the US and the UK. The company's products are present in Asia (Japan, South Korea, Hong Kong, etc.), Europe, Russia and the US. This year, CDV intends to open a further two offices in France and Asia.

CDV has access to the developing Eastern European market and can expand in this direction. It intends to expand its R&D both internally and externally. It has just opened a development studio in Frankfurt and plans to strengthen its teams and project managers to handle external developments. In the long term, CDV aims to acquire minority shareholdings in development studios (it is currently in contact with three) to have greater control of production.

At present, virtually all its developments are external and CDV plans to take on 25 new staff this year to strengthen its development teams and strengthen the marketing of its products. The shareholdings in development studios will boost client loyalty and create a more organised and tightly controlled development network. CDV still has an eye on new opportunities and is seeking a PS2 development team in the medium term for when development studios are capable of working with this new console whose technology is more complex than that of the X-Box.

CDV will leverage the potential of its top products by creating two suites (a *Sudden Strike 2* is already planned), add-ons and a product line intended for its games approaching the end of their life cycles.

The company aims to develop internet activities (e-commerce and online games). It is in the process of developing its first online game *Exploman*, which will be available this year. How this new product fares will determine its online strategy and will also demonstrate CDV's capacity to create this kind of product. CDV intends to create editorial content, add-ons, patches, etc. on its website to build a community for these products and build customer loyalty.

Strengths

- The quality of its first PC games demonstrates it has genuine potential.
- Its international expansion.
- As of this year its catalogue covers all segments of the games market (strategy, role-playing games (RPG), action, sports, etc.).
- The strength of its graphics and gameplay allowed to occupy the top slots in the PC games sales rankings in Germany and the UK for several weeks.
- CDV can easily build partnerships with development studios in eastern Europe where engineers are well trained but cost less than in western Europe.

Weaknesses

- One of the main risks is not being able to control production processes so that products are launched in time. If a launch misses the 'season', this seriously affects costs, which are proportional to development time, and revenues. However, since PC products have a longer lifecycle than consoles the risk is minimised. To overcome this problem, CDV plans to develop a network of external development studios by acquiring minority shareholdings in these studios to strengthen its control of production. We cannot yet say whether this strategy is working or not, but the system implemented with developers is paying off at present.
- CDV Software is in competition with several big publishers. Its strong presence in Germany, where it has its own distribution network, gives it a great deal of bargaining power. However, the company does not intend to extend its distribution network to international markets, which means it does not have direct access to points of sale outside its domestic market.
- The limited size of its catalogue is a risk at present if sales are focused on a few flagship products. However, CDV tends to be prudent in its estimates and has correctly valued the potential of these products.

Outlook

We expect sales of EUR20.2m in 2001 and EUR32.2m in 2002, with growth of 39% and 59% respectively. With the change in the product mix and products to be developed for consoles the gross margin is expected to shrink from 81.2% in 2000 to 74.4% in 2001 and 68.5% in 2002. Since the company is starting a new activity, investments will be focused mainly on R&D and marketing. These investments will impact margins in the current financial year, but the fact that the company is already making profits is a major strength in current market conditions. We estimate that CDV will generate operating profit of EUR1.7m in 2001 (margin of 8.3%) and EUR4.7m in 2002 (margin of 14.5%). We are confident in our estimates given the good visibility in the PC market and the conservative nature of these forecasts.

In April 2000, CDV raised EUR10m. Its cash position stood at EUR10.3m at end-2000 and it has no debts. Consequently, it has the means to finance its development strategy.

Valuation

The DCF method gives a value of EUR80.6 per share. At the same time, CDV's EV/sales and EV/EBITDA ratios put it at a high discount to its international rivals due to:

- A market discount linked to the share's listing on the Neuer Markt.
- The fact that the company is little known as it has practically never been presented to the financial community since its IPO in April 2000.

DCF model

EURm	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Operating cash flow	1	3	6	9	13	16	19	20	24	29
Capex	1.5	2	2.3	2.8	3.1	3.5	4	5	5	5.9
Change in WCR	0.9	1.8	2.8	2.6	2.6	2.6	2.3	1.8	1.0	1.0
Free operating cash flow	-1	0	1	4	7	10	13	13	18	22
Discount rate	17.5									
Sum of discounted flows 98-07	24									
Perpetual growth rate	3.0									
Discounted terminal value	31									
Enterprise value	56									
(-) debt	-8									
(+) long-term investments	2.0									
(-) minorities	0.0									
Equity value	65									
Number of shares (m)	0.81									
Value per share	80.6									

Source: SG Cowen estimates

WACC calculation

Shareholders' equity 01	14.28
Net debt 01	-7.51
ND + SE	6.78
ND/(ND + SE) (%)	-111
SE/(ND+ SE) (%)	21
German 10-year bond yield (%)	5.05
Market risk premium (%)	5.50
Beta	1
Cost of equity (%)	10.6
Debt rate (%)	6.5
Tax rate (%)	35
Net cost of debt (%)	4.25
WACC	17.53

Source: SG Cowen estimates

Conclusion

This new player's strategy is strengthening its position with quality products in a PC market that is less cyclical than the console market and in which visibility is better. CDV's cautious approach to next-generation consoles and online activities will enable it to move into these two markets when the time is right. 2001 will see the company's international expansion and confirmation of the quality of its development teams through its products, which are beginning to make CDV a sizeable player - particularly in the RPG segment.

We think that CDV is a genuine investment opportunity. Our share price target is EUR61 (+23%), which gives EV/sales ratios of 1.2x in 2002 and 0.8x in 2003, compared with the European sector medians of 1.9x in 2002 and 1.5x in 2003.

We are initiating coverage of CDV Software Entertainment as a **Buy**.

Key figures
CDV Software
Enterprise value

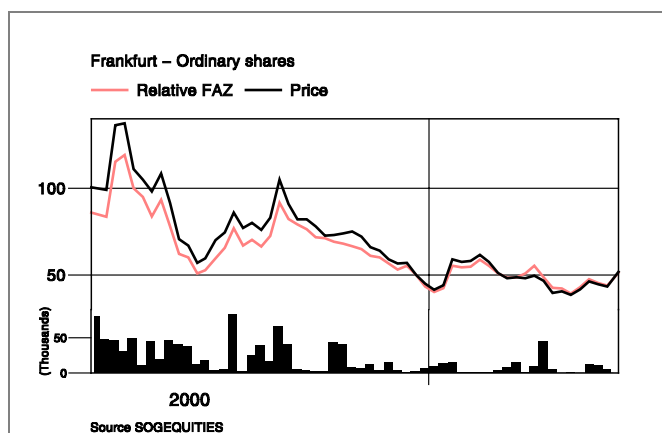
	EV/ Turnover	EV/ EBITDA	EV/ EBIT
2000	1.98	10.96	12.11
2001e	1.46	14.81	17.70
2002e	0.92	5.88	6.37

Shares (000)

Daily trading volume	13.971
In issue	810

Potential shares (000)

Convertible bonds	none
Warrants	none



	Turnover (EURm)	EBITDA (EURm)	EBIT (EURm)	Operating margin (%)	Reported earnings (EURm)	ROE (%)	ROCE (%)
Hist peak (2000)				16.3			
1999	7	-1	-1	-21.6	-1	-491.5	841.6
2000	15	3	2	16.3	2	31.9	148.5
2001e	20	2	2	8.3	1	8.8	22.9
2002e	32	5	5	14.5	3	19.6	32.7
2003e	51	9	8	15.9	5	26.9	36.5

	Cash flow (EURm)	Capital expenditure (EURm)	WCR incr/decr (EURm)	Free cash flow (EURm)	Net debt (excl. conv.) (EURm)	Gearing (%)	Interest cover (x)
1999	-1	0	0	-1	0	-169.8	nm
2000	2	1	2	-1	-10	-77.8	nm
2001e	2	2	1	-1	-8	-51.9	nm
2002e	4	2	2	0	-6	-32.6	nm
2003e	6	2	3	1	-6	-24.5	nm

2000 sales breakdown

Germany	72%
Europe	22%
Other	6%

Shareholders split in 2000

W. Gäbler	38.5%
C. Oppermann	19.2%
C. Gerlinger	3.9%
G. Koning	0.4%
Free float	37.9%

Cryo

Europe
France

HOLD

Video games

May 2001

Shift in product catalogue under way

Price at 23/05/01

EUR7.6

MidCAC 23/05/01

2,540

Market capitalisation

EUR94m

\$80m

Value of free float

EUR34m

Reuters

CEET.LN

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- **Previously a specialist in PC games for adults, Cryo is now shifting its catalogue** onto the segment of new-generation consoles, with products in different games genres (action, adventure, sport, etc.), to widen its appeal and reach a broader customer base.
- The company made a series of acquisitions in the first half of 2000 to develop its distribution network. The transition towards its new market and the setting-up of its distribution network – notably in Europe – have lasted longer than expected and hurt margins in 2000. We believe the changeover will be completed this year.
- **Sales in the first quarter of 2001 (to 31 March) were EUR7.56m, up 143.5%.** This good performance resulted from robust 95% organic growth.
- **Cryo's catalogue should contain 40 offline products this year and the company intends to stabilise its output at around fifty products from 2002 onwards.** We expect sales to grow 45% to EUR72.6m for the full year. Our estimates call for EUR4.6m of operating profit in 2001 (against a loss of EUR3.6m in 2000) and net profit (before goodwill) of EUR2.5m (against EUR11.9m in 2000). In our opinion, the fruits of the recent shift in strategy should begin to show through in 2002.
- **We are initiating coverage of Cryo with a Hold recommendation.**

	Reported earnings (EURm)	EPS (Adj) (EUR)	P/E	P/E relative	Cash EPS (EUR)	Price/Cash EPS	Net dividend (EUR)	Gross yield (%)
1999	1	0.10	75.30	1.92	0.69	11.00		
2000	10	0.79	9.67	0.30	2.03	3.75	0.00	0.00
2001e	0	0.12 *	64.60	4.21	1.32	5.76	0.00	0.00
2002e	2	0.25 *	30.50	2.62	1.87	4.08	0.00	0.00
2003e	6	0.48 *	15.90		2.43	3.13	0.00	0.00

EPS trend 1999-2003: +47.5%

*0.0002 & 0.0011 & 0.0028 after depreciation of goodwill

	High/low 12 months (EUR)	Performance in %	1 mnth	3 mnth	12 mnth
Price/book value 2000	28.8 - 5.1	Ordinary shares	22.7	-6.0	-59.4
Dividend cover 2000	2.32	MidCAC	5.6	2.8	1.3
	nm				

Profile

Cryo, historically specialised in PC games for adults, is reshaping its catalogue to position itself in the new generation of consoles, with various kinds of games (action, adventure, sport, etc.) to widen its customer base. Management intends to become a fully-fledged player in the sector and at a global level. It is seeking to meet this goal by setting up a distribution network that enabled it to distribute 71% of its products directly last year, up from 15% in 1999. Cryo acquired five companies in 2000: Dreamcatcher, a Canadian distributor; Homesoftware, a Benelux-based distributor; German distributor Modern Games; TAC, a distributor that also makes accessories for consoles, and lastly Vircom, a Canadian company specialised in developing online games and internet tools. The company therefore made substantial investments in 2000, aimed at building up its distribution network at a worldwide level as well as repositioning its catalogue.

Cryonetworks is the group's unit specialised in online operations, in other words developing online games and 3D internet sites and selling its SCOL (Standard Cryo On Line) technology. It has been listed on the Nouveau Marché since September 2000. Cryonetworks carries out three kinds of business:

- Exploiting the development of its SCOL programming language via a VAR network that the company is setting up at a global level;
- Developing internet applications for third parties;
- Adapting Cryo games to the internet.

SCOL is a script language, that is a programming language that enables 3D environments to be developed, and gives users the possibility to exchange information among one another in addition to the exchange of information between the server and the site. Drawing on its experience of six years, Cryonetworks has created five massively multiplayer online games, including *Venice*, *Treasure Hunt* and *FOG*, and has already sold 80 SCOL licences. From 2001 onwards, the company plans to develop two to four massively multiplayer online games per year.

The company derives income from selling access to a game via its dedicated website or in a CD-ROM package, in addition to revenue from monthly and annual subscriptions. Cryonetworks' online games are aimed at hard-core adult gamers. According to the company, the break-even point for its games stands at 80,000 users by product. Assessing precisely the overall cost of a massively multiplayer game in a persistent world is very difficult, because of the maintenance charges relating to the game. The budget of an online game at Cryo breaks down into:

- product development, estimated to be about EUR0.8m.
- renting bandwidth and website hosting, estimated at EUR2.3 by player per year.
- costs incurred in terms of running the game's virtual community, estimated at EUR0.25m per year.

The average budget earmarked for each online venture stands at EUR1.2m. The company puts a game's life span at three years. The oldest game, *Mankind*, the latest version of which was released a little more than a year ago, has not enjoyed a very satisfactory subscription renewal rate (but generated nearly EUR80,000 in sales in Q1 2001). Until now, only a few games such as *Ultima Online*, a massively multiplayer game in a persistent world developed by Electronic Arts have managed to exist for more than a year, on the back of substantial marketing and maintenance budgets.

The company has released two applications based on its programming language. SCS is aimed at game developers and Imaginer caters for retail customers. SCOL's main advantage is that it is highly user-friendly and above all very light. SCOL is a good script language, but kind of 3D product can now be developed by combining languages such as C++, Java and Java Script. SCOL, nonetheless, does allow users to save time in terms of development.

As SCOL sales are directly related to growth in the 3D online field, Cryonetworks has been hit by a marked slowdown. Cryonetworks' client base included a high percentage of internet start-ups. Consequently, the company has had to overhaul its strategy in this business line. Management has decided to target larger companies, with more 'traditional' operations that intend to develop on the internet. This type of contract will allow the company to generate higher and recurring turnover per contract but will probably entail a heavier burden with respect to logistics and therefore take longer to develop. Because of its change in strategy, Cryo has given up its initial plan of outsourcing services related to selling SCOL licences to developers. It has now decided to keep on managing the customer relationship in-house because of the different type of client base it is now focusing on.

The company claims that 80 SCOL licences had been sold at 31 December 2000 and it has set up a network of 110 VARs. In 2000, sales broke down roughly into 55% in SCOL licences and 45% in online products. The proportion is likely to persist in the future.

Strategy: extend the distribution network for offline operations and develop Cryonetworks

As the company had indicated, H1 2000 saw a number of acquisitions to bolster the distribution network: a 62.25% stake in Dreamcatcher, a Canadian distributor specialised in the US, 91% of Homesoft, GT Interactive's former distributor in the Benelux, and 60% of German distributor Modern Games. Cryo is set to further expand its distribution network with an extension in Spain (open in January) and one in Scandinavia. In video game distribution, Cryo has acquired TAC, a French company that distributes games and makes accessories.

Going against this trend of building up its distribution network internationally, Cryo announced in early May the sale of its distribution capabilities in France to Wanadoo Edition. Cryo thus deprives itself of direct access to its domestic market which is also one of the three largest markets in Europe. This deal clearly has the advantage in the short term of offering a guaranteed sales volume of EUR10m for the current financial year and, in the long term, of reducing staff costs (the French distribution team numbered ten people). Nonetheless, besides the fact that the sale goes against the group's strategy, we think that in the long term this deal may have a negative impact on sales volumes, especially as Wanadoo has other games catalogues than Cryo's to distribute.

We forecast that the proportion of direct sales in the total will rise from 71% in 2000 to 75% at end 2001. Evolving markets and setting up the distribution network, notably in Europe, have taken longer than expected and therefore hurt margins in 2000. We believe the entire set-up will be operational during this year.

In 2000, the company adjusted its catalogue in three respects:

- It bought strong licences such as *Woody Woodpecker*, *Zorro* and *Zidane*.
- PC game development focused on new-generation consoles for which the first games will be released on PS2 this year. Management hopes thereby to rebalance its operations 50/50 between PC and consoles.
- Diversification in terms of type of product: Cryo is going to move from strategy games often located in a historic or fantasy world into sport-based games such as *Roland Garros* and *Zidane*, action games with *Universal Monsters* and games aimed at children like *Zorro* and *Woody Woodpecker* and games targeting adults such as *Dune* and *Atlantis III*.

At the beginning of the year, Cryonetworks acquired Vircom. The Canadian company, with 26 staff and 1999 sales of EUR1.9m, has like Cryonetworks one division dedicated to online games and another focused on technological R&D:

- Vircom has developed an online game called *The 4th Coming* that is played by 120,000 web surfers. The company is preparing a follow-up and another game called *Black Moon*.
- Vircom has also developed two internet tools: *VOP mail* is a web mail server designed for ISPs and corporations and *VOP Radius*, software for authentication over the internet.

In 2001, Cryo has therefore two priorities with respect to its offline business. It wants to optimise its distribution network and prove that it has the skills required to create various kinds of 'mass market' products. We believe the distribution network will be up and running in Europe at the end of this year. In the US, Dreamcatcher, with its staff of 30 (including 10 in sales) is too small in our opinion to have any real bargaining clout. The company plans to increase this team to a total of 35 persons at end-2001. This year Cryo also intends to develop into Asia with its online and offline operations.

Strengths

- Games set in a historic and/or legendary world and based on strategy enjoy a longer life cycle than action games. Cryo games have an average life span of slightly more than one year whereas action games last 3 to 6 months.
- Setting up a distribution network in the US and Europe will provide Cryo with direct access to retailers. We believe therefore that sale volumes will become far more significant as early as this year.
- Acquiring Vircom has rounded off Cryonetworks' development as well as online game divisions

Weaknesses

- Controlling a distribution network to be able to negotiate selling terms such as positioning on store shelves remains crucial for software makers. Cryo has understood it needs to have a distribution network covering all main geographical zones. But Cryo faces fierce competition as global players have already had their own network and have held in stock for several years. In addition, Cryo has lost direct access to its two main European markets of France and the UK.
- With SCOL, Cryonetworks is positioning itself on one of tomorrow's growth markets. Developing tools that allow 3D websites and 3D online games to be created is a promising business line. But competition is already fierce worldwide. Macromedia signed an agreement with Intel in July 2000 that led to a 3D rendering engine being included in the Shockwave player to create 3D online

environments. Several US companies such as Activ World and Metastream market competing products. The same is true of European companies such as Blaxuxun in Germany and SuperScape in the UK.

- Exposure to the current volatility in the internet market.
- Besides companies offering fairly similar products, the largest risk comes from standardised languages such as Java and VRML. Combining these two programming languages allows user to create the equivalent of what SCOL can offer.
- The company is not making a profit at the moment.

Outlook

Sales in the first quarter of 2001 (to end March) came in at EUR7.56m, up 143.5%. This good performance resulted from:

- Robust 95% organic growth on the back of sales posted in the US via the Dreamcatcher unit, which was already consolidated in the first quarter of 2000. A noteworthy point is that the group did not release any new offline products during this quarter.
- Additional 15% growth in Cryonetworks' business: but the pertinence of its first-quarter growth rate is questionable since the company only began operating really in September 2000.

According to the company, order intake stands at EUR19.8m. It reported it had signed several distribution contracts in Benelux, Germany, the US and Spain with Microid and Wanadoo.

On the other hand, Cryo has launched a cost-cutting plan that will lead to the following measures in the first half:

- The UK subsidiary will be turned into a marketing office.
- Cryo Studio North America in the US will be closed down.
- Cryo GmbH is being shut down - its operations have been merged into Modern Games.
- Overheads will be "reduced" in France, although no figures have been released.
- Staff restructuring will be implemented at a worldwide level, in order to keep staff at 380 persons by closing several offices and redeploying personnel in Europe and the US.

Cryo's catalogue should contain 40 offline products this year and the company intends to steady its production around fifty products from 2002. We forecast turnover will rise 45% to EUR72.6m over the year as a whole. The company expects business to grow by more than 50% and hopes to post an operating profit over the full fiscal year again, implying an operating loss in the first half. In 2001, the breakdown of products by platform, which was still dominated by the PC in 2000, should be 50/50. We remain very cautious with regard to Cryonetworks' sales because of the lack of visibility on the online market. We expect Cryonetworks' sales to remain stable at EUR7.2m in 2001, while Cryo projects EUR15m this year and EUR18m in 2002.

We expect the company to post an operating profit of EUR4.6m in 2001 against a EUR3.6m operating loss in 2000 and its net profit to come in at EUR0.3m against EUR10.2m in 2000. Applying US GAAP standards suggests the company will break even at operating level in 2003 (see tables on pages 7 and 8).

The integration of the distribution network and the steadier breakdown in offline revenues by platform should allow the company to enjoy a substantial rise in its operating profit in 2002. Net profit should grow to EUR4.6m in 2002.

With a delta close to 0.60, because of a recent appreciation in the shares, the likelihood that the Cryo Interactive 3% 2005 convertible will reach its conversion price has increased and remains above 50%. We therefore treat this convertible bond as quasi-equity.

Valuation

At EUR7.6, Cryo's EV/Sales ratios stand at 1.9x in 2002 and 1.6x in 2003 and are comparable to the sector's 1.5x and 1.2x medians in Europe. On the basis of these ratios, Cryo is nearly as highly valued as Ubi Soft whereas it is at an advanced stage of development.

Conclusion

Cryo's price remained above the sector's average for a long time, as the market hoped the company would post a better performance in 2000 because its product mix is dominated by PC software. Last year's data dashed such expectations. We believe the company needs to move from its niche market to a broader one. The strategic changes implemented from end-1999 onwards have been a step in the right way. The crucial question now consists in ascertaining whether the company can hope to have a place on a market undergoing consolidation where many players are already giants in relation to Cryo. If the present strategy is implemented successfully, in our opinion the company will be able to reach critical mass within three years. But Cryo must now simultaneously optimise its distribution network, diversify its catalogue in terms of type of product as well as platform to include the new consoles. We expect the company's presently strategy to begin to pay off in 2002. We are initiating coverage of Cryo with a **Hold** recommendation.

Key figures

Cryo

Enterprise value

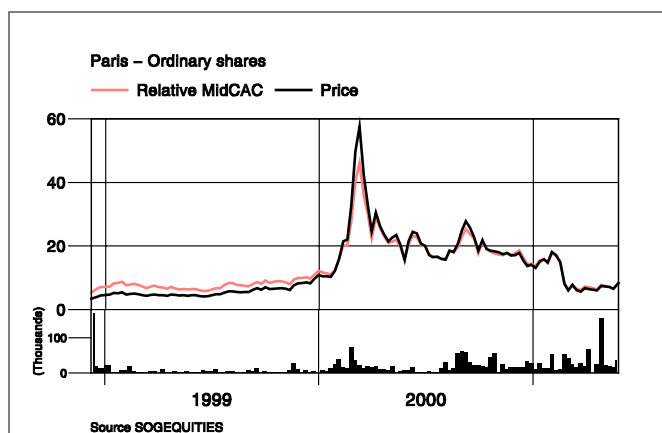
	EV/ Turnover	EV/ EBITDA	EV/ EBIT
2000	1.97	6.93	nm
2001e	1.32	4.56	20.73
2002e	1.07	3.53	13.91

Shares (000)

Daily trading volume	34,958
In issue	12,292

Potential shares (000)

Convertible bonds	1,557
Warrants	none



	Turnover (EURm)	EBITDA (EURm)	EBIT (EURm)	Operating margin (%)	Reported earnings (EURm)	ROE (%)	ROCE (%)
Hist peak (1999)				3.5			
1999	36	10	1	3.5	1	12.0	7.2
2000	50	14	-3	-5.9	10	39.3	-6.0
2001e	73	21	5	6.4	0	4.6	4.4
2002e	98	30	8	7.7	2	7.1	7.2
2003e	119	40	13	10.9	6	11.5	10.4

	Cash flow (EURm)	Capital expenditure (EURm)	WCR incr/decr (EURm)	Free cash flow (EURm)	Net debt (excl. conv.) (EURm)	Gearing (%)	Interest cover (x)
1999	10	10	6	-5	16	118.9	8.3
2000	29	18	9	2	6	12.3	nm
2001e	19	22	7	-10	1	2.3	11.6
2002e	27	26	8	-7	9	13.8	18.8
2003e	35	33	7	-5	14	19.5	32.2

2000 sales breakdown by region

Europe	35%
North America	25%
France	35%
Asia	4%

Shareholders split

	%
JM Lefranc	24.26
Markas Holding BV	16.44
JP Hulrich	12.60
R Huberlot	5.19
F Fries	1.44
Other	1.07
Free float	38.98

Eidos

Europe
United Kingdom

HOLD

Video games

May 2001

Uncertainties remain

Price at 23/05/01

298p

FTSE All Share 23/05/01

2,858

Market capitalisation

£308m

\$439m

Value of free float

£283m

Reuters

EID.L

- **Eidos, the UK software publisher known for the success of its *Tomb Raider* series, is now in a difficult position.** With some 20 products including several for the PS2, Eidos postponed four product launches from its third financial quarter (Oct-Dec 2000) until Q4 (Jan-Mar 2001). Eidos also announced that it was postponing 7 products from Q4 until the next financial year (3 PC games in Q1, 1 PC game and 2 PS2 games in Q2, and 1 PS2 game in Q3 2002). After issuing a profit warning in February, the company reported a loss for the financial year to 31 March 2001.
- **Bringing product development back in-house** requires increasing the number development teams and optimising them so as to control costs.
- We are looking for turnover to decline 15% to £165.8m in FY2000/01 and to rise 4% to £172.1m in 2001/02. We are projecting operating losses of £13.8m in 2000/01 and £0.1m in 2001/02.
- **Despite the failed takeover of Eidos by Infogrames last summer, uncertainties over Eidos's sustainability and independence persist.** Eidos's weak fundamentals make it an ideal target for a publisher seeking to add quality products with strong franchises to its catalogue. With this in mind, Infogrames, along with the large US publishers, are potential predators.
- **We initiate coverage of the company with a Hold recommendation.**

Analyst

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	Pre-tax profits (£m)	Tax rate (%)	EPS (Adj) (p)	P/E	P/E relative	Cash EPS (p)	Price/Cash EPS	Net dividend (p)	Gross yield (%)
1999	63		1.110	nm		-0.270	nm		
2000	-73		-1.200	nm		-0.700	nm		
2001e	-3		-0.029 *	nm		-0.029	nm		
2002e	24		0.160 *	nm		0.160	nm		
2003e	39		0.260	nm		0.260	nm		

*-0.18 & 0.14 after depreciation of goodwill

High/low 12 months (p)	590 - 156	Performance in %	1 mnth	3 mnth	12 mnth
Price/book value 2000	892.68	Ordinary shares	41.7	16.7	-0.2
Dividend cover 2000	nm	FTSE All Share	1.3	-0.6	-1.6

Profile

Created in 1990, Eidos started as a development studio. In 1995, it acquired three companies and entered the games software publishing business. Known for the success of its *Tomb Raider* series, Eidos is now in a difficult position. Until 2000, Eidos was in charge of publishing many Japanese products from publishers such as Capcom or developers such as Square Software. Eidos is now operating at a loss and the *Tomb Raider* series is showing signs of losing steam. The failed attempt to sell the company last summer and the change of management is not good news.

Eidos now has 530 employees, 300 of them in R&D. It owns stakes in many external studios. In 1999, it produced 90% of its output through its own studios, including Ion Storm, Proein and Pyro. The company does not have its own distribution network. It sells its products worldwide. It derives 40% of sales from the US and 60% from Asia and Europe, including 27% from the UK.

Strategy: To refocus R&D and move out of publishing third-party products

The company's main weakness is poorly controlled product development. For several years, Eidos has failed to meet its initial release schedules and its products have missed out on the year-end holiday season. Eidos has around 20 products, including several for the PS2. It delayed the release of four products from its third financial quarter (Nov-Dec 2000) until Q4 (Jan-Mar 2001). Eidos also announced that it was postponing 7 products from Q4 until the next financial year (3 PC games in Q1, 1 PC game and 2 PS2 games in Q2, and 1 PS2 game in Q3 2002). After issuing a profit warning in February, the company reported a loss for the financial year to 31 March 2001.

Since sales are highly seasonal, postponing launches results in lost income that will be even more difficult for Eidos to make up because its catalogue contains only a limited number of titles. The quality of many Eidos products is above average and it sells several hundred million copies of certain games thanks to its strong licenses, but the company does not have good control over product development. Eidos's goal is to bring product development back in-house and to minimise the amount of development performed by external studios, as controlling the production process is more difficult in that case.

Until 1999, Eidos generated a not insignificant portion of its sales from re-issuing foreign products in Europe, and particularly from contracts to re-release Square and Capcom products. These contracts gave the company higher sales volume and a broader catalogue. Today, Eidos no longer has any contracts for publishing third-party products. It has decided to refocus on its in-house product development business, which is easier to control and is not as volatile, according to management. We think that the development control problems that Eidos has encountered for over two years have spilled over to the re-release business and that Eidos gradually lost these contracts. As a result, we think the company is now overstaffed, with 230 employees working in publishing, marketing and administration.

Reorganisation of R&D. Bringing product development back in-house requires increasing the number of development teams and minimising their cost. Until 1999, 90% of products were developed by external studios. This year, this percentage is expected to be reduced to 35% and the company's goal is eventually to bring it down to 20%. Eidos currently owns five in-house studios, which are specialised by game category. They comprise some 15 development teams:

- Crystal Dynamics
- Core
- Proein
- Ion Storm
- One studio in Los Angeles

Thus, the company's development teams are now better balanced with an R&D department of 300 people and a network of 320 external developers.

The *Who Wants To Be a Millionaire?* and *Lara Croft* effect

Eidos acquired this licence for about 20 countries. As in the case of *Pokemon*, this license was the best-seller for several weeks. This type of product, which requires a modest development budget and offers substantial sales potential, generates much higher profits.

Even though *Tomb Raider* is showing some signs of losing steam, the game is still one of the most successful blockbusters in the sector, with combined sales of over 15 million units for all titles in the series. If the film, to be released in the near future, meets with success, this licence could generate substantial additional revenues in the form of royalties.

Strengths

- Strong licences and franchises, allowing the company to generate high unit volumes and a higher gross margin than its competition.
- No fixed costs associated with a distribution network, which increases the gross margin.
- High-quality development teams.
- Substantial investment in marketing.

Weaknesses

- Lack of control over development times, which increases costs and lowers sales potential.
- Limited number of titles.
- Critical size not yet reached.
- High level of dependence on external studios: 19 of the 26 products created during FY1999/00 were developed by independent studios.
- The shares' dual listing on the Nasdaq, which increases exposure to the US market.
- Lack of distribution network prohibits direct access to markets.

Outlook

Sales for Q3 2001 (Oct-Dec 2000) were £83.5m for 8 products, including the hit *Who Wants To Be a Millionaire?* with over 1 million units sold in the UK. Eidos initiated a cost-cutting plan which trimmed operating expenses by 14% compared with Q3 1999/00. But this reduction did not offset the downturn in sales. The operating margin (before goodwill amortisation) narrowed to 22.4% from 29.5% in Q3 1999/00.

Eidos derives 40% of its turnover from PC games and 60% from console games. This puts it in an excellent position to benefit from the new generation of consoles. But the company is highly dependent on the period of transition towards this new generation and therefore on the rate at which the installed base of PS2 and X-Box will build up. Eidos has opted to steer clear of the GameCube as it does not consider its catalogue to be consistent with a children's console.

The company plans to launch 29 products in FY2001/02, compared with 36 during FY2000/01, for all platforms excluding the Nintendo:

Breakdown of titles by platform, FY2001/02

	Number of titles
PS2	11
PC	10
X-Box	5
Dreamcast	2
Gameboy Advance	10
PSOne	1

Source: Company data

But management says that some product launches will again be delayed in 2001 and that new profit warnings are to be expected, as the R&D reorganisation is not complete. Against this backdrop, it appears difficult to predict the company's sales, particularly if the releases to be postponed are products with strong potential. Indeed, if a promising title that was to be launched in the fourth calendar quarter, which includes the year-end holiday season, is ultimately released only during the following quarter, it loses some of its sales potential. Under these circumstances, we find it difficult to give much credence to management's forecast.

We are looking for sales to decline by 14% to £165.8m in 2000/01, and then to recover by 4% to £172.1m in FY2001/02. On our estimates, Eidos will generate operating losses of £13.8m in FY2000/01 and £0.1m in FY2001/02.

Valuation

The company's EV/Sales and EV/EBITDA multiples for 2002 and 2003, calculated according to US GAAP standards, are below the medians of its European peers. Even so, we think Eidos is fairly valued at 297.5p per share, given its profile as a publisher without a distribution network, the limited number of titles in its catalogue and the reorganisation currently underway.

Conclusion

We remain cautious as to the product release schedule. Postponements are still a possibility for the 2001/02 financial year.

Last summer's failed bid to sell the company to Infogrames does nothing to change our belief that the company cannot remain independent and that it is an ideal takeover target for a publisher seeking to add high-quality products with strong franchises to its catalogue.

We initiate our coverage of Eidos with a **Hold** recommendation.

Key figures
Eidos
Enterprise value

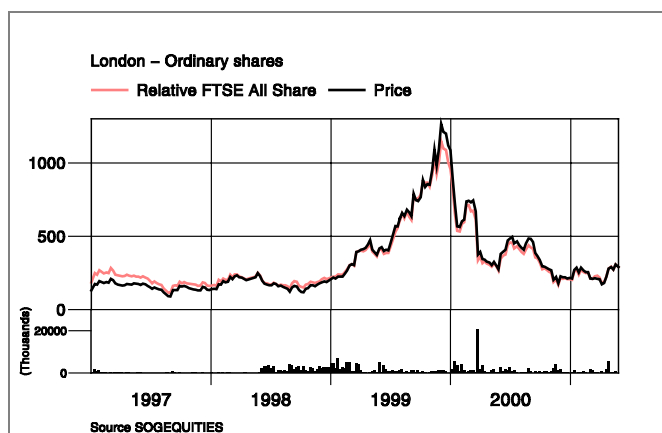
	EV/ Turnover	EV/ EBITDA	EV/ EBIT
2000	1.94	nm	nm
2001e	1.92	nm	nm
2002e	1.51	13.36	13.36

Shares (000)

Daily trading volume	1,257.4
In issue	103,400

Potential shares (000)

Convertible bonds	none
Warrants	none



	Turnover (£m)	EBITDA (£m)	EBIT (£m)	Operating margin (%)	Reported earnings (£m)	ROE (%)	ROCE (%)
Hist peak (1999)				-6.9			
1999	195	-13	-13	-6.9	25	134.8	-8.7
2000	166	-14	-14	-8.3	-92	-175.2	-11.6
2001e	172	0	0	-0.1	-20	-9.0	-0.1
2002e	215	24	24	11.3	15	40.8	10.5
2003e	280	39	39	13.7	28	43.8	16.2

	Cash flow (£m)	Capital expenditure (£m)	WCR incr/decr (£m)	Free cash flow (£m)	Net debt (excl. conv.) (£m)	Gearing (%)	Interest cover (x)
1999	-28	4	24	-56	-23	-20.0	nm
2000	-77	4	-4	-76	54	147.7	nm
2001e	-3	5	1	-9	62	187.6	nm
2002e	17	5	7	5	57	113.2	nm
2003e	28	0	10	18	39	49.2	nm

Geographic sales breakdown 9 months 2000 (to 31 Dec)

Europe	60%
US	35%
Rest of the World	5%

Shareholders split in 2000

Management	3%
Other	5%
Free float	92%

Infogrames Entertainment

Europe
France

HOLD

Video games

May 2001

The reorganisation continues

Price at 23/05/01

EUR23.0

MidCAC 23/05/01

2,540

Market capitalisation

EUR1,838m

\$1,571m

Value of free float

EUR1,255m

Reuters

IFOE.PA

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- **Infogrames Entertainment is the European leader and was ranked in the top 5 worldwide in 2000. We consider it be the major operator in the video games sector in Europe** in terms of size and in view of the aggressive strategy it has been conducting on a world scale since 1998. The acquisition of GT Interactive at the end of 1999 gave the company new stature. It is now established internationally and has a worldwide distribution network. The recent acquisition of Hasbro Interactive has reinforced its catalogue with mass-market products.
- **Following the reported sales of EUR139.5m (+12%) for Q3 2000/01 (Jan-Mar 2001), we have revised down our FY2000/01 sales forecast** from EUR766.8 to EUR719.8m, lowering annual growth from 47% to 38%. We are therefore maintaining our estimates of the operating and net losses before goodwill at EUR42.2m and EUR39.7m respectively for FY2000/01.
- **In FY2001/02, we are looking for sales to expand 23% to EUR945.4m.** The reorganisation of the distribution network in Europe and the refocusing on the main countries should start bearing fruit as of the next financial year, with projected operating profit of EUR40.7m, an operating margin of 4.3%, and net profit before goodwill of EUR41.2m.
- **Our DCF valuation comes to EUR25.7 per share.** In view of 2002 and 2003 EV/sales of 2.1x and 1.7x respectively, we think Infogrames is now fairly valued. We maintain a **Hold rating**.

	Reported earnings (EURm)	EPS (Adj) (EUR)	P/E	P/E relative	Cash EPS (EUR)	Price/Cash EPS	Net dividend (EUR)	Gross yield (%)
1999	-28	-0.15	nm		-1.63	nm	0.00	0.00
2000e	-57	-0.34 *	nm		-0.27	nm	0.00	0.00
2001e	21	0.29 *	78.1	5.10	0.55	41.9	0.00	0.00
2002e	68	0.62 *	37.2	3.19	1.04	22.2	0.00	0.00
2003e	57	0.76 *	30.3		0.71	32.2	0.00	0.00

EPS trend 1999-2003: nm

*-0.55 & 0.20 & 0.65 & 0.55 after depreciation of goodwill

High/low 12 months (EUR)	34.8 - 14.3	Performance in %	1 mnth	3 mnth	12 mnth
Price/book value 2000	7.26	Ordinary shares	14.8	35.0	-21.5
Dividend cover 2000	nm	MidCAC	5.6	2.8	1.3

Profile

Infogrames, a French publisher, develops, publishes and distributes its own games as well as those of third parties. It is the European leader in the sector and was ranked among the top 5 publishers worldwide in 2000. The acquisition of GT Interactive in October 1999 and of Hasbro Interactive in early 2001 made Infogrames a major operator in the sector, by completing the construction of its distribution network, reinforcing its position in the US, and diversifying its catalogue by genre, price category and platform. Infogrames hopes to become a publisher of mass-market software for a global target audience.

Strategy

With GT Interactive, Infogrames now owns large development studios in France, the UK, Australia and the US. With its teams, Infogrames plans to develop 120 products in-house in FY2000/01, or 40% of its catalogue. The remaining 60% is developed by external studios. We observed the beginning of a recovery by GT Interactive in H1 2000/01 (the six months to end Dec 2000). In fact, the loss in H1 2000/01 of EUR12.4m compares well against the loss of EUR73.6m of H1 1999/00 (including GT) and this year Infogrames Inc. posted a positive net result in Q2.

This recovery is due to:

- The use of the Infogrames distribution network in Europe for GT products.
- The closure of several US sites and the merger of several GT entities with Infogrames North America.
- The outsourcing of distribution logistics: total logistical costs fell from 13% to 7% of sales in H1, and should settle at 3% to 4% in the coming quarters.
- The implementation of a production management systems which helped control costs and above all product development time.

Infogrames has a worldwide distribution network. Its strategy now focuses on bolstering its catalogue and therefore its R&D teams. Through its latest issue of High Trigger Equity Convertible bonds, the company raised EUR370m, giving it the wherewithal to continue its aggressive policy of growth by acquisition both to reinforce its production teams and to acquire strong licenses and develop its new subsidiary Infogrames.com. Infogrames plans to invest EUR200m in this company, which was created at the beginning of the year and will combine the following businesses:

- Internet: development of online content;
- Portable: content for all terminals that can be connected to the Internet, such as Palm Pilots;
- Broadband: content for interactive TV;
- In transit: content for specific media, such as games on board aeroplanes, cars or trains;
- Applications for mobile telephones.

Infogrames' strategy is clear: It aims to supply interactive leisure content for all types of media.

Strengths

- GT Interactive's management has been in place since the first calendar quarter of this year under the responsibility of Infogrames' CEO. Infogrames' management has repeatedly demonstrated a solid ability to respond through a clearly defined strategy.
- Infogrames' position as world challenger gives the company substantial growth potential. The war is not being waged only among console manufacturers, and the trend to consolidation has been waxing over the past three years on a market in transition. We think Infogrames stands to benefit from it.
- Infogrames is expected to reinforce its catalogue in sports, one of the largest product segments.
- Infogrames' strengths lie in its control over its distribution network and in the diversification of its catalogue by platform, genre and price category.

Weaknesses

- Integrating the information systems is the next important step and is not to be missed. The most difficult part will not be combining the billing systems, but rather integrating the two companies' development teams and the internal tools specific to each of their studios. This is a critical project and Infogrames expects to complete it before the end of the year.
- Is Infogrames lagging behind its rivals in online games for the new platforms? If we compare Infogrames to Electronic Arts, the answer is "yes", because the US publisher is very active in online games and was the front-runner in this business with *Ultima Online*. However, what is important is to determine whether Infogrames is behind relative to the development of online and other future platforms, such as interactive TV. We do not think so. Online gaming is only in its infancy and it is not a profitable business. Infogrames is expected to announce the signature of many agreements and the development of content through its subsidiary Infogrames.com before the end of this year.
- Now that it has become the world leader's main rival, Infogrames will have to strive to bring the quality of its products into line with those of Electronic Arts. This is something to watch for in Infogrames' forthcoming products, especially those developed for the new generation of consoles.
- The convertible bonds:
 - 1.5% Infogrames convertibles maturing in 2004: Because these convertibles were issued last year, before the plunge in stock prices in the sector, the delta is very low at the moment, at around 0.42. Hence, the probability that they will be converted seems low to us, at around 50%.
 - 1% Infogrames convertibles maturing in 2005: Unlike the 2004 bond, the delta for the 2005 bond is over 0.96, hence the probability that it will reach its conversion price is very high.

Outlook

The improvement in group performance in H1 2000/01 comes from Infogrames Inc. with the beginning of a recovery in US operations following the integration of GT Interactive. In the first half of FY2000/01, the company narrowed its operating loss to EUR12.4m from EUR73.6m in the first half of 1999/00 (including GT). This year, in the second quarter, Infogrames Inc. posted positive net earnings.

In Europe, growth in H1 2000/01 was 1%, and this region accounted for 42% of turnover. In the second half (6 months to June 2001), Europe is expected to generate a higher percentage of sales owing to:

- The Hasbro catalogue. Hasbro, which has been consolidated as from February, brings in a catalogue of 250 titles and 15 new releases a year. The entity generates over 50% of its turnover from the 'back catalogue'. In February, Hasbro's turnover was US\$7m, generated entirely by distribution of existing titles in Europe, before Infogrames had time to set up a specific marketing policy for these products;
- The release of six PS2 products in Europe.
- The high proportion of revenues generated by certain titles in distribution, such as *Final Fantasy IX* (600,000 copies sold in a month) or *Unreal Tournament*, to be released in Europe for the PS2 next month. Potential revenues for 1.2 million copies of *Final Fantasy IX* come to EUR36m, or roughly 18% of estimated total turnover in Europe for the second half of 2000/2001.

At the moment, the company is having trouble estimating the potential of Hasbro products, but based on figures for the month of February, it should be higher than initially forecast. We have therefore increased Hasbro's turnover contribution for the current year from EUR44m to EUR51m. As part of the assimilation process, Hasbro is being restructured at all levels, more specifically via the following actions:

- The sale of its two European units, Leisure Soft and Europress;
- The closure of administrative and logistics departments that were redundant with Infogrames Inc.'s existing structure;
- The closure and repatriation of certain development studios;
- Reduction in the workforce dedicated to games.com from 140 to 10 employees, which has helped cut the investment programme from US\$60m to US\$10m.

The restructuring costs associated with Hasbro's integration are now estimated at EUR18m. They will be booked either to exceptional items or to the opening balance sheet.

We expect turnover for the second half of FY2000/01 to be boosted by higher revenues from third-party product distribution, such as those generated under the agreement to sell a number of Square Soft products in Europe. Nonetheless, following the reported turnover of EUR124.3m for Q3 2000/01 (Jan-Mar 2001), we revised down our FY2000/01 sales forecast from EUR766.8 to EUR719.8m, lowering annual growth from 47% to 38%. This cut follows the delays of several products including Digimons. We consider that Infogrames is capable of streamlining its operating costs to make up for these shortfalls, which are a normal part of the video game business. We are therefore maintaining our estimates of the operating and net losses before goodwill at EUR42.2m and EUR39.7m respectively for FY2000/01. The impact from the increase in this lower-margin business should be offset by a product mix that is more favourable to the PC medium thanks to the Hasbro and GT products. We estimate the gross margin at 50.8%. The company is expecting over 10 titles, with more than 500,000 copies sold this year. For FY2000/01, we are looking for turnover of EUR766.8m, an operating loss of EUR42.2m, and a net loss before goodwill of EUR37.4m.

For FY2001/02, we expect sales to rise by 23% to EUR945.4m. The reorganisation of the distribution network in Europe and the refocusing on the main countries should start to bear fruit as from next year. We project operating profit of EUR40.7m and an operating margin of 4.3%. Lastly, we estimate net profit before goodwill at EUR41.2m.

For FY2002/03, we are looking for turnover to expand 35% to EUR1,276m, for the operating margin to widen by 2.8 percentage points to 7.1%, for operating profit of EUR90.2m, and for net profit before goodwill of EUR87.7m.

Valuation

Our discounted cash flow model gives a valuation of EUR25.7 per share.

DCF model

EURm	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Cash flow from operations	-31	59	83	99	130	172	215	245	270	285
Capital expenditure	25	31	38	45	62	51	57	59	60	65
Change in WCR	37.7	42.9	63.0	48.6	85.0	89.0	81.0	69.0	51.0	48.0
Free cash flow from operations	-93	-15	-18	5	-17	32	77	117	159	172
Discount rate	7.1%									
Sum of DCF	184									
Perpetual growth rate	4.0%									
Discounted terminal value	2,878									
Enterprise value	3,062									
(-) debt	414									
(+) long-term investments	16.5									
(-) minorities	3.1									
Equity value	2,662									
Number of shares (m)	103.5									
Value per share	25.7									

Source: SG Cowen estimates

WACC calculation

EURm	
Shareholders' equity 01	330.4
Net debt 01	413.9
Net debt + shareholders' equity	744.3
ND/(ND + SE)	56%
SE/(ND + SE)	44%
10-year OAT yield	5.20%
Market risk premium	4.10%
Beta	1.45
Cost of equity	11.1%
Interest rate on debt	6.0%
Tax rate	35%
Net cost of debt	3.90%
Weighted average cost of capital	7.12%

Source: SG Cowen estimates

The EV/Sales multiples are 2.1x for 2002 and 1.7x for 2003. The median for the European companies (excluding developers) is 1.9x for 2002 and 1.5x for 2003. Hence, Infogrames carries a premium because of its leadership position in Europe. In our opinion, because of its size, Infogrames is more comparable to world leader Electronic Arts. The company's multiples of 4.2x for 2002 and 3.1x for 2003 compare with medians of 1.8x and 1.5x for the US companies. The EV/EBITDA multiples for 2002 and 2003 are 35.6 and 22.5 for Infogrames, vs. 29.8 and 19.2 for Electronic Arts. Hence, Infogrames is more expensive than the leader. Furthermore, we do not think that Electronic Arts's premium is warranted given the prevailing climate in the sector. We believe Infogrames is fairly valued.

Conclusion

The completed integration of GT Interactive and its return to profitability during the 2001 financial year and the end of the transition period set for 2002 should put Infogrames in a position to benefit fully from the 2002 financial year. Infogrames is trading on EV/sales of 2.1x for 2002 and 1.7x for 2003 and a P/E of 43.8x for 2002 and 28.6x for 2003. After a sharp correction in the share price over the past year, we think that it has bottomed out at EUR15. We think that in the short term it could suffer from negative newsflow as the company announces H2 2000/01 figures which are likely to show a continued slowdown in sales of PSONe products and the limited installed base of new-generation consoles. In the medium term, we expect an improvement in visibility, strengthening our confidence for the long term.

We maintain our **Hold** recommendation.

Key figures
Infogrames Entertainment
Enterprise value

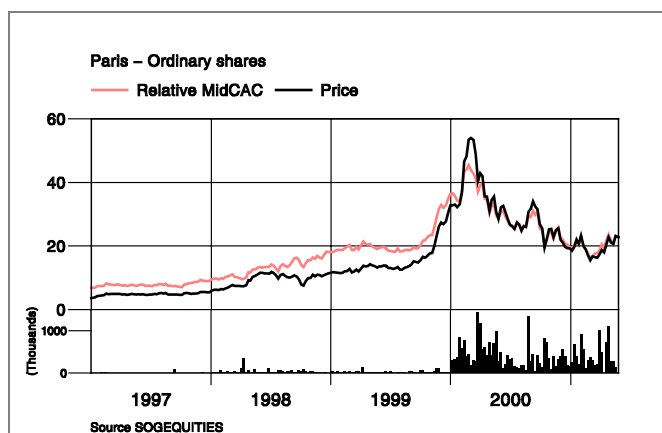
	EV/ Turnover	EV/ EBITDA	EV/ EBIT
2000e	3.11	nm	nm
2001e	2.26	52.51	52.51
2002e	1.86	26.31	26.31

Shares (000)

Daily trading volume	353,846
In issue	80,093

Potential shares (000)

Convertible bonds	15,810
Warrants	4,579



	Turnover (EURm)	EBITDA (EURm)	EBIT (EURm)	Operating margin (%)	Reported earnings (EURm)	ROE (%)	ROCE (%)
Hist peak (1994)				15.2			
1999	522	-47	-47	-9.0	-28	-10.4	-4.1
2000e	720	-42	-42	-5.9	-57	-15.2	-5.3
2001e	945	41	41	4.3	21	6.7	4.3
2002e	1,276	90	90	7.1	68	11.2	7.9
2003e	1,532	112	112	7.3	57	12.5	4.9

	Cash flow (EURm)	Capital expenditure (EURm)	WCR incr/decr (EURm)	Free cash flow (EURm)	Net debt (excl. conv.) (EURm)	Gearing (%)	Interest cover (x)
1999	-156	114	27	-297	391	205.9	13.1
2000e	-28	157	38	-222	414	126.5	14.1
2001e	57	206	43	-193	312	62.7	nm
2002e	107	278	63	-234	554	98.0	nm
2003e	74	334	49	-309	863	138.7	nm

Sales breakdown 1999/00

Europe	47%
United States	43%
ROW	10%

Main shareholders

Interactive Partners	21.9%
Azéo	6.0%
Dassault Multimedia	2.4%
Public	69.0%
Grey Phantom Ltd	0.7%

Kalisto Entertainment

Europe
France

SELL

Video games

May 2001

Ability to find further funding to be verified

Price at 23/05/01

EUR2.0

MidCAC 23/05/01

2,540

Market capitalisation

EUR35m

\$30m

Value of free float

EUR18m

Reuters

KLST.LN

Analyst

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- **Kalisto designs and develops games software for PCs and both established and new-generation consoles.** Recently it has focused part of its development teams on online business, but Kalisto now plans to refocus on its historical activity and safeguard business by signing development contracts with publishers. Kalisto will have to use these contracts to demonstrate its quality as a developer and prove it has not lost client confidence.
- **When Kalisto released 2000 sales of EUR2.9m versus the expected EUR25.9m, this had a major impact on the market** and seriously damaged the company's credibility. This, in our opinion, will be hard to repair.
- **We estimate 2001 sales of EUR15.7m (up 450%) and 2002 sales of EUR22.0m (up 40%).** In addition to offline activities, these figures factor in only the web-based game sales in online activities. We think that steps taken to limit charges will stabilise expenses in 2001 and reduce them in 2002. We estimate operational losses of EUR8.3m in 2001 and EUR4.3m in 2002.
- **In the short term, the company's sustainability will depend on its refinancing capacity** with a credit line of EUR20m due to be reimbursed by June 2001.
- **Since the publication of its 2000 sales the share price has fallen 94%.** We think the decline is likely to continue since Kalisto has not yet found any new partners. In this context we are initiating our cover on Kalisto Entertainment with a **Sell rating**.

	Reported earnings (EURm)	EPS (Adj) (EUR)	P/E	P/E relative	Cash EPS (EUR)	Price/Cash EPS	Net dividend (EUR)	Gross yield (%)
1999	2	0.079	25.5	0.65	0.150	13.60	0.00	0.00
2000	-28	-1.290	nm		-1.170	nm	0.00	0.00
2001e	-9	-0.420	nm		-0.250	nm	0.00	0.00
2002e	-5	-0.210	nm		-0.024	nm	0.00	0.00
2003e	2	0.074	27.5		0.280	7.14	0.00	0.00

EPS trend 1999-2003: -1.8%

	High/low 12 months (EUR)	Performance in %	1 mnth	3 mnth	12 mnth
Price/book value 2000	23.1 - 0.6	Ordinary shares	-3.3	-78.1	-88.8
Dividend cover 2000	nm	MidCAC	5.6	2.8	1.3

Profile

Kalisto develops games software for PCs and both established and new-generation consoles. Two thirds of its business comes from various types of universe games for which it has a dedicated design team. This division is made up of adventure, racing, RPG and strategy games. The remaining third of sales are generated by action games. Kalisto currently has a workforce of 290.

The K Platform – a productive R&D system

The purpose of this platform is to reuse as many tools as possible, thereby cutting development costs and reducing development time. This concept is based on proprietary architecture on which tools that are needed to create a game – developed both in-house and externally – are then added. These tools are the 3D motor, the compilers, kinematics, etc. In this way, developers do not have to develop specific tools for each type of platform. Though all the big publishers have these types of tools, developers do not, which puts Kalisto well ahead of its rivals in this area.

At present, this platform only reduces production time in porting a game from one platform to another or in developing follow-ups to games that already exist. In the long term, however, the system should make tools more profitable when more games are being developed.

Own productions

These are products that are developed and produced solely by Kalisto, which finances the entire development process. When the sales contract for a product is signed – generally about two thirds of the way into the development process – the two parties define a global sum for each product that they then split between the advance payment made at the time of the signing and subsequent instalments, which are generally paid in the final development stages. In 2000, Kalisto aimed to sell seven offline games, however, given market conditions (insufficient Dreamcast sales, slowing in PSOne games sales and a low installed PS2 base), publishers have cut back on external purchases.

In our opinion, there is another reason for this failure. Kalisto has developed big-budget higher-end games that consequently sell at high prices and some products have not sold. Now the question is whether Kalisto can sell them this year in a still difficult market context.

Development contracts

At present Kalisto develops four products on behalf of publishers. The publisher comes up with the project and finances its development from the outset.

Online business

Kalisto's online activity consists of producing different types of internet products:

- **Web-based games:** these are small products developed in one man-month with budgets of between EURO.1m and EURO.6m. They are either purchased outright by ISPs or rented for a fixed period. Kalisto, which developed forty of these games last year, plans to develop as many this year and start marketing them.
- **Multiplayer games** like *Highlander*

- *U-Race* technology developments. These enable virtual participation in sports events as gamers can play while events are actually going on (races in particular). Kalisto plans to sign a contract with an ISP that is estimated at EUR100m over five years to cover the price of the licence and development of several products. Currently, the company is trying to industrialise a product developed by R&D. However, until it has demonstrated the potential of this type of product by signing a contract with an ISP, there is no point in estimating the real potential or integrating it into our business model.

Strategy: selling content on all platforms

Kalisto's business is developing games software. Its objective is to be capable of creating content for any platform: television, mobile phones, cinema and the internet. Given the present situation, Kalisto is now concentrating on developing offline games. The seven original productions that were due to be sold in 2000 still have no takers. In 2001, a minimum of EUR7m in sales is guaranteed thanks to four products developed on behalf of publishers. Seven own productions are currently in the development process, of which one is being co-financed with Fox Kids. Two own productions will be delivered in 2001.

We think that Kalisto will continue to sign development contracts with publishers in order to safeguard business but will not give up its online projects.

Strengths

- Strong expertise.
- Long experience in developing higher-end products.

Weaknesses

- The risk of going bankrupt if a refinancing solution is not found by June 2001.
- Offline products (2/3 of 2001 sales) may not sell and this would have an impact on both sales and cash flow. This also raises doubts as to whether the business can continue to be viable.
- The limited number of products.
- Kalisto will continue to have only a small number of clients particularly if it sells its products as a package to the same publisher.
- It is risky for a development studio to depend on a publisher/distributor. When the developer wishes to make choices, it will be restricted by the publisher's sales volumes based on its sales capacity and that of its distribution network.

Outlook

When Kalisto released 2000 sales of EUR2.9m versus the expected EUR25.9m this had a major impact on the market and seriously damaged the company's credibility. This, in our opinion, will be hard to repair

The original sales estimate broke down into EUR16m from offline activities (of which EUR9.1m from development contracts and EUR6.9m from own productions) and EUR9.9m from online activities.

The company says that the difference between forecast and reported sales results partly from a project for an online contract that never came to fruition and partly from the catalogue of seven offline own-development products for which there have been no takers. We think that the figure of EUR25.9m was originally based almost exclusively on offline products. The transition started in 2000 prevented

Kalisto from selling its catalogue of products whose higher-end positioning did not match demand from publishers looking for low-cost products to round out catalogues.

Q1 2001 sales stood at EUR5m, in line with the company's estimates at the publication of 2000 results. Sales were generated essentially from own-production business, which contributed EUR4m, and the balance came from both advance payments from publishers for ongoing developments and the sale of around a dozen small web games to France Telecom as part of *The Race*.

Kalisto aims to sell its seven offline products before the end of May as a package to one publisher. This will reduce the average unit price and consequently the margin. We estimate the price of the package at between EUR7.6m and EUR12.1m. Daylight, the US studio Kalisto acquired in 2000, was consolidated in December 2000. At present, Daylight is developing three products under contract and is expected to contribute around EUR6m to 2001 sales.

Kalisto plans to offer services to make its audio/video department in charge of cinematic development with its staff of around fifteen a profitable entity.

Kalisto has launched a cost-cutting plan by:

- cutting down on non-productive staff,
- reducing R&D investments,
- outsourcing part of its logistics,
- closing down foreign offices in Shanghai, London and Tokyo.

We estimate sales of EUR15.9m (up 450%) and EUR22.3m (up 40%) in 2001 and 2002 respectively. In addition to offline activities, these figures factor in only the web-based game sales in online activities. We think that steps taken to limit charges will stabilise expenses in 2001 and reduce them in 2002. We estimate operational losses of EUR15.6m in 2001 and EUR3.2m in 2002.

In the short term, whether the company can stay in business or not will depend on its refinancing capacity. After its capital increase was postponed last summer, Kalisto obtained a credit line of EUR20m from a banking syndicate that is due to be reimbursed by end-June 2001. Under present circumstances, Kalisto cannot meet this commitment and needs either to find a partner that can replace the syndicate or negotiate a debt rescheduling. The first solution remains a possibility, but the second is, in our opinion, fairly unlikely.

We think the company should have notified the market of the situation in its offline activity as early as the beginning of Q4 2000. Instead, Kalisto confirmed its forecasts at the analysts' briefing of 13 December 2000. It has now lost the confidence of the market at a time when it needs to recapitalise by around EUR9m, reimburse debts of EUR20m and has annual working capital requirements of between EUR20m and EUR25m according to our estimates.

Valuation

Since Kalisto is a developer, its principal asset is its R&D. This is difficult to value, however, given that, even if a recovery is possible, its development teams are not captive. Neither does Kalisto own the *K Platform* or the *U-Race* technology (previously known as Sportners), which has not yet proved itself since the company has not sold any licences or development contracts to date.

The most comparable profile with Kalisto is that of Phenomedia. A comparison of 2002 and 2003 EV/sales ratios shows a very small gap between them with Kalisto at 2.9x in 2002 and 2.0x in 2003 compared with 3.0x in 2002 and 2.2x in 2003 for Phenomedia. Given Kalisto's position, we think that its valuation level is not justified.

Conclusion

We estimate Kalisto's financing requirements at between EUR50m and EUR55m to cover its recapitalisation, reimbursement of its credit line and working capital requirements. For the moment, two undesirable scenarios can be envisaged:

- **An industrial or financial partner acquires a shareholding.** An industrial partner is unlikely to be from within the sector, but more likely to be an internet player with a long-term project in which content (and notably games) has a major place. A financial investor capable of recapitalising the company would wish to come in as low as possible in order to generate capital gains in the medium term.
- **No acquirer is found and the company goes bankrupt.** Following the publication of its 2000 sales the share price shed 87% of its value. We think it likely that this slump will continue since Kalisto has not yet found any new partners. In these circumstances, we are initiating our cover of Kalisto Entertainment with a **Sell** recommendation.

Key figures
Kalisto Entertainment
Enterprise value

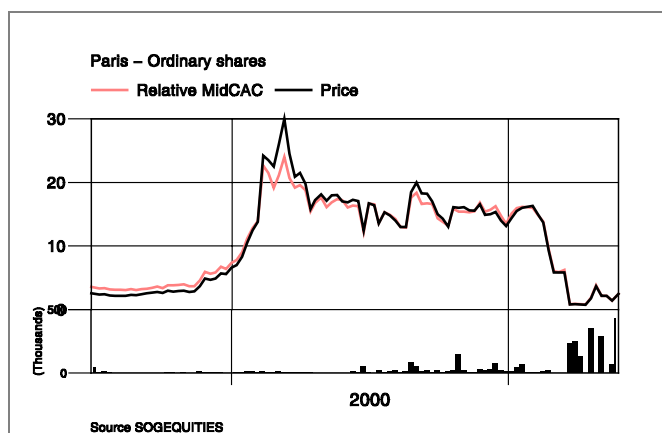
	EV/ Turnover	EV/ EBITDA	EV/ EBIT
2000	18.75	nm	nm
2001e	3.97	nm	nm
2002e	2.90	nm	nm

Shares (000)

Daily trading volume	380.313
In issue	17,203

Potential shares (000)

Convertible bonds	none
Warrants	none



	Turnover (EURm)	EBITDA (EURm)	EBIT (EURm)	Operating margin (%)	Reported earnings (EURm)	ROE (%)	ROCE (%)
Hist peak (1999)				16.5			
1999	16	4	3	16.5	2	-13.7	27.1
2000	3	-16	-19	-652.7	-28	228.8	-158.0
2001e	16	-5	-8	-52.8	-9	174.4	-38.6
2002e	22	0	-4	-19.7	-5	nm	-10.9
2003e	32	6	2	5.0	2	nm	3.0

	Cash flow (EURm)	Capital expenditure (EURm)	WCR incr/decr (EURm)	Free cash flow (EURm)	Net debt (excl. conv.) (EURm)	Gearing (%)	Interest cover (x)
1999	3	2	10	-9	2	14.4	nm
2000	-25	3	-11	-18	19	-177.9	nm
2001e	-6	4	17	-26	28	-255.3	nm
2002e	-1	5	8	-14	29	-209.3	nm
2003e	6	6	13	-12	32	-305.8	nm

2000 sales breakdown by region

France	52.9%
Europe	9.4%
US	37.7%

Shareholders split in 2000

Go Media	23.7%
Kalisto Finance	17.5%
Kalisto Entertainment	2.2%
N. Gaume	8.4%
Other	7.7%
Free float	40.5%

Phenomenia

Europe
Germany

BUY

Video games

May 2001

Promising developer on very low valuation

Price at 23/05/01

EUR21.5

FAZ 23/05/01

1,901

Market capitalisation

EUR98m

\$83m

Value of free float

EUR28m

Reuters

PNMG.F

- **Phenomenia develops PC- and console-based games, which it then licenses to international publishers. It also develops online interactive games for marketing and advertising.** In April, Phenomenia created a subsidiary to develop games for wireless devices.
- **As a developer, Phenomenia enjoys higher profitability than the publishers it supplies,** although barriers to market entry are lower. The company has avoided the recent downturn in the market for console games, thanks to its focus on higher-margin PC games.
- **Phenomenia's strategy revolves around the core competence of content development.** Its expertise in online and interactive-TV development mean it will benefit from anticipated media convergence. The market for interactive-TV games alone could be greater than console and PC games combined.
- **Last year the company acquired a number of independent developers in Germany,** reinforcing its medium-term pipeline, which now includes several games with international potential, backed by a distribution agreement with THQ. Phenomenia's concentration on PC games development should allow it to switch easily into the development of games for the forthcoming Microsoft X-Box.
- **Phenomenia is a very profitable company, with an operating margin of nearly 40%.** As one of the few quoted domestic developers, the company, in spite of its size, is well placed for domestic and international expansion. Although the sector has fallen sharply, Phenomenia is still attractively valued on a relative basis. **We maintain our Buy recommendation** - our 12-month target price is EUR32.

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	Reported earnings (EURm)	EPS (Adj) (EUR)	P/E	P/E relative	Cash EPS (EUR)	Price/Cash EPS	Net dividend (EUR)	Gross yield (%)
1999	0	0.34	64.10	2.50	0.73	29.60		
2000	3	0.77	28.00	1.26	0.61	35.10	0.00	0.00
2001e	6	1.46 *	14.70	0.62	1.69	12.70	0.00	0.00
2002e	9	2.18 *	9.84	0.51	2.54	8.47	0.00	0.00
2003e	13	3.12 *	6.88	0.42	3.83	5.61	0.00	0.00

EPS trend 1999-2003: +74.7%

*1.22 & 1.94 & 2.88 after depreciation of goodwill

High/low 12 months (EUR)	60.0 - 11.8	Performance in %	1 mnth	3 mnth	12 mnth
Price/book value 2000	2.36	Ordinary shares	58.7	33.5	-48.8
Dividend cover 2000	nm	FAZ	3.0	-0.3	-8.4

Profile

Phenomenia develops online and offline interactive games for marketing and advertising. It also develops PC and console-based games, which are then licensed to international publishers. In April, the company announced the foundation of a wireless entertainment subsidiary, Mobile Scope, which will be run by the former head of THQ Germany.

The bias towards PC games has also helped the company avoid the slow down in console games (in anticipation of the next generation consoles) experienced by other developers and publishers. Phenomenia was listed on the Neuer Markt at EUR22.5 on 22 November 1999.

The company's domestic breakout product has been the *Moorhuhn* games, which have proved highly popular as both online download and PC CD-ROM. Phenomenia has attempted to exploit the cross media potential of the *Moorhuhn* character with some success.

Strategy

Phenomenia's strategy revolves around the core competence games and content development. Its beginnings as a producer of bespoke promotional games means that the company understands the importance and potential of content as an advertising tool.

Create content

The company will continue its traditional focus on the development of online and offline gaming content. In this way it earns licence and royalty income without carrying the substantial marketing and launch costs of the publisher/distributor. Phenomenia has retained its core team of developers by allowing them to buy into the company. Acquisitions could also bring established development teams, but Phenomenia must expand its product pipeline if it is to compete effectively in the highly competitive market for traditional games.

Create licensing potential

The broad success of Phenomenia's *Moorhuhn* game has allowed the concept to spread from a free internet game to music single (*Moorhuhn Song*) to PC game. Future games will be developed with a view to exploiting such potential. The cross-over route for content and character from computer games to other media (and vice versa) is well established (*Pokemon*). The *Gnarf* online game is already developing well to this end.

Acquisitions/alliances

In addition to organic growth, in 2000 the group made several strategic acquisitions. Phenomenia has expanded significantly in offline games development with the acquisitions of Funatics, Lunatech and Heart-line. The company has also acquired a significant presence in interactive-TV games development through Black Pencil, the Swiss market leader.

Phenomedia acquisitions and joint ventures to date

Date	Company	Activity	Stake
05/00	Black Pencil	Leading Swiss interactive TV games developer	100%
05/00	Funatics Development	Offline games developer (full price)	51%*
05/00	Heart-line	Offline football games developer	100%
04/00	Netrecord-z	Online record label	10%**
04/00	Lunatech Informatics	Software developer	100%
03/00	Daywalker Studios	Joint-venture developing cartoons for TV/internet	50%

Source: Phenomedia AG. *Voting rights: Phenomedia holds an option on the remaining 49%. **Options on further 14.9%.

In 2001, the company will continue to exploit the domestic success of the *Moorhuhn* character (e.g. with Playstation and Gameboy Colour releases), while developing other characters. The *Gnarf* online game will be relaunched later this year with an accompanying TV series. The wireless games business will be important for future growth, currently the system is in tests.

Strengths

- Strong history of games development.
- Controls content for mass-market products across different media.
- Historic focus on high-margin PC games, no dependence on consoles.
- Well positioned for X-Box game development (close to PC).
- Stable revenues from advertising games reduce overall volatility of the group.
- Historically effective development-cost control.

Weaknesses

- No direct access to the market
- Strong competition from global publishers.
- High dependence on one product, *Moorhuhn*, (FY00: 40% of sales, 60% of EBITA).

Forecasts

Phenomedia's FY 2000 results reflect the success of the *Moorhuhn* character with revenues beating our forecasts by some 10%. *Moorhuhn* games and merchandising licences accounted for more than 40% of total group revenues, and more than 60% of group operating profit before goodwill amortisation. 2000 EBIT came in below our expectations by some 20% due to the high additional costs associated with the expansion of the bespoke advertising games business. In addition, unexpectedly high goodwill amortisation charges impacted EBIT, as a result of the five acquisitions made during 2000.

In light of the 2000 results we have reduced our expectations for the current year (EPS excluding goodwill: EUR1.5 vs. EUR2.0, Sales: EUR18.7m vs. EUR20m, EBIT: EUR6.9m vs. EUR8.8m). We believe a more cautious approach towards *Moorhuhn* revenues is appropriate, particularly since the timing of the company's wireless gaming venture is uncertain. The introduction of more (international) full-price games into the product mix should help reduce the longer-term volatility of earnings. Operating margins will be kept high by continuing *Moorhuhn* income.

Valuation

Phenomenia is cheap on all valuation measures against the European games software sector. On 2002 EV/EBITDA multiples, Phenomenia is trading at an 76% discount to the peer group! If this discount were to narrow to 64%, this would imply a share price of EUR32, nearly double the current levels. Although Phenomenia is still essentially a domestic player, it is extremely profitable, and is well positioned to exploit future growth potential from avenues such as X-Box, or wireless games. The current discount to the sector is exaggerated.

Conclusion

Although the interactive gaming sector has been hit hard by the drawn-out introduction of the new generation consoles, Phenomenia has remained unaffected due to its focus on PC games. As a pure developer, Phenomenia retains control of the content it creates, thereby remaining independent of any one distribution channel (electronic or physical). Phenomenia is one of the most profitable companies on the Neuer Markt with an operating margin of close to 40%. As one of the few quoted domestic developers the company is well placed for domestic and international expansion. Although the sector has fallen sharply, Phenomenia is still attractively valued on a relative basis.

Key figures
Phenomedia
Enterprise value

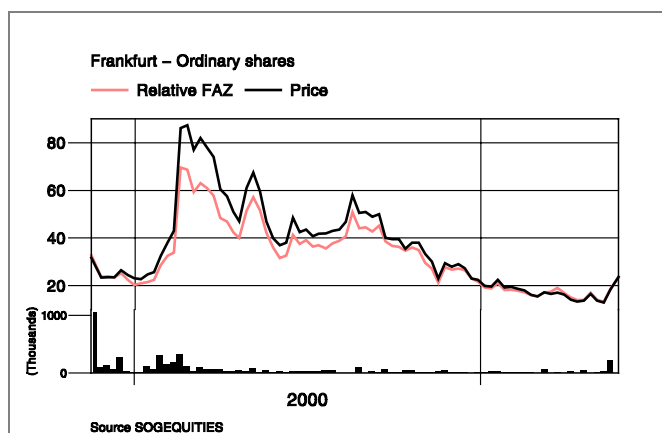
	EV/ Turnover	EV/ EBITDA	EV/ EBIT
2000	5.67	12.23	13.73
2001e	4.92	8.94	11.44
2002e	3.28	5.94	7.59

Shares (000)

Daily trading volume	39,182
In issue	4,535

Potential shares (000)

Convertible bonds	none
Warrants	none



	Turnover (EURm)	EBITDA (EURm)	EBIT (EURm)	Operating margin (%)	Reported earnings (EURm)	ROE (%)	ROCE (%)
Hist peak (2000)				41.3			
1999	5	3	2	34.9	0	9.8	33.9
2000	16	8	7	41.3	3	10.0	12.9
2001e	19	10	8	43.0	6	15.1	12.9
2002e	29	16	12	43.1	9	19.4	17.1
2003e	40	23	18	45.4	13	22.8	20.4

	Cash flow (EURm)	Capital expenditure (EURm)	WCR incr/decr (EURm)	Free cash flow (EURm)	Net debt (excl. conv.) (EURm)	Gearing (%)	Interest cover (x)
1999	3	2	4	-2	-24	-83.9	nm
2000	3	3	17	-17	-5	-11.8	nm
2001e	8	4	3	1	-5	-11.7	nm
2002e	12	5	8	-2	-4	-6.4	nm
2003e	17	7	12	-2	-2	-2.7	nm

2000 sales breakdown

Licensing	51.7%
PC games	24.1%
Advertising games	13.8%
Other	10.4%

Shareholders split in 2000

Scheer family	16.4%
Other	45.3%
Free float	38.3%

Titus Interactive

Europe
France

HOLD

Video games

May 2001

Still waiting for a recovery

Price at 23/05/01

EUR7.6

SBF 250 23/05/01

3,614

Market capitalisation

EUR55m

\$47m

Value of free float

EUR36m

Reuters

TITP.LN

Analyst

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- **Group sales over the first nine months of FY2000/01 (to end June) came out at EUR149.4m, up 46.7%** on a non-comparable basis (Virgin Interactive Entertainment and Interplay Entertainment were included from 1 October 1999 and 1 November 1999 respectively).
- **Interplay announced the success of its US\$12.7m capital increase and the opening of a US\$15m credit line for a period of three years.** These operations enabled Interplay to reduce its short-term debt from US\$24.5m to US\$5.5m and replace a credit line expiring late April 2001, on which Titus guarantees the payment for up to US\$20m.
- **We are looking for sales of EUR167.1m in 2000/01 and EUR208.9m (+25%) in 2001/02.** We estimate operating profit at EUR-9.3m in 2000/01 and EUR0.8m in 2001/02. Net profit before goodwill now comes to EUR-29.2m in 2000/01 (including EUR19.9m of exceptional losses) from EUR4.4m, and EUR-1.2m in 2001/02 from EUR2.6m.
- **With 2001 and 2002 EV/sales multiples of 1.3x and 1.0x, respectively, Titus is still trading at a discount to the sector average.** Nonetheless, the company's current operating problems and its tight financial position prompt us to maintain a **Hold rating** on the stock.

	Reported earnings (EURm)	EPS (Adj) (EUR)	P/E	P/E relative	Cash EPS (EUR)	Price/Cash EPS	Net dividend (EUR)	Gross yield (%)
1999	-28	-2.09	nm		-1.38	nm	0.00	0.00
2000e	-30	-1.99 *	nm		-2.36	nm	0.00	0.00
2001e	-7	0.10 *	71.90	3.52	0.54	13.90	0.00	0.00
2002e	6	1.31 *	5.76	0.32	3.01	2.51	0.00	0.00

EPS trend 1999-2003: NS

*-2.75 & -0.67 & 0.53 after depreciation of goodwill

	High/low 12 months (EUR)	Performance in %	1 mnth	3 mnth	12 mnth
Price/book value 2000	30.0 - 4.5	Ordinary shares	1.9	-39.0	-57.6
Dividend cover 2000	2.10	SBF 250	4.7	4.8	-6.8
	nm				

Profile

Titus develops, publishes and distributes games software. In 1999, Titus acquired two software publishers, Interplay in the US and Virgin Interactive Entertainment in the UK. The group now has 720 employees spread between the US, Europe, and Japan.

In the span of a year, Titus has transformed itself from a French software publisher to a world class player ranking among the top 10 in the industry (based on combined sales of the three companies). In 1997, it was only one of the top 20 worldwide. Titus has thus become a global player with an international distribution network and products designed for a broad public that are adapted to all game console formats as well as the PC.

The Interplay and VIE acquisitions have given the Titus group an international dimension with a global distribution network. Titus is keeping the three brands addressing different markets - Interplay for adults, VIE for teenagers and Titus for the family market.

A prudent online strategy involving a number of minority shareholdings

At the same time, Titus has made numerous investments in a range of online gaming companies, often taking minority stakes out of caution but with an option to gain control. We estimate that revenues from online activities will account for about 2% of the 2001 total and will come entirely from Interplay.

At present, Titus owns stakes in the following companies:

- **Havane Media (33%):** the company has created www.patakes.com, a portal for students, and is installing 50 internet terminals on university campuses (by the end of June).
- **PronostiX (34%):** this online gambling site had 60,000 members at the end of March 2001, up from 20,000 in November. Its main product *Matfoot* is similar in concept to *Winamax* on TF1's website.
- **Playsoft (66% of the equity and 55% of voting rights):** an innovative specialist in developing games for mobile phones, Playsoft is currently in talks with a number of operators and results are expected soon. Playsoft is also actively acquiring licences.

An offline strategy based on licences and intellectual property

Titus's strategy is based not only on products developed in-house but also on the acquisition of licences such as *Top Gun*, *Robocop*, *Baldur's Gate* and *Matrix*. Titus intends to pursue this strategy and should regularly announce major licence acquisitions. These will enhance the catalogue's value by increasing a product's sales potential and the likelihood of it becoming a hit. Titus currently owns around ten licences and a dozen intellectual property rights offering considerable sales potential. We estimate the potential associated revenues at over EUR150m, which corresponds to a virtually guaranteed level of sales. To this, we must add revenues on the games catalogue and from distribution and re-releases.

Titus currently has the capabilities required to develop products for all of the new generation of game consoles. The group expects console sales to break down as follows in mid-2003:

Targeted sales by console: mid-2003

	%
PS2	26
PC	23
X-Box	16
GameCube	10
Gameboy Advance	10
Previous generation game consoles	15

Source: Company data

Titus aims to pursue its acquisition growth policy by acquiring small studios that will enhance its development potential and enrich its catalogue. It is also keeping a close eye on bigger projects, but following the sharp drop in its share price, it would be difficult for Titus to carry out share-swap deals, and its current financial position would not allow it to finance a major deal through cash flow.

The commercial agreement signed with TF1 in November 2000 offers Titus a number of new development opportunities:

- Older products (already depreciated) can be relaunched via TF1's distribution network in France at unit prices of between EUR7.6 and EUR15.2. This will affect 7 or 8 products in 2000/01.
- TF1 plans to develop a merchandising activity in conjunction with Titus, with a sales team to market Titus merchandise such as toys. This is a relatively underdeveloped area for video game companies (with the exception of *Pokemon* and *Lara Croft* products), while it is a very high-margin activity (gross margin of over 95% excluding royalties). The German company Phenomedia, for example, signed an agreement with Ravensburger in this area. We expect this line of business to start up with two products in 2001 and at least four in 2002.
- The agreement will generate advertising revenues through media sales in offline games. This model, which applies primarily to sports games, will be handled by TF1's media sales agency.
- In the online segment, small web games are due to be provided on the TF1 portal. Going forward, however, the real area of interest for TF1 will be games for interactive television.

Outlook

Group sales over the first nine months of FY2000/01 (to end June) came out at EUR149.4m, up 46.7% on a non-comparable basis (Virgin Interactive Entertainment and Interplay Entertainment were included from 1 October 1999 and 1 November 1999 respectively).

Over just the third quarter, unaffected by consolidation changes, organic growth came to 18.7%, a satisfactory level, with the group benefiting from a firm pace of new releases for existing platforms and the integration of the Virgin and Interplay distribution networks which has added impetus to sales in both Europe (49% of sales) and the US (51% of sales).

Around 30 products are planned for the second half (versus 41 in H1) in a still sluggish market. Our forecast for FY2000/01 sales is EUR167.1m and EUR208.9 (+25%) for 2001/01. We are looking for operating profit of EUR-9.3m in 2000/01 and EUR0.8m in 2001/02 and net profit before goodwill of EUR-29.2m in 2000/01 (including EUR-19.9m in exceptional losses) versus EUR-4.4m and EUR-1.2m in 2001/02 versus EUR2.6m.

The gross margin rose sharply to 52.5% from 37.2%, thanks to a well-balanced product mix between console and PC-based games. Yet control over operating charges was not as tight as expected, especially concerning marketing expenses. These expenses were relatively high compared to the sales potential of the products, since only one managed to sell over 1 million copies (*Baldur's Gate 2*) and 6 sold between 200,000 and 400,000 copies. Despite a catalogue of quality PC-based products, which tend to have a longer shelf life, the back catalogue accounted for only 16% of sales. After an unexpected exceptional loss of EUR18.9m relating to the halting and/or depreciation of N64, PC and PS1 products and a net financial charge, the group reported a net loss of EUR22.6m.

Following the purchase of 50,000 convertible bonds (2% 2005) by the founders during the first half, we think the founders and the group will continue this strategy and thus potentially pay down the group's debt, since the founders are more likely to convert. This would generate an interest saving and allow holders of these instruments to withdraw from a bond whose probability of conversion is now virtually zero.

The US game publisher Interplay, in which Titus Interactive holds a 34% stake, reported sales of US\$104.6m, up 2.6%, for the year ended 31 December 2000. It reported an operating loss of US\$8.4m, down from US\$32.8m in 1999, and a net loss of US\$12.1m, down from US\$41.7m in 1999. Even though the company has not reached breakeven yet, it has turned around significantly, with a gross margin of 48% in 2000, from 40% in 1999, and a 70% cutback in its net loss.

Interplay announced the success of its US\$12.7m new share issue and the opening of a US\$15m credit line for the next three years. Thanks to these moves, the group reduced its short term debt to US\$5.5m from US\$24.5m, and replaced a credit line expiring late April 2001, on which Titus guarantees the payment for up to US\$20m.

The capital increase diluted Titus' stake in Interplay to 34% of equity and 42% of voting rights, from 42% and 54%, respectively, previously. Yet by retaining over 40% of voting rights, Titus fully consolidates Interplay while limiting its cash spent in Interplay. Titus also holds US\$20m in Interplay convertible bonds, which it can convert as of 31 May 2001. Conversion would raise Titus's stake to 44% of equity and to hold 50% of voting rights.

Strengths

- A catalogue that is diversified by product type and platform.
- An international distribution network.
- A prudent investment policy in the online segment.

Weaknesses

- A lack of visibility in a market that is still in transition.
- Following a series of profit warnings, Titus convertibles were hit by very sharp declines, the result not simply of the drop in the underlying share price, but also the deterioration of credit quality. They are now trading with yields to maturity above 30% and the market rates credit quality at 5,000bp above Euribor, close to a default risk level. The probability of conversion at maturity is therefore close to zero even though the convertibles could potentially benefit from a double leverage effect: the rise in the share price and a related sharp reduction in the implied issuer risk.

- A stretched financial position - of the EUR230m in total debt at 30 June 2000, EUR151.5m corresponds to the two OCEANEs (bonds convertible in new or existing shares) issued in 1998 (67% of which have been converted) and in 2000 (not yet converted, maturing in 2005). With a conversion price of EUR84 for the convertibles issued in 2000, we consider them equivalent to conventional debt.
- Note Titus's free float of 65% (corresponding to 54% of the voting rights). We think that Titus's low multiples make it a potential target for a sector player looking to strengthen its catalogue and distribution network, or for the owner of a broadcasting channel seeking to round out its business with content.

Valuation

Titus's EV/sales for 2002 and 2003 (adjusted for minority interests) are 1.2x and 0.9x respectively. The medians for European games software publishers are 1.9x for 2002 and 1.5x for 2003. Titus is thus at a discount.

Conclusion

Fiscal 2000/01 will remain a transition year for Titus. Yet with 40 products for new game consoles scheduled for release in 2001/02, the company seems to have the production force necessary to approach this turning point with conviction.

With 2001 and 2002 EV/sales multiples of 1.2x and 0.9x, respectively, Titus is at a discount to the sector average. Nonetheless, the company's current operating problems and its tight financial position prompt us to maintain a **Hold** recommendation on the stock.

Key figures
Titus Interactive
Enterprise value

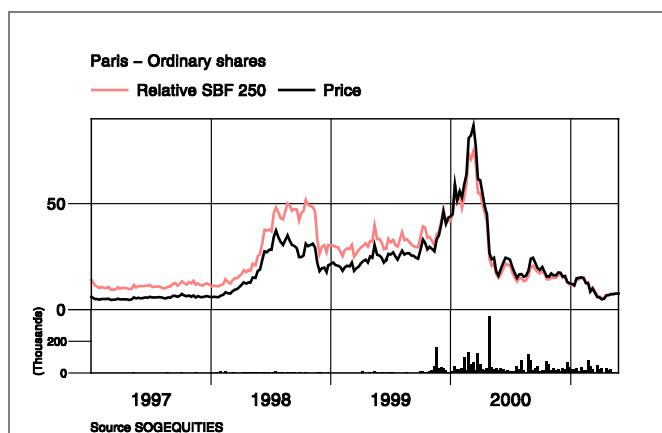
	EV/ Turnover	EV/ EBITDA	EV/ EBIT
2000e	1.92	nm	nm
2001e	1.83	25.70	nm
2002e	1.35	11.01	28.92

Shares (000)

Daily trading volume	30,857
In issue	7,308

Potential shares (000)

Convertible bonds	2,074
Warrants	670



	Turnover (EURm)	EBITDA (EURm)	EBIT (EURm)	Operating margin (%)	Reported earnings (EURm)	ROE (%)	ROCE (%)
Hist peak (1999)				-10.2			
1999	143	-5	-15	-10.2	-28	-63.7	-7.4
2000e	167	2	-9	-5.6	-30	-52.3	-2.7
2001e	209	15	1	0.4	-7	-3.6	0.2
2002e	265	33	12	4.7	6	33.4	3.1

	Cash flow (EURm)	Capital expenditure (EURm)	WCR incr/decr (EURm)	Free cash flow (EURm)	Net debt (excl. conv.) (EURm)	Gearing (%)	Interest cover (x)
1999	-14	41	11	-66	119	175.4	nm
2000e	-25	48	3	-77	196	509.1	93.4
2001e	6	61	5	-60	256	814.2	0.4
2002e	32	77	7	-52	309	832.6	12.4

Geographic breakdown of 2000 sales	%
US	43.0
Europe	44.2
France	8.8
Australia and Asia	4.0

Shareholders at 30 Jun 2000	% shares	% voting
Mr Hervé Caen	13.92	21.57
Mr Eric Caen	13.65	18.65
AMVESCAP plc	7.29	5.97
Free float	65.14	51.81

Ubi Soft Entertainment

Europe
France

HOLD

Video games

May 2001

Potential fairly valued

Price at 23/05/01

EUR46.9

SBF 250 23/05/01

3,614

Market capitalisation

EUR781m

\$667m

Value of free float

EUR542m

Reuters

UBIP.PA

Analyst

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- **The company's current strategy is to expand by medium-sized acquisitions.** At the beginning of the year, Ubi Soft bought one of Germany's main development studios, Blue Byte, thus reinforcing its in-house R&D department. The acquisition of The Learning Company's (TLC) game division will produce a positive impact on the group, notably by bringing a catalogue of PC products and licences.
- **Ubi Soft reported sales of EUR259.8m (up 39%) for the year ended 31 March 2001** (like-for-like sales were EUR211.8m, up 13.5%), or more than our EUR242.5m estimate. This good performance is attributable to a robust 52% increase in the fourth quarter on a reported basis, although sales declined 8% like-for-like because of the small number of launches.
- **We are looking for sales growth of 40% in 2001/02** to EUR364.1m.
- **Uncertainties persist over the first half of 2001/02, notably regarding margins.** We maintain our 2001/02 operating profit estimate at EUR27.2m, or a 532% increase and net profit at EUR13.8m, up 126%. For 2002/03, we are projecting net profit of EUR28.9m.
- **In the near term, the company offers clearer visibility than its French peers,** but we think a valuation on an EV/sales close to that of the majors in the sector is not justified.
- **We maintain our Hold recommendation.**

	Reported earnings (EURm)	EPS (Adj) (EUR)	P/E	P/E relative	Cash EPS (EUR)	Price/Cash EPS	Net dividend (EUR)	Gross yield (%)
1999	11	0.59	79.8	2.84	2.53	18.50	0.00	0.00
2000e	6	0.38 *	nm		2.60	18.00	0.00	0.00
2001e	14	0.93 *	50.4	2.47	4.42	10.60	0.00	0.00
2002e	25	1.50 *	31.3	1.75	5.40	8.68	0.00	0.00
2003e	27	1.72	27.3		6.79	6.91	0.00	0.00

EPS trend 1999-2003: +30.8%

*0.31 & 0.72 & 1.29 after depreciation of goodwill

High/low 12 months (EUR)	64.4 - 28.7	Performance in %	1 mnth	3 mnth	12 mnth
Price/book value 2000	3.13	Ordinary shares	18.9	28.5	8.2
Dividend cover 2000	nm	SBF 250	4.7	4.8	-6.8

Profile

Ubi Soft develops, publishes and distributes game software for PCs and for new- and older-generation consoles. Ubi Soft ranks no. 2 among European video game publishers. The company's catalogue is diversified by platform and by genre. With its *Rayman* licence, Ubi Soft is active in educational products for children as well as in games for teenagers and adults. The company has 1,700 employees, including 1,300 in production.

Strategy: small, highly selective acquisitions

At the moment, Ubi Soft's strategy is to make medium-sized acquisitions. Unlike Infogrames, Ubi Soft is seeking to round out its development and distribution forces with specialised companies that complement its existing organisation. After making several acquisitions to reinforce its distribution network in Europe in 1999 and 2000, at the beginning of 2001, Ubi Soft began to focus on strengthening its production force.

At the beginning of the year, Ubi Soft reinforced its in-house R&D department by acquiring one of Germany's largest development studios, Blue Byte. The studio has 64 employees and operates in Germany, the US and the UK. It currently specialises in PC products but plans to move into games for the new-generation consoles. Ubi Soft previously had only a sales and distribution force in Germany.

The acquisition thus strengthens Ubi Soft's position in Germany. This is Europe's second largest market. One of its special attributes is its strong orientation towards strategy games.

Blue Byte was consolidated as from 6 February 2001. Ubi Soft forecasts annual sales of EUR20m for Blue Byte, with a positive contribution as from this year. We think this is entirely feasible insofar as the studio has reached significant sales volumes.

The acquisition of The Learning Company's (TLC) game division will have a positive impact for Ubi Soft, as it brings in:

- A development team with 50 employees, including 40 in R&D;
- A large catalogue with 67 PC games. However, we think that only about 30 of these products have real potential. The company is scheduled to release 10 new PC games for adults in FY2001/02, including *Myst III: Exile*, one of the biggest hits in the adventure game category, with sales potential of over 1 million units (10 million copies have been sold of the first three *Myst* games combined). The game is to be released in May. We estimate the turnover contribution at EUR43m in FY2001/02, with EUR20m assured by the release of *Myst III: Exile*.
- A better balance between PC and console games: PC products generated around 25% of turnover for the year ended 31 March 2001 and should account for 30% to 35% of total sales in FY2001/02. This change will improve the company's gross margin, as the margin on PC games is higher than on console games.
- 80 brands and licences, with 70 owned outright, including *Prince of Persia*, *Chessmaster* and *Harpoon*. The company has secured the *Myst* licence for five years.
- Previously, 80% of games were developed by external studios. In the future, Ubi Soft plans to develop most of its products in-house and to shift their focus to the new-generation consoles.

The entity has been consolidated since last February and will therefore make a contribution to turnover in the first half of FY2001/02. The release of *Myst III: Exile* in May will affect the seasonal bias. Hence, we expect first-half turnover to account for 35% to 40% of total sales for the year. In addition, the increase in the number of PC products in the catalogue will provide more regular growth, with sales of PC products expected to expand by 7% to 10% in 2001, at a time when the console market will still be in transition.

Strengths

- A worldwide distribution network.
- A catalogue that is highly diversified by genre and platform.
- R&D is almost entirely in-house, giving the company control over its products throughout the production cycle.
- With its solid experience in growth by acquisition, the company will be able to assimilate the acquired companies smoothly.

Weaknesses

Uncertainties over the first half of 2001/02 persist, mainly over margins.

- There is a lack of communication over organic growth.
- Central point of the 'Guillemot galaxy'.
- Importance of in-house R&D implies optimising its management. Ubi Soft can recognise a profit because it amortises its R&D expenditure over three years. If we adjust earnings for this accounting practice, the company has not yet reached break-even.
- Thus far, the company's strategy has not enabled it to assert itself as a major world operator in the sector, on a market that is undergoing consolidation.

Outlook

Ubi Soft reported sales of EUR259.8m (up 39%) for the financial year ended 31 March 2001. Like-for-like sales were EUR211.8m, up 13.5%. Reported sales were higher than our EUR242.5m estimate. This good performance was due to a robust 52% increase in reported sales during the fourth quarter. But on a like-for-like basis, sales were down 8% because of the small number of launches.

Fourth-quarter sales were strong owing to the success of:

- *Rogue Spear* PSX, a title obtained through the Red Storm acquisition;
- *Settlers IV* PC, obtained through the Blue Byte acquisition;
- and to a solid performance by several other titles such as *Rayman2* PS2, *F1 Racing Championship*, *Dinosaur* (1 million copies sold) and *Jungle Book* (1 million copies sold).

Red Storm contributed EUR31m to turnover for the year, instead of the EUR20m we expected. The German developer Blue Byte contributed EUR7m.

Ubi Soft is becoming even more international. It now generates 76% of its turnover outside France compared with 69% a year ago. Europe accounted for 44% of turnover, with strong sales in Germany and the UK. On the other hand, the percentage of sales generated in the US receded to 27.5% of the total.

Management remains cautious on its turnover estimate for 2001/02 and plans to release information on the company's prospects in June.

We are looking for turnover to expand 40% to EUR364.1m in FY2001/02. Our estimate factors in:

- The development potential of TLC's game division.
- The build-up of the acquisitions made in 2000/01 and of the recently acquired distributors in Poland, Belgium and Canada, which will be consolidated as from 1 April 2001.
- A stronger-than-expected impact on sales volume from extension of the distribution network.
- The projected launch of 160 new products, compared with 110 in 2000/01, broken down as follows:

Breakdown of new products to be released in 2001/02

	Number of titles
PS2	34
PC	60
X-Box	5
GameCube	19
Gameboy Advance	11
Gameboy Colour	15
Dreamcast	3
PSOne	13

Source: Company data

We maintain our 2001/02 operating profit estimate at EUR27.2m, or a 532% increase and net profit at EUR13.8m, up 126%. For 2002/03, we are projecting net profit of EUR28.9m.

At the end of April, Ubi Soft called in its 2% convertible bond maturing in 2003. Investors have the choice of their bonds being either converted or redeemed between 21 May and 20 August 2001 inclusive. The redemption value is EUR99.35 per bond. The conversion ratio is five shares per bond, or EUR220 based on the closing price of EUR44 on 27 April 2001. The company is keeping its second convertible, a 3.8% bond maturing in 2005. With a delta of over 0.96, there is a very high probability that this bond will attain its conversion price by 31 December 2003. We note that over 50% of the bonds have already been converted since they were issued. We have treated them as quasi-equity.

Valuation

Ubi Soft's 2001 and 2002 EV/Sales multiples are above the medians for the European companies in the sector. They are close to the multiples of the European leader, Infogrames. EV/EBITDA calculated on US GAAP standards are higher than those of Infogrames and Electronic Arts.

Our discounted free cash flow model produces a valuation of EUR50.0 per share.

DCF model

EURm	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Cash flow from operations	46	71	103	123	163	183	206	226	258	284
Capital expenditure	56.4	76.8	85	90	117	125	131	138	142	147
Change in WCR	39.2	55.5	48.5	40.0	35.0	31.0	30.0	28.0	18.0	15.0
Free cash flow from operations	-50	-62	-30	-7	11	27	45	60	98	122
Discount rate	9.9%									
Sum of DCF 98-07	39									
Perpetual growth rate	4.0%									
Discounted terminal value	834									
Enterprise value	874									
(-) debt	1									
(+) long-term investments	140.0									
(-) minorities	0.0									
Equity value	964									
Number of shares (m)	19.298									
Value per share	50.0									

Source: SG Securities

WACC calculation

EURm	
Shareholders' equity 01	288.8
Net debt 01	49.5
SE + ND	338.3
ND/(SE + ND)	15%
SE/(SE + ND)	85%
10-year OAT yield	5.20%
Market risk premium	4.10%
Beta	1.4
Cost of equity	10.9%
Interest rate on debt	6.0%
Tax rate	35%
Net cost of debt	3.90%
Weighted average cost of capital	9.91%

Source: SG Securities

Conclusion

In the near term, Ubi Soft offers clearer visibility than its French peers. But projected margins for 2001/02 still look uncertain and we expect the company to be profitable (based on US GAAP) in 2002/03, mainly as a result of successful international expansion. In our opinion, a valuation on EV/Sales similar to that of the major operators in the sector is not justified for the moment.

We maintain our **Hold** recommendation.

Key figures
Ubi Soft Entertainment
Enterprise value

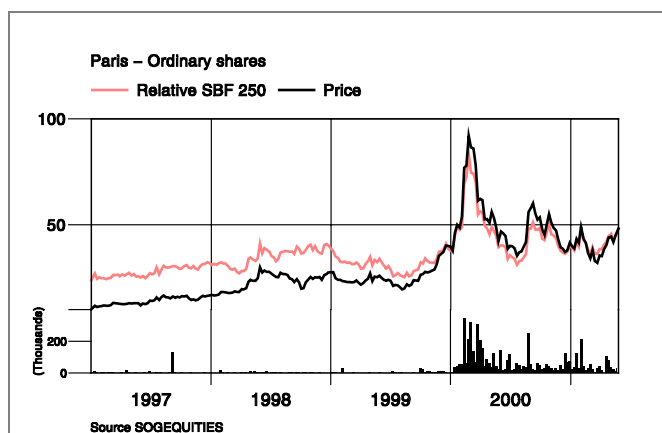
	EV/ Turnover	EV/ EBITDA	EV/ EBIT
2000e	2.65	14.55	nm
2001e	2.03	7.77	27.13
2002e	1.68	6.44	17.74

Shares (000)

Daily trading volume	30,263
In issue	16,654

Potential shares (000)

Convertible bonds	1,170
Warrants	851



	Turnover (EURm)	EBITDA (EURm)	EBIT (EURm)	Operating margin (%)	Reported earnings (EURm)	ROE (%)	ROCE (%)
1999	187	51	14	7.3	11	7.1	6.7
2000e	260	47	4	1.7	6	2.4	1.1
2001e	364	95	27	7.5	14	5.6	5.0
2002e	455	119	43	9.5	25	8.6	6.6
2003e	546	141	50	9.2	27	8.7	6.8

	Cash flow (EURm)	Capital expenditure (EURm)	WCR incr/decr (EURm)	Free cash flow (EURm)	Net debt (excl. conv.) (EURm)	Gearing (%)	Interest cover (x)
1999	47	65	68	-85	-94	-33.4	nm
2000e	50	56	39	-45	49	15.5	nm
2001e	85	77	55	-47	106	33.0	9.1
2002e	104	85	49	-29	141	40.5	14.4
2003e	121	102	49	-30	166	46.8	16.7

2000/01 sales breakdown

Development	66%
Publishing	27%
Distribution	7%

Shareholders at 31 Mar 2000

Guillemot family	30.2%
Free float and employees	69.8%

US companies

Electronic Arts

Profile

Electronic Arts is a US games company founded in 1982 and listed on Nasdaq since 29 September 1989. The company designs, publishes and distributes online and offline games for PCs and consoles. Electronic Arts offers a broad range of games including action, adventure, role-playing, simulation and, especially, sports games under the EA Sports brand name.

Breakdown of sales and product releases by platform

	Number of products			Total revenue US\$m			% of sales		
	1999	2000	2001*	1999	2000	2001*	1999	2000	2001*
PC	29	31	13	270.8	397.8	305.4	22%	28%	30%
32-bit	21	30	16	519.8	586.8	277.9	43%	41%	27%
64-bit	9	8	3	152.3	120.4	60.0	12%	8%	6%
128-bit	0	0	10	0	0.0	157.6	0%	0%	16%
Total	59	69	42	942.9	1,105.0	800.9	100%	100%	100%

*9 months 2001

Source: Company data

Results

Promising figures

Electronic Arts has tackled the transition period well. It is gradually moving out of the 32/64-bit market and into the 128-bit segment, while pushing sales of PC games to make up for the loss of revenues resulting from the decline in 32/64-bit sales. Electronic Arts's product catalogue is well-balanced, with flagship products for all platforms.

Although sales over the first nine months were lower, results for US operations in fiscal Q3 2001 (Oct-Dec 2000) are encouraging. Sales rose 13.8% thanks to the Sony 128-bit machine, the release of strong PC titles such as *Red Alert 2* and continuing strong sales of *The Sims* games. This figure is particularly noteworthy since US sales accounted for 63% of EA's consolidated 2000 sales.

Breakdown of sales by region

US\$m	1999		2000		9 mths 2001*	
	Sales	% of total	Sales	% of total	Sales	% of total
US	705.0	42.0	846.6	59.6	641.5	63.2
Europe	444.0	36.3	492.4	34.7	291.7	28.7
Japan	33.4	2.7	33.4	2.4	40.2	4.0
Asia-Pacific	39.6	3.2	47.6	3.4	41.5	4.1
Total	1,222.0	100.0	1,420.0	100.0	1,014.9	100.0

Source: Company data

R&D expenses increased owing to the higher costs generated by the transition to new-generation consoles (PS2, Dolphin and X-Box) but they are expected to remain stable after the transition. These costs are expected to flatten out. All R&D costs are expensed.

R&D expenses as a percentage of sales

	1999	2000	9 months 2001
R&D/sales	16.5%	18.4%	27.7%

Source: Company data

Strategy focused on both offline and online games**Recent acquisitions**

Company	Date	Sector	Country	Purchase price
Pogo.com	28 Feb 2001	Online games developer	US	na
Dreamworks Interactive	24 Feb 2000	Developer	US	na
Kesmai Corporation	7 Feb 2000	Online games developer	US	31.1
Playnation	28 Sep 1999	Online games developer	US	na
Westwood Studios	Sep 1998	Developer	US	122.7
ABC Software	July 1998	Distributor	Austria & Switz.	10

Source: SG Cowen

In 1996, Electronic Arts created *Ultima Online*, the first massively multiplayer online game. This was the first step into a new era for EA and the beginning of its investment in an online strategy. In 2000, EA created EA.com to serve as the umbrella for all the company's online business. Between 1999 and 2000, Electronic Arts also acquired three online game publishers, Pogo.com, Kesmai and Playstation. In November 1999, the company signed a contract with AOL to serve as the exclusive supplier of online games for all AOL online services. In two years, EA will have invested over US\$150m, including US\$81m in the partnership with AOL, under the terms of which EA will receive 95% of the revenues generated by online subscriptions and 70% of the proceeds from games sales on AOL. EA's future therefore partly depends on online games.

Management is looking for online revenues to double by 2002 and for its online business to start generating profits in 2003. Within five years, EA expects to have sales of US\$1.2m and 10 million users. To achieve this, it will have to win over new target audiences, women and internet users aged over 35, and it has made this a priority. It was with this in mind that EA took over Pogo.com which addresses these audiences.

In the offline business, EA hopes eventually to gain 50% of world PS2 game sales during the Christmas period. In August 2000, EA paid an estimated US\$27m to acquire the exclusive rights to develop games based on the highly popular *Harry Potter* books for the PS2 and online. The books have been published in 28 languages in 115 countries. The release of the film version from Warner Bros in November 2001 will surely serve to boost sales of the game in December 2001.

Strengths and weaknesses

Strength	Weakness
World no. 1: strong name recognition and worldwide market	Large investment in online games (US\$150m in two years)
Game quality recognised by all players	High exposure to PS2 (delivery delay)
Very high recall licences exploited	High exposure to sports games, a volatile segment but profitable for the leader
Flexibility in response to evolving market	
Strong online partnerships (AOL, NFL.com...)	

Source: SG Cowen

Acclaim

Profile

Acclaim listed on Nasdaq on 3 April 1989. The company develops, publishes and distributes video games for PCs and consoles. Acclaim has four development studios in the US and UK and has built up a direct distribution network in North America, the UK, Germany, France, Spain and Australia. In addition to its core business, the company publishes derivative products, such as strategy guides and the comic strips, *Turok* and *Shadowman*, which also promote its games.

2000 results

Breakdown of sales by platform

	Revenue (US\$m)			% of total sales		
	1998	1999	2000	1998	1999	2000
PC	32.7	34.5	11.3	10%	8%	6%
Portable	6.5	21.5	17.0	2%	5%	9%
32-bit	98.0	116.4	60.4	30%	27%	32%
64-bit	186.1	254.3	58.5	57%	59%	31%
128-bit	0.0	0.0	39.6	0%	0%	21%
Other	3.3	4.3	1.9	1%	1%	1%
Total	327.3	431.0	188.7	100%	100%	100%

Source: Company data

In the year to 31 August 2000, Acclaim posted a net loss of US\$131.7m on sales 56% lower at US\$188.6m. This poor performance was worse than other companies in the sector and underlines the difficulty management has had in weathering the transition period in the consoles market that began in 2000. The move from 32-bit to 64-bit had already generated substantial losses in 1995 and 1996.

This transition phase, marked by a scarcity of hits and even more by intense price competition for the less prominent titles, affected the company particularly badly since it is short of flagship products (*South Park*, *WWF*, ...).

The games catalogue is overexposed to the N64 (59% of 1999 sales). Sales of games for this console slowed appreciably in 1999 and virtually dried up in 2000. This cut into the company's sales and gross margin, as game cartridges are significantly more expensive than CD-ROMs.

For FY2001, the company has initiated a restructuring programme to trim marketing expenses and the cost of the sales force by 30%, and to reduce certain other operating costs.

A lacklustre first quarter 2001 (31 Aug-2 Dec 2000)

Acclaim's financial year ends on 31 August. In theory, its first quarter 2001 should have ended on 30 November 2000. For some unspecified reason, management has decided to close its quarters on the Saturday nearest the end of the theoretical quarter. This decision has a negligible impact on the company's accounts.

First fiscal quarter results

	30 Nov 99	2 Dec 00
Sales (US\$m)	101.2	72
Gross margin	60.4%	66.6%
Operating margin	4%	19%

Source: Company data

Breakdown of sales by region

US\$m	1999		2000		2001	
	Sales	% of total	Sales	% of total	Sales	% of total
US	73.70	70.3	64.13	63.4	56.97	77.7
Other	31.13	29.7	37.02	36.6	16.06	22.3

Source: Company data

The continuing decline in sales for the N64 (2.3% of turnover compared with 28% in Q1 2000) was not offset by sales for the Dreamcast (14% of turnover), which were disappointing unlike in FY2000. As Sega has announced plans to discontinue production of the machine, Acclaim's position was in any event not clear in the medium term. It has therefore decided to stop publishing titles for the N64 and to reduce the number of games for the Dreamcast.

Acclaim also encountered delays in the development of certain games. This led to a significant loss of income, since video game sales are highly concentrated during the Christmas period.

Lastly, the company was unable to renew its *WWF* and *South Park* licences. These titles had accounted for 25% and 13% of gross sales respectively in Q1 2000.

However, the drastic reduction in the percentage of sales from the N64 improved margins significantly while operating costs have fallen 40% following the restructuring plan announced during the previous year.

Strategy

R&D spending on the rise

Acclaim is investing massively in its R&D department in order to secure a presence on new consoles and thus make up its lag.

R&D spending (US\$m)

Year ending 31 August	1998	1998	2000
R&D	37.367	50.452	57.41
R&D/sales	11.4%	11.7%	30.4%

Source: Company data

A catalogue with no real flagship products

Despite losing the *South Park* and *WWF* licences, Acclaim has a few productive franchises such as *Dave Mirra Freestyle BMX* and *Mary Kate & Ashley*. These have allowed it to maintain its 4% market share in the US, ranking it eighth among game publishers in the fourth calendar quarter of 2000.

Outlook

Management's difficulties, particularly during transition periods, have caused the share price to collapse. The markets are counting on a possible takeover by a competitor, which could thus acquire a development platform at low cost.

Strengths and weaknesses

Strengths	Weaknesses
Some attractive licences (<i>Dave Mirra BMX</i> , <i>Mary Kate & Ashley</i>)	Poor management of transition periods towards new generation consoles
Success of restructuring plan over last quarter (40% cut in operating costs)	Loss of <i>South Park</i> and <i>WWF</i> licences

Source: SG Cowen

THQ

Profile

THQ was founded in 1989 and listed on 1 August 1991. The company develops, publishes and distributes video games for the PC, PSX, Dreamcast, N64, GBC and the new PS2. With 7% market share in the fourth quarter of 2000, THQ is the fourth largest console game publisher in the US, behind Activision. The company has products in most game categories (combat, role-playing, sports and strategy) and places the priority on licences such as *WWF*, *Scooby Doo* and *Power Rangers*, which are highly popular with children. THQ has a strong international orientation, with a distribution network covering over 60 countries. It also plans to expand into e-commerce and online games, as evidenced by its acquisition of Genetic Anomalies, a studio specialising in internet entertainment.

Results

Figures for 1999 and 2000 (year to 31 December)

US\$m	1999	2000
Sales	303.5	347.0
Gross margin	55.6%	59.4%
Operating margin	16.0%	8.6%

Source: Company data

The 14.4% rise in 2000 turnover was due to a solid sales performance on the domestic market, an increase in the number of titles released (46 against 42 in 1999) and the success of a few key licences such as *WWF* (52.8% of turnover), *Power Rangers* (5.4%) and *Rugrats* (13.5%). International sales were boosted by newly created subsidiaries in France and Australia which offset the impact of the decline in sales in Germany and of the euro's depreciation.

Gross margins improved slightly owing to the shift in product mix away from N64 games, which require high-priced cartridges.

Operating costs increased 84% to 91.4% of sales due to the build-up of PSX games, which are more costly in terms of royalties, to the larger number of titles released, to the development studios' expansion, and particularly to an exceptional charge of US\$9.8m. This charge was for the amortisation of certain products that generated below-average royalties than average and whose development was interrupted.

The company's business is still highly concentrated in the US.

Breakdown of sales by region

Year to 31 Dec US\$m	1998		1999		2000	
	Sales	% of total	Sales	% of total	Sales	% of total
US	187.1	86.6%	228.8	75.4%	270.1	77.8%
Other	28.96	13.4%	74.7	24.6%	76.9	22.2%

Source: Company data

Strategy

R&D spending on the increase

The increase in R&D expenditure is due to the larger number of titles in the pipeline and to continuing expansion of the companies' studios.

R&D expenses (US\$m)

Year to 31 Dec	1998	1999	2000
R&D	8.861	15.420	19.085
R&D/sales	4.1%	5.1%	5.5%

Source: Company data

Prudent growth by acquisition aimed at acquiring licences and development capabilities

Recent acquisitions

Date	Company	Business
Aug 2000	Volition Inc.	Game developer
Mar 2000	Yuke's Company Ltd	Japanese combat game developer
Dec 1999	Genetic Anomalies Inc.	Internet entertainment studio
May 1999	Pacific Coast Power & Light	Game developer
Dec 1998	Rushware GmbH	German publisher and distributor

Source: Company data

Of the two companies acquired in 2000, Yuke's Company is the creator of *WWF Smackdown 1* and *2* while Volition is the creator of *Summoner* and *Red Faction* which are to be launched soon.

THQ is a leader in children's games, with a string of prominent licences.

These licences include *Power Rangers*, *Scooby Doo*, *Rugrats* and especially *WWF*. The loss in early 1998 of the *WCW* licence to Electronic Arts was offset by the June 1998 agreement with the World Wrestling Foundation (WWF) in June 1998. This led to the creation of a joint venture with JAKK Pacific for the development, production and distribution of *WWF* games. The deal has been highly rewarding. *WWF No Mercy* and *WWF Smackdown 2* have reached second and first place respectively for the N64 and Playstation since their launch in November 2000. The licence accounted for about 50% of sales in Q4 2000.

Breakdown of sales by platform

	Number of products			Sales (US\$m)			% of total sales		
	1998	1999	2000	1998	1999	2000	1998	1999	2000
PC	5	11	6	10.8	24.2	10.4	5%	8%	3%
Nintendo	3	10	4	118.9	105.8	100.6	55%	35%	30%
Gameboy	5	12	19	17.3	51.4	69.4	8%	17%	21%
Sony	8	9	13	67.0	111.9	142.3	31%	37%	42%
Sega	0	0	4	0.0	6.0	6.9	1%	2%	2%
Other	0	0	0	0.0	3.0	6.9	0%	1%	2%
Total	21	42	46	214.0	302.3	336.5			

Source: Company data

Outlook

THQ is seeking to expand internationally. It has undertaken:

- To internationalise its distribution network. This is illustrated by the acquisition of Rushware in Germany in 1998 and by the opening of offices in France in May 1999 and Australia in March 2000. The company's oldest presence is in the UK. THQ can now sell directly to distributors in 70% of the world market. This enables it to avoid paying fees to intermediaries and gives it better control over logistics. THQ expects to generate 30% of its turnover abroad in 2001.
- To launch titles that are more European, because the company is aware of the very American nature of its licences (*WWF*, *Rugrats*). To achieve this, THQ wishes to launch more neutral brands such as *Summoner* or *Red Faction*, or more European titles such as *Cultures* or *Mercedes*.
- To prepare for the anticipated takeoff in online games as broadband internet access spreads. The company has opted for a cautious strategy, creating content for which standard connections are sufficient. Following the acquisition of Genetic Anomalies in 1999, THQ expects to launch its first online product, which will be based on *WWF* game cards, during the first half of 2001.
- To create titles based on popular licences such as *Scooby Doo* (exclusive rights until 2003), *Sponge Bob Square Pants* and *Power Rangers* (licensed until 2004) in order to reduce *WWF*'s predominant share in sales (51% in 2000 and an estimated 25% in 2001).

Strengths and weaknesses

Strengths	Weaknesses
Leader in children's games (40% market share)	Turnover concentrated on a few titles. <i>WWF</i> is predominant (50% of sales in Q4 2000)
Lucrative licences (<i>WWF</i> , <i>Rugrats</i> , <i>Scooby Doo</i> , <i>Power Rangers</i>)	Few international titles
Strategy of international expansion	Only 25% of sales generated abroad

Source: SG Cowen

3DO

Profile

3DO is a US company that was founded in 1990 and listed on Nasdaq in May 1993. The company develops, publishes and distributes video games for PCs and for Sony and Nintendo consoles. In 1990, Electronic Arts decided to sell Medio, a company developing a new game platform, the 3DO Multiplayer. The company was renamed 3DO in 1993 when it floated on the Nasdaq. The platform, sold under the Matsushita Panasonic name, soon proved to be a commercial failure. This induced management to sell the operating licence for 64-bit M2 graphics technology to Matsushita for US\$100m.

It was in 1995 that 3DO's business as a video games developer started. In 1996 the company acquired several development studios including Cyclone Studios and New World Computing. It shed the remainder of its hardware division in 1997, selling the business to Samsung for US\$20m. The company now employs 495 people and generates turnover of US\$122m from sales on its catalogue of games for the Playstation and PS2, and for the Nintendo 64 and Gameboy Colour.

Breakdown of sales by platform

Platform	FY98	FY99	% of catalogue	FY00	% of catalogue	9 months FY01	% of catalogue
PC	3	10	71%	16	52%	17	33%
PSX		3	21%	10	32%	14	27%
N64		1	7%	2	6%	4	8%
GBC		0	0%	3	10%	8	15%
PS2		0	0%	0	0%	9	17%
Total	3	14	100%	31	100%	52	100%

Source: Company data

The company has several strong licences – *Army Men*, *Might and Magic*, *High Heat Baseball* and *WDL* – though some are losing momentum. The product catalogue appears to be well-balanced and covers all game categories.

Results

US\$m	9 mths 2001	% of sales	9 mths 2000	% of sales	% change
Sales	60.7		74.9		-19.0%
Operating profit	-52.7	-86.8%	-11.0	-14.7%	nm
Net profit	-55.2	-90.9%	-11.3	-15.1%	nm

Source: Company data

3DO's sales for the first nine months of 2001 were down 19.0% to US\$60.7m from US\$74.9m in 2000. This fall was due primarily to a reduction in sales for PCs and the Nintendo 64, partly offset by sales for the Playstation and Gameboy Colour.

The change in the product mix in favour of consoles led to a fall in gross margins from 64% to 43% at end December 2000. Development for new-generation consoles and substantial TV advertising costs led to a 33.6% rise in operating costs to US\$78.8m. The operating margin consequently dropped from -14.7% to -86.8% and the net margin from -15.1% a year ago to -90.9%.

Strategy

Sharp increase in R&D expenditure

R&D expenses

	1999	2000	2001			
			Q1	Q2	Q3	9M
Sales growth	+23%	+155%	-40%	+11%	-27%	-19%
Growth in R&D expenses	+35%	+32%	+46%	+25%	+38%	+36%
R&D/sales	54%	28%	143%	51%	43%	58.9%

Source: Company data

The company's repositioning in 1997 forced it to invest massively to shift production to games software.

Between 1995 and 1998, the company sought first to shift into software by selling its graphics process and operating licences then by buying small US development studios. From 1998 the company quickly refocused on the Playstation and PC markets which then formed its main sources of revenue. After having changed its core business the company now has to navigate the transition to a new generation of consoles. 3DO had released 10 PS2 titles by end March 2001.

But 3DO's distribution network does not appear to be large enough to hold its own against Electronic Arts or Activision on the US market (20,000 direct sales outlets in the US). Europe seems to be the next major stage in 3DO's expansion. At the beginning of 1999, 3DO opened a subsidiary in the UK to roll out a European distribution network. 3DO opened a website, Store.3DO.com in February 2000 to supplement its physical distribution network. This allows users to download games directly to their PCs.

Outlook

The new funds which 3DO has raised via a share issue and by securing a new line of credit will enable it readily to meet future financing requirements. 3DO's future holds two important challenges: expanding the distribution network nationally and internationally, and developing games for new-generation consoles. These will require large amounts of cash for both development and marketing.

Strengths and weaknesses

Strengths	Weaknesses
Healthy financial position for funding new developments	No hits during the past two years
Successful conversion strategy is evidence of management's competence	Sales are concentrated on a few products
The product catalogue is resolutely focused on new consoles	Profitability is very fragile
A strong new licence for <i>High Heat Baseball</i>	International distribution network needs to be developed
	Strong licences have already been proven.

Source: SG Cowen

European video games convertibles: a real alternative to the underlying shares?

As our equities analyst believes there is still a risk of bad newsflow in the video games sector, assigning a positive recommendation on the sector but only on a medium-term perspective, we believe investment in the sector's convertibles to be a genuine alternative to the underlying shares.

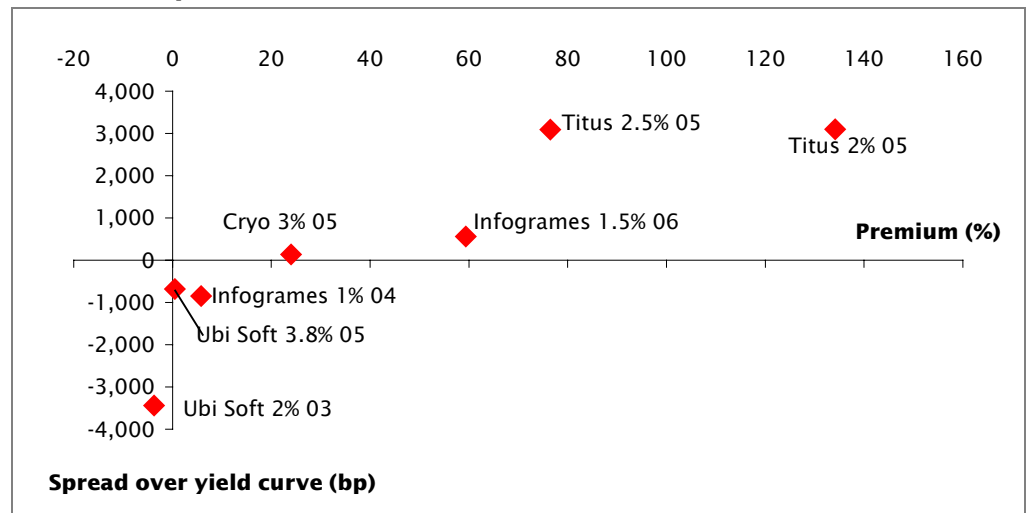
Note that among the underlying shares of all the European video games convertibles are rated Hold, which increases the attractiveness of investing in a hybrid instrument such as convertibles.

Technical profiles, 14 May 2001

Name	CB price (EUR)	Share price (EUR)	Premium (%)	YTM (%)	Spread / curve (bp)	Current yield (%)	Theoretical delta	Call date
Cryo 3% 05	38.0	7.7	24.0	6.2	133	3.0	0.7	Jan-03
Infogrames 1% 04	109.7	20.7	5.8	-3.8	-848	0.8	0.8	Jul-02
Infogrames 1.5% 06	33.0	20.7	59.4	10.4	561	1.9	0.3	May-01
Titus 2% 05	17.2	7.3	134.2	35.8	3,096	8.1	0.5	Jul-03
Titus 2.5% 05	53.3	7.3	76.5	43.1	3,093	5.7	0.3	May-01
Ubi Soft 2% 03	208.4	43.3	-3.7	-29.8	-3,443	0.9	1.0	May-01
Ubi Soft 3.8% 05	211.0	43.3	0.5	-1.9	-679	3.0	0.7	Jul-01

Source: SG Securities

Risk/return profile



Source: SG Securities

Early redemption: Ubi Soft 2% 03

As shown in the figure above, the Ubi Soft convertible issued in 1997 now has a purely 'equity' technical profile, with negative premium and yield to maturity. In accordance with the early redemption provisions of the issue prospectus, the issuer has just called this convertible from 21 May 2001. Between 21 May and 20 August 2001, the bearer may opt for either:

- Redemption in cash at EUR91.1.
- Conversion into shares at the ratio of 5 shares for each convertible, or the equivalent of EUR216.5 on 14 May.

Ubi Soft 3.8% 05: a call provision exercisable from July 2001!

Issued in 1998, this second Ubi Soft convertible also has an 'equity' technical profile and could be called under early redemption provisions from July onwards. The prospectus states that the issuer may trigger the call provision if the share price exceeds EUR42.8 at that date - the current share price is over EUR43.

Infogrames: we prefer the 1.5% 2006

Our analyst expects the sector to recover only as of 2002 and estimates that the new generation consoles will not be available before Christmas 2002. Bearing this in mind, the **Infogrames 1% 2004** is not only insufficiently protected to the downside but an issuer call from July 2002 onwards could deprive the investor of the full benefits of the sector's long-awaited upturn. The chances of this call being exercised are high, since the trigger is close to the present share price at EUR21.7.

The **Infogrames 1.5% 2006** has a risk/return profile more in keeping with our analyst's expectations for the sector and a call provision that could only be activated if the price of the underlying rose considerably. The trigger is set at 250% of the redemption price in 2001 and 2002, meaning that the share would have to appreciate 364% before 1 January 2002 for the issuer to be able to redeem early. This leaves the investor with generous potential on the upside.

Thanks to a yield to maturity of over 10% and a delta of 0.41, this convertible now offers very defensive convexity: for every +20%/-20% variation in the share price, the convertible will vary +6.5%/-5.4%. If we take account of an implicit spread of 900 basis points over Euribor, its floor is only 11% from its present price. Moreover, its implied volatility at 45% is reasonable against its 100-day historical volatility of 65%.

That said, the Euribor +900bp level looks exaggerated in respect of the risk profile on the underlying. As with all high-yield convertibles, we believe that the (expected) increase in the underlying will have a particularly strong impact on the market's perception of the issuer's credit quality. The convertible's sensitivity to a rise in the share price will therefore be much greater than today's theoretical delta of 0.41 suggests.

The correlation between the underlying and credit quality

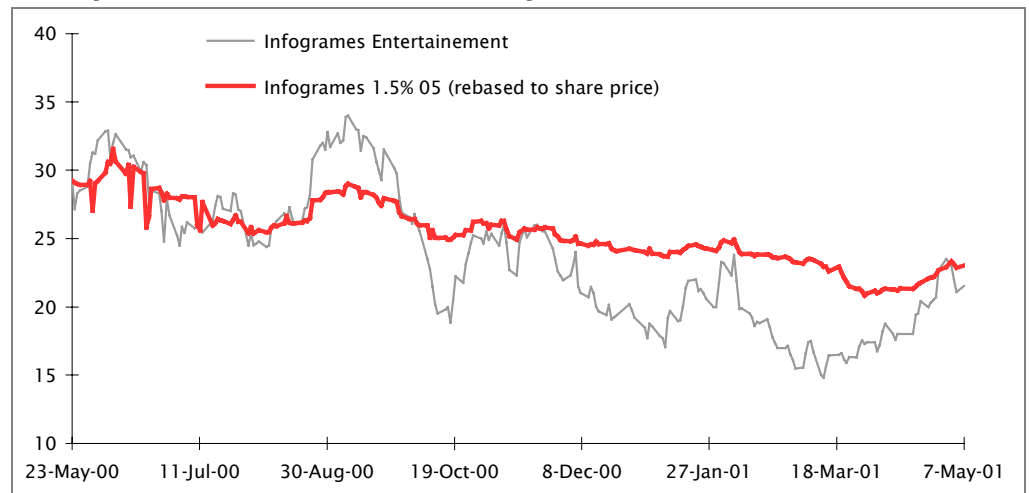
Share price (EUR)	20.7	22.77	24.84	26.91	28.98	31.05	33.12	35.19	37.26	39.33	41.4
Change in share price		10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Credit quality (bp/Euribor)	900	750	630	530	440	380	330	290	250	250	250
Theoretical value (EUR)	33.5	35.4	37.3	39.29	41.42	43.09	45.1	46.38	48.28	49.62	50.98
Change in theoretical value		6%	11%	17%	24%	29%	35%	38%	44%	48%	52%

Source: SG Securities

As the above table shows, we would expect a 20% increase in the share price to result in a 270bp reduction in the issuer credit spread. This would indicate an 11% rise in the convertible's price rather than the 6.5% given by the conventional convexity calculation.

This correlation between the underlying and the credit quality specific to high-yield convertibles therefore offers the convertible holder considerable potential upside.

Note that the Infogrames 1.5% 2005 also offers an attractive return relative to the issuer's share, with a current yield of 1.89% against no dividend payment on the underlying.

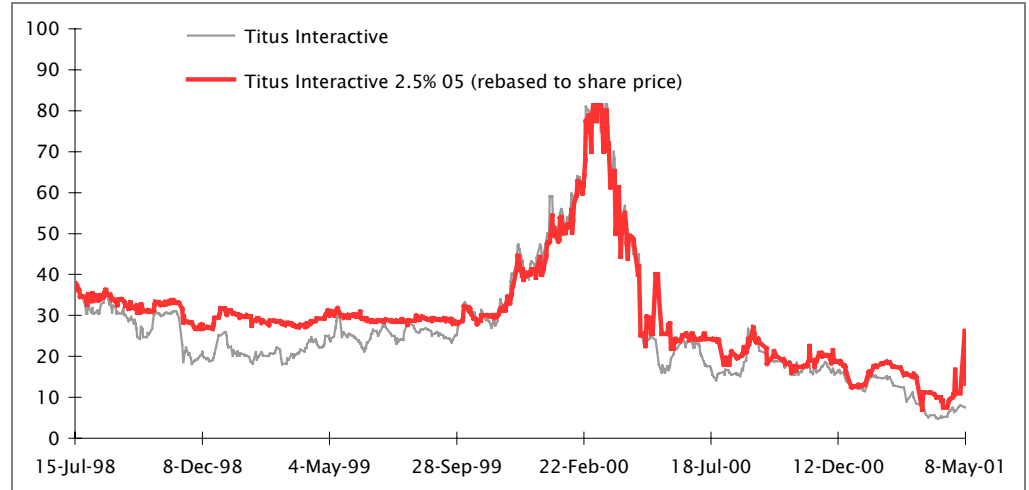
A comparison of share and convertible prices since issue


Source: SG Securities

Titus: opt for the 2% 2005

Titus Interactive 2.5% 05: too illiquid

A comparison of share and convertible prices since issue

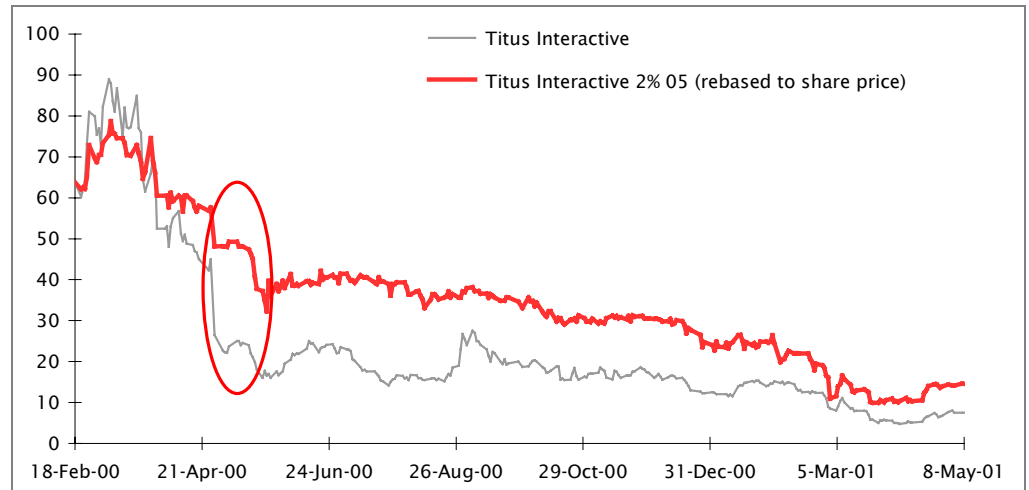


Source: SG Securities

While the lower premium on this old convertible relative to the new argues in its favour, only 45% of its original outstandings remain in circulation. Its liquidity is very poor as a result.

Titus Interactive 2% 05: a real delta close to 0.8 for a yield to maturity of 36%

A comparison of share and convertible prices since issue



Source: SG Securities

Following the announcement of an exceptional provision of EUR25m on 27 April 2000, the premium on this convertible widened sharply to above 130%. **Theoretically**, this leaves little scope for any notion of share price sensitivity. In practice, this is not the case, since there is **a certain correlation between the price of the underlying and credit quality** among high-yield convertibles.

At 5,100bp over Euribor, the market is now pricing this convertible as junk paper, i.e. valuing the borrow at close to default. At the same time, our equity analyst suggests that the share could recover and merits a Hold recommendation. Here again, an increase in the share price could prompt the market to revise its estimation of the issuer's credit quality and therefore boost the convertible and its valuation. In the case of this company, however, it would take a very significant rally in the share price to change the market's mind.

With this in mind, we assumed a 100% increase in the underlying (to EUR14.6) and calculated the spread would narrow by 2,000bp, which would of course still leave the issuer trading at a very poor 3,100bp over Euribor. Given these two admittedly strong hypotheses, the Titus 2% 2005 could rally 73%, giving us a **real** share price sensitivity of around 0.73, much higher than the theoretical level of only 0.1.

	Present level	Hypothetical scenario
Share price	EUR7.3	EUR14.6
Credit quality	5,100bp	3,100bp
Convertible		+73%

Source: SG Securities

As the company is in a delicate financial position and offers a non-negligible risk in terms of credit quality, we recommend that investors looking for exposure should **opt for the convertible rather than the share**. The former could offer a 73% participation in a recovery in the share price, along with a yield to maturity of 36% and a current yield of 8.1%!

Cryo Interactive 3% 05: insufficient liquidity

Only 71% of the convertibles issued in 1999 are still in circulation. The liquidity of this bond was limited by its size (EUR20m) right from the start and is now practically non-existent. Only 600 Cryo Interactive 3% 05 convertibles have been traded since the start of this year.

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