Value Creation at Vodafone

Abstract

Vodafone began life in 1984 as the telecom subsidiary of Racal Electronics. Vodafone has used merger and acquisition to build a global business. The case describes the Mannesmann acquisition in 2000 and the strategic landscape at the time. It then tracks Vodafone's subsequent performance to 2009. The case asks what Vodafone's strategic options were, and whether achieving global dominance by acquisition is likely to be a game worth winning, from the perspective of shareholders.

This case was prepared in 2009 by Professor Chris Higson. The case was prepared from publicly available information, as a basis for class discussion rather than to illustrate either the effective or ineffective handling of an administrative situation.

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London Business School reference
CS 09-009

History of Vodafone and Mannesmann

Vodafone started life as a subsidiary of Racal Electronics. In 1988 twenty percent of the stock of Racal's Telecom Division was floated on the London and New York Stock Exchanges and in September 1991, Racal Telecom was demerged fully from Racal Electronics and renamed Vodafone Group. Vodafone then grew energetically through alliances and acquisitions.

In mid-1999 Vodafone merged with AirTouch Communications Inc. of the US to create Vodafone AirTouch. AirTouch already had a number of tie-ups with Mannesmann in Europe including 34.8% of D2, where Mannesmann had 65.2%, and 17.8% of Omnitel Pronto Italia, where Mannesmann had 37.5%.

By the end of September 1999, Vodafone AirTouch Plc had over 31 million customers worldwide, and interests in 24 countries across five continents[1]. Vodafone had long been the largest UK operator. In September 1999, Vodafone AirTouch announced a 45% stake in a planned joint venture with Bell Atlantic that would cover more than 90% of the US population and be the largest wireless operator in the US. This subsequently emerged as Verizon Wireless on 3rd April 2000.

In November 1999, Vodafone AirTouch had a market capitalization of approximately £90 billion, equivalent to €140 billion, and was the second largest company in the FTSE 100, and third in the Euro Top 300. The company was recognised as one of the top 25 companies in the world.

Mannesmann was an engineering business with roots back to 1890. Reconstructed after the Second World War, it developed from a large steel and coal manufacturer into an increasingly unfocussed conglomerate, acquiring businesses in automotive components, measurement and control engineering, information technology, and plastics.

In 1991, Mannesmann launched Mobilfunk (later 'D2') with technical support from AirTouch. In 1996, the success of this businesses inspired Mannesmann, in a partnership including Deutsche Bank and AT&T, to acquire the fixed line subsidiary of Deutche Bahn. This business was named Mannesmann Arcor. Mannesmann later acquired interests Cegetel France and tele.ring in Austria and, in 1999, majority stakes in the Italian mobile and fixed line operators Omnitel and Infostrada. In October 1999 Mannesmann paid Hutchison Whampoa £20 billion for its 44.82% stake in Orange, making Mannesmann Europe's largest mobile network operator.

The economics of takeovers, friendly and hostile

Economists have spent a lot of time studying takeovers. One lesson, shown in many studies, is that only selling shareholders reliably make money in a takeover. The acquirer is unlikely to increase its shareholders' wealth – typically just 30% of acquisitions leave the acquirer better off. There are two main reasons for this. One is the timeless tendency to be too optimistic – to overestimate the synergies and enormously underestimate the challenges of post-merger integration. The other is the simple economics of an auction. There is usually more than one potential acquirer, and even if there is no rival to start with, it is in the selling firm's interests to find one. That way the price gets bid up until most or all of the synergy value gets captured by the seller.

Another lesson is that hostile and friendly takeovers have different economics. The resistance of management and the frequent presence of a counter bidder means you tend to pay a higher price in a hostile bid. On the other hand you may expect to get more synergies. Cost-cutting is more energetic after a hostile takeover and you do not feel sentimentally attached to preserving the status quo. Presumably the worse of both worlds would be to pay a hostile price, but agree friendly terms.

Vodafone's bid for Mannesmann

Friendly?
There had been a long history of collaboration between Vodafone and Mannesmann, involving joint ventures in a number of territories. There was a general view that these were firms that might merge in the future. But the relationship soured overnight when on October 20th 1999 and apparently without warning, Klaus Esser, Chairman of Mannesmann, bid for Orange plc, a competitor of Vodafone in the UK. Chris Gent, Vodafone's CEO, concluded that Mannesmann were planning to compete with him head on.

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[1] In Europe this included controlling or minority stakes in Germany, France, Italy, Spain, Portugal, Sweden, Belgium, Greece, the Netherlands, Romania, Poland, Malta and, shortly, Hungary. Vodafone AirTouch had interests in Egypt, South African and Ugandan and, in Asia, had networks in Australia and New Zealand and interests in Fiji, India, Japan and South Korea.

Vodafone immediately set about preparing a bid for Mannesmann. On November 19th Vodafone offered Esser 53.7 Vodafone AirTouch shares for each Mannesmann share, the largest unsolicited takeover bid in history. Based on Vodafone's closing price on 18 November of £2.85, this valued each Mannesmann share at €240 and the Mannesmann group at €124 billion (£78 billion). This offer represented a significant premium to Mannesmann's closing price of €143, a month before. In comparison, the market capitalisation of Vodafone AirTouch on 18 November was £89 billion, equivalent to €141 billion.

Hostile

Mannesmann management advised shareholders to refuse the offer, saying it valued itself at over €350 per share, a significant increase over the share price of €157.8 when it had bid for Orange.

Through November and December Vodafone AirTouch ran a major shareholder relations campaign in continental Europe, the United States and the UK, to explain the rationale for Vodafone's bid and to invite feedback from shareholders. Commentators noted that Vodafone's campaign was far better organized than the ad-hoc response Mannesmann.

On December 23, Vodafone went hostile. That is, they put the same offer direct to Mannesmann's shareholders. Mannesmann attempted, but failed, to get an injunction restraining Goldman Sachs from acting on behalf of Vodafone.

Vodafone's bid had sparked an outcry in Germany from politicians, labour unions, and in the press. Amongst others, Federal Chancellor Gerhard Schroeder and Wolfgang Clement (Prime Minister of North-Rhine Westphalia) expressed their unease.

"Rhenish capitalism becomes more Anglo-Saxon, and thus more unpleasant," said *Süddeutsche Zeitungdqw*. "Businesses will be less under the control of their supervisory boards and the banks, and more directly determined by the capital market; the voices of politicians and workers' delegates will be diminished, those of fund managers and analysts amplified. For company executives, hectic times have set in."

On January 10th 2000, Dr Esser met the Chief Executive of Vivendi and two weeks later began talks with AOL Europe; though there was no evidence that either of these were merger talks. A week later still, Vodafone announced that it would increase its offer price if Esser agreed to enter friendly talks. Then Vodafone also approached Vivendi and on January 30th they announced a joint mobile/internet portal venture. In addition, Vodafone offered Vivendi half of Mannesmann's 15% share of the French fixed line firm Cegetel and agreed not to take a stake in Vivendi for 36 months without agreement. The Vodafone/Vivendi tie up came as a complete surprise to Klaus Esser.

The cost of the friendly deal

When it became clear that Vodafone's hostile takeover might succeed, the Mannesmann management changed its position. On February 4, 2000, the board of directors and the supervisory board of Mannesmann capitulated and advised shareholders to exchange their shares for 58.964 Vodafone shares giving them a 49.5% stake in the new business. Vodafone AirTouch would pay €353 per share, valuing the German company at approximately $180 billion, an increase of almost 75% from Gent's first offer.

The new firm would have a market capitalization of $350 billion and, by value, be the fourth largest company in the world, after Microsoft, GE and Cisco. Of course in terms of employees, sales and profits there were many bigger – in Germany, for example, the chemical company Bayer had five times the workers globally, three times the sales and one-and-a-half times the profits; but its market capitalization was $30bn.

It was claimed that Mannesmann and Vodafone together spent some $1 billion on advertising and advisory fees during the battle.

The earlier protests disappeared. Both Schroeder and Clement now welcomed the agreement. In the UK, Vodafone had not recognized any trade unions. On 24 November 1999, Chris Gent, had published an "open letter" to the Mannesmann workforce saying that a merger would not mean additional job losses. On 10 February 2000, Gent met Mannesmann employee representatives in order to underline that Vodafone would fully accept the corporate culture at Mannesmann including the principle of co-determination through employee representatives on the Mannesmann supervisory board. After considering the new terms of the takeover deal, the president of the IG Metall metalworkers' union and deputy chair of the Mannesmann supervisory board, Klaus Zwickel, declared that the employee side would now be able to accept the merger.

The new company would be called Vodafone Airtouch, although the Mannesmann name will be retained in Germany. Düsseldorf would be retained as one of two European headquarters; responsible for the existing continental European mobile and fixed-line telephone business. It seemed that Esser had been able to sell part of

this vision to Gent, who decided to maintain the integrated fixed-line and mobile activities of the merged company.

Esser had strenuously rejected Vodafone's offer, but now recommended the deal. A few days later, it was announced that Esser would resign but receive around Dm60m, comprising basic pay and bonuses to 30 June 2004, when his existing contract ran out (Dm15.2m), a special bonus of nine years' salary (Dm12.6m), and an 'appreciation award' of Dm31.1m. Hans-Olaf Henkel, the president of the Confederation of German Industries, justified this, arguing that salaries of German managers were far below those of foreign colleagues.

Subsequently
Vodafone immediately announced that it was looking for other acquisitions, especially in Asia. It was trying to buy Spain's Airtel mobile phone company, was talking to other internet companies about possible alliances, and might talk to content providers such as News Corporation, the Times, and BSkyB.

On 12 April 2000 the EU Commission gave Phase 1 clearance for its acquisition of Mannesmann AG, attaching no burdensome conditions. The EU ruled that Vodafone must immediately sell Orange, and that Vodafone must open its networks to competitors for three years. France Telecom had already expressed a firm interest in buying Orange. Vodafone shares rose 2.8 percent to 322 pence immediately after the Commission decision, lifting its valuation to £200 billion ($344 billion) and making it by far Europe's largest company by market capitalization.

The Commission's ruling also opened the way for a final decision on the fate of Atecs, Mannesmann's electronic components business. In late February 2000 Vodafone announced that Mannesmann had reached an agreement with Siemens AG and Robert Bosch GmbH on the disposal of a 50% plus 2 shares stake in Atecs. The transaction valued Atecs at approximately EUR 9.6 billion. Later in the year Mannesmann tubes business was sold for an undisclosed sum. In due course, Gent intended to float minority interests in Arcor and Infostrada, both to realise value and to motivate management in these businesses. Orange was also subsequently sold in 2000 to France Telecom in a deal worth around £31 billion, creating Europe's second largest mobile phone group.

Separately, Vodafone topped the bidding for the five UK third-generation mobile-phone operating licenses. It bid £4.55bn for the B license, which offers the broadest spectrum of the five licenses up form sale. Orange topped the bidding for the E license, with a £3.35bn offer.

The Strategic Challenge

How did the world look in 1999? The new third generation (3G) rollout was expected in Japan in 2002, and in Europe then the US by 2003. This would enable a new generation of internet applications and high bandwidth services and might lead to the convergence of the mobile telecoms, multimedia and internet sectors. Vodafone and Mannesmann both shared this vision, though Esser also believed fixed line to be a crucial part of the mix. But this all posed challenges:

- It could spark a scramble for control of the strategic assets needed to become dominant players in the multimedia world.
- There was also the risk that once the US caught up with, and became compatible with everyone else in terms of technology, large US companies would go hunting for global acquisition targets.
- The strategic pressure was heightened the enormous expected cost of 3G licences – for example, some analysts predicted Vodafone would need to pay €30bn to €40bn for licenses to cover their existing territories. These high costs would place further demands on network operators to capture a share of emerging data services, requiring economies of scale and making it increasingly difficult for small operators to remain independent.
- Leaving aside the 3G issues, while mobile growth remained strong, many territories were becoming increasingly competitive, and increasingly saturated, with penetration over 75% in a number of developed markets. The focus was increasingly on customer retention, and on average revenue per user (ARPU), as a way of protecting margins.

So this was a period of extreme strategic anxiety in the mobile telecoms industry. Perhaps only a few large global businesses would survive. The survivors could build global brands. They could achieve significant purchasing economies for infrastructure, IT and handset procurement, and savings network running costs. (In the case of Vodafone/Mannesmann, management forecast synergies of £600m a year by 2004). So for leaders such as Chris Gent at Vodafone the future might have looked like eat or be eaten.

Some questions

Was that actually the future, and at what price?

A decade on, we are allowed to use hindsight to assess Vodafone's strategy. The first question is, did the vision described in the previous section correctly described the future? Secondly, if it was to be the future, was the strategy Vodafone followed its only option?

Even if the answer to both questions is yes, is this a game worth winning, from the perspective of shareholders? The annexes to the case track the share price performance of Vodafone over the period 1999 to 2008, with the FTSE and Telenor as comparators. How has Vodafone done for investors?

Measuring performance

The annexes to this case present Vodafone's financial statements for the years 1999 to 2009. How profitable has Vodafone been, in terms of margin and return on capital[2]? It is tempting to follow industry practice and focus on EBITDA. EBITDA is a useful input in comparative performance measurement, but its danger when assessing value creation for investors is that it omits the cost of acquisition.

Like all European listed companies, Vodafone adopted IFRS from 2005. Previously, under UK GAAP, it could amortize its goodwill, subject to an impairment review if needed. Under IFRS it must carry goodwill unamortized, and do an annual impairment review. Arguably this gives a balance sheet that measures the fair value of the resources the firm is using period by period, and an income statement that measures the economic cost of consuming those resources. Under either GAAP, almost every year since Mannesmann, Vodafone's P&L was swamped by impairment charges on its intangibles.

In 2007:

- What proportion of total assets are intangible?
- What are these intangibles?
- What did the impairment relate to this year?
- What triggered the impairment review?
- How does Vodafone calculate impairment? What cash flows are used? What discount rate? (Note 10)

Vodafone uses 'adjusted' operating profit in its narrative. How does this relate to the GAAP version?

[2] As a benchmark one might assume a cost of equity capital of 10%, and a weighted average cost of capital (WACC) of 8%.

Vodafone Income Statements

Income Statement (£m)	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sales	**3,360**	**7,873**	**15,004**	**22,845**	**30,375**	**33,559**	**26,678**	**29,350**	**31,104**	**35,478**	**41,017**
Cost of sales	(1,809)	(4,359)	(8,702)	(13,446)	(17,896)	(19,461)	(15,800)	(17,070)	(18,725)	(21,890)	(25,842)
Gross profit	**1,551**	**3,514**	**6,302**	**9,399**	**12,479**	**14,098**	**10,878**	**12,280**	**12,379**	**13,588**	**15,175**
Selling and distribution expenses	(243)	(869)	(1,162)	(1,457)	(1,883)	(2,079)	(1,649)	(1,876)	(2,136)	(2,511)	(2,738)
Administrative expenses	(461)	(1,664)	(11,579)	(18,319)	(15,891)	(16,795)	(3,331)	(26,931)	(15,037)	(3,878)	(10,671)
Non-operating and other	66	954	80	(860)	(5)	(103)	(7)	13	506	226	(44)
Associates income	116	(185)	(559)	(1,457)	(156)	546	1,980	2,428	2,728	2,876	4,091
goodwill impairment				*(4,353)*			*(475)*	*(23,515)*	*(11,600)*		*(5,650)*
intangible impairment											*(250)*
tangible assets impairment			*(40)*								
associate impairment			*(7)*	*(706)*	*(80)*						
goodwill amortisation	*(8)*	*(674)*	*(9,585)*	*(10,962)*	*(11,875)*	*(13,095)*					
intangible amortisation	*(7)*	*(12)*	*(24)*	*(34)*	*(53)*	*(98)*	*(1,516)*	*(1,625)*	*(2,100)*	*(2,482)*	*(2,753)*
tangible assets depreciation	*(282)*	*(746)*	*(1,593)*	*(2,880)*	*(3,979)*	*(4,362)*	*(3,999)*	*(3,079)*	*(3,011)*	*(3,427)*	*(4,061)*
associate goodwill amortisation			*(2,292)*	*(2,461)*	*(2,141)*	*(2,065)*					
profit/(loss) disposal PPE					*3*	*19*	*(162)*	*(88)*	*(44)*	*(70)*	*(10)*
	(297)	***(1,432)***	***(11,249)***	***(21,396)***	***(18,125)***	***(19,601)***	***(6,152)***	***(28,307)***	***(16,755)***	***(5,979)***	***(12,724)***
EBITDA	***1,326***	***3,182***	***4,331***	***8,702***	***12,669***	***15,268***	***14,023***	***14,221***	***15,195***	***16,280***	***18,537***
EBIT	**1,029**	**1,750**	**(6,918)**	**(12,694)**	**(5,456)**	**(4,333)**	**7,871**	**(14,086)**	**(1,560)**	**10,301**	**5,813**
Net financing costs	(94)	(401)	(1,177)	(845)	(752)	(714)	(586)	(767)	(823)	(1,300)	(1,624)
Profit before taxation	**935**	**1,349**	**(8,095)**	**(13,539)**	**(6,208)**	**(5,047)**	**7,285**	**(14,853)**	**(2,383)**	**9,001**	**4,189**
Income tax	(252)	(685)	(1,290)	(2,140)	(2,956)	(3,154)	(1,869)	(2,380)	(2,423)	(2,245)	(1,109)
Profit from continuing operations	**683**	**664**	**(9,385)**	**(15,679)**	**(9,164)**	**(8,201)**	**5,416**	**(17,233)**	**(4,806)**	**6,756**	**3,080**
Discontinued operations							1,102	(4,588)	(491)		
Minorities (incl non-equity)	(46)	(177)	(378)	(476)	(655)	(814)	(108)	(95)	(129)	(96)	(2)
Earnings	**637**	**487**	**(9,763)**	**(16,155)**	**(9,819)**	**(9,015)**	**6,410**	**(21,916)**	**(5,426)**	**6,660**	**3,078**
Earnings per share (pence)	4.1	2.0	(16.1)	(23.8)	(14.4)	(13.2)	9.7	(35.0)	(9.8)	12.5	5.8
Dividend per share (pence)	1.3	1.3	1.4	1.5	1.7	2.0	4.1	6.1	6.8	7.5	7.8

Vodafone Balance Sheets

Balance Sheet (£m)	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Goodwill	173	21,511	94,797	91,695	92,833	78,780	80,999	52,606	40,567	51,336	53,958
Other intangible assets	156	695	14,042	14,249	15,252	14,842	16,149	16,512	15,705	18,995	20,980
Property, plant and equipment	2,150	6,307	10,586	18,541	19,574	18,083	17,442	13,660	13,444	16,735	19,250
Investments	372	122,338	34,950	28,977	27,030	22,275	21,415	25,316	26,102	29,912	41,775
Derivative financial instruments							364	231	224	831	2,458
Trade and other receivables				958	1,252	1,380	1,417	289	762	737	1,249
Non-current assets	**2,851**	**150,851**	**154,375**	**154,420**	**155,941**	**135,360**	**137,786**	**108,614**	**96,804**	**118,546**	**139,670**
Inventory	45	190	316	513	365	458	440	297	288	417	412
Trade and other receivables	741	2,138	4,095	6,095	6,208	5,521	5,158	4,367	4,964	6,547	7,490
Derivative financial instruments							44	79	80	61	249
Cash and equiv., investments	6	189	13,279	1,872	766	5,790	3,769	2,789	7,481	1,699	4,878
Current assets	**792**	**2,517**	**17,690**	**8,480**	**7,339**	**11,769**	**9,411**	**7,532**	**12,813**	**8,724**	**13,029**
Net assets held for sale								8,049			
Total assets	**3,643**	**153,368**	**172,065**	**162,900**	**163,280**	**147,129**	**147,197**	**124,195**	**109,617**	**127,270**	**152,699**
Equity shareholders' funds	815	140,833	145,393	130,573	128,671	111,924	113,800	85,425	67,067	78,043	86,162
Minority interests	109	1,527	2,389	2,855	2,863	3,007	(152)	(113)	226	(1,572)	(1,385)
Total shareholders' funds	**924**	**142,360**	**147,782**	**133,428**	**131,534**	**114,931**	**113,648**	**85,312**	**67,293**	**76,471**	**84,777**
Long term borrowings	1,137	6,038	10,772	12,584	13,175	12,224	13,190	16,750	17,798	22,662	31,749
Derivative financial instruments							48	148	156	173	398
Trade and other payables	52	529	1,134	3,433	4,278	4,948	5,694	6,473	5,424	5,991	7,828
Non-current liabilities	**1,189**	**6,567**	**11,906**	**16,017**	**17,453**	**17,172**	**18,932**	**23,371**	**23,378**	**28,826**	**39,975**
Short term borrowings	377	794	3,611	1,319	1,430	2,054	2,003	3,448	4,817	4,532	9,624
Derivative financial instruments							31	71	63	371	37
Trade and other payables	1,153	3,647	8,766	12,136	12,863	12,972	12,583	11,993	14,066	17,070	18,286
Current liabilities	**1,530**	**4,441**	**12,377**	**13,455**	**14,293**	**15,026**	**14,617**	**15,512**	**18,946**	**21,973**	**27,947**
Total equity and liabilities	**3,643**	**153,368**	**172,065**	**162,900**	**163,280**	**147,129**	**147,197**	**124,195**	**109,617**	**127,270**	**152,699**
Share price (at year end; pence)	230.2	348.5	193.0	129.8	112.3	128.8	140.5	120.5	135.5	150.9	122.8
Number of shares (at year end; m)	15,497	61,334	65,013	68,141	68,179	67,464	64,596	60,119	52,835	53,123	52,484
Market capitalisation (at year end)	35,674	213,749	125,474	88,413	76,579	86,860	90,757	72,443	71,592	80,162	64,424

Vodafone Analysis

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sales	3360	7873	15004	22845	30375	33559	26678	29350	31104	35478	41017
Sales Growth		*134%*	*91%*	*52%*	*33%*	*10%*	*-21%*	*10%*	*6%*	*14%*	*16%*
Capital Employed at y/e	2432	149003	148886	145459	145373	123419	125072	102721	82427	101966	121272
EBITDA	1326	3182	4331	8702	12669	15268	14023	14221	15195	16280	18537
EBIT	1029	1750	-6918	-12694	-5456	-4333	7871	-14086	-1560	10301	5813
EBIAT	749	945	-8561	-15088	-8638	-7701	5826	-16696	-4230	7666	4249
Earnings	637	487	-9763	-16155	-9819	-9015	6410	-21916	-5426	6660	3078
VALUE METRICS											
ROCE	42.3%	1.2%	-4.6%	-8.6%	-3.8%	-3.2%	6.3%	-12.4%	-1.7%	11.2%	5.2%
After tax ROCE	30.8%	0.6%	-5.7%	-10.3%	-5.9%	-5.7%	4.7%	-14.7%	-4.6%	8.3%	3.8%
Return on Equity	68.9%	0.3%	-6.7%	-11.5%	-7.4%	-7.3%	5.6%	-22.0%	-7.1%	9.3%	3.8%
Economic Profit	554	-10976	-20477	-26861	-20271	-18453	-4113	-25808	-11636	290	-4680
FORENSICS											
EBIT Margin	30.6%	22.2%	-46.1%	-55.6%	-18.0%	-12.9%	29.5%	-48.0%	-5.0%	29.0%	14.2%
EBITDA Margin	39.5%	40.4%	28.9%	38.1%	41.7%	45.5%	52.6%	48.5%	48.9%	45.9%	45.2%
Asset turn	1.38	0.05	0.10	0.16	0.21	0.25	0.21	0.26	0.34	0.38	0.37
INVESTOR RETURN											
Operating Free Cash Flow	(152)	(3,091)	(46,309)	(4,436)	762	7,357	6,061	3,888	13,610	1,420	6,492
Equity free cash flow/share (pence)	.6	.0	(81.7)	(14.1)	.1	11.3	5.9	13.3	32.6	(4.9)	14.8
Dividend per share (pence)	1.3	1.3	1.4	1.5	1.7	2.0	4.1	6.1	6.8	7.5	7.8
Share price (pence)	230.2	348.5	193.0	129.8	112.3	128.8	140.5	120.5	135.5	150.9	122.8
Stock Return		52.0%	-44.2%	-32.0%	-12.2%	16.5%	12.3%	-9.9%	18.1%	16.9%	-13.5%

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Vodafone Stock Price, vs FTSE100

Telenor Stock Price, vs FTSE100

Appendix – Vodafone, some goodwill and impairment disclosures

2002

"[Under UK GAAP] For acquisitions made after the financial year ended 31 March 1998, goodwill is capitalised and held as a foreign currency denominated asset, where applicable, and is thus subject to exchange rate fluctuations. In the event of impairment, a charge is made to the profit and loss account in the period in which the impairment occurs, with a corresponding write down in the carrying value of goodwill. Once capitalised, goodwill is amortised on a straight-line basis over its estimated useful economic life. For goodwill related to cellular network businesses this is the shorter of the unexpired period of the licence under which the network operator provides telecommunications services or twenty-five years. For other acquisitions, including customer bases, the amortisation period for goodwill is typically between five and ten years.

At 31 March 2002, goodwill, including that attributable to the acquisition of interests in associated undertakings, amounted to £116,665 million, … Applying the lives referred to in the previous paragraph has resulted in this year's charge for amortisation amounting to £13,470 million."

Goodwill amortisation	10,962
Fixed asset investments goodwill amortisation	2,461
Share of goodwill amortisation JVs & assoc.	47
	13,470

Impairment charges were found to be required in respect of the Group's non-controlled mobile and non-mobile businesses, but not in respect of its controlled mobile businesses, as follows:

Company	£m
Arcor	4,000
Japan Telecom	400
Cegetel	250
Grupo Iusacell	450
China Mobile	900
Total	6,000

2006

"The impairment losses recognised in the income statement, as a separate line item within operating profit, in respect of goodwill are as follows:

	2006	2005
	£m	£m
Germany	19,400	–
Italy	3,600	–
Sweden	515	475
	23,515	475

Germany and Italy

The carrying value of goodwill of the Group's mobile operations in Germany and Italy, with each representing a reportable segment, has been impaired due to Vodafone having revised its view of longer term trends for these businesses given certain developments in the current market environment. …The German market has seen recent intensification in price competition, principally from new market entrants, together with high levels of penetration and continued regulated reductions in incoming call rates. …In Italy, competitive pressures are increasing with the mobile network operators competing aggressively on subsidies and, increasingly, on price. …The impairment losses were determined as part of the annual test for impairment and were based on value in use calculations using the pre-tax risk adjusted discount rates disclosed on page 92.

Sweden

The impairment of the carrying value of goodwill of the Group's mobile operation in Sweden in the years ended 31 March 2006 and 2005 resulted from fierce competition in the Swedish market combined with onerous 3G licence obligations. Vodafone Sweden forms part of the Group's Other Mobile Operations, which is a reportable segment. …Prior to its disposal in the year in the year ended 31 March 2006, the carrying value of goodwill was tested for impairment at an interim date as increased competition provided an indicator that the goodwill may have been further impaired. The recoverable amount of the goodwill was determined as the fair value less costs to sell, reflecting the announcement on 31 October 2005 that the Group's 100% interest in Vodafone Sweden was to be sold for €953 million (£653 million). The sale completed on 5 January 2006.

In the year ended 31 March 2005, the impairment was determined as part of the annual test for impairment and was based on value in use calculations. A pre-tax risk adjusted discount rate of 9.7% was used in the value in use calculation.

Key assumptions used in the value in use calculations
The Group prepares and internally approves formal ten year plans for its businesses. For the year ended 31 March 2005, the Group used these plans for its value in use calculations. The plans included cash flow projections for the mobile businesses which were expected to have growth rates in excess of the long-term average growth rates, beyond an initial five year period, for the markets in which they operate.

In the year ended 31 March 2006, the most recent management plans have shown that the need to reflect a differing growth profile beyond an initial five year period has diminished in a number of the Group's key operating companies as the Group has revised its view of longer term trends. Accordingly, the directors believe it is now appropriate to use projections of five years for its value in use calculations, except in markets which are forecast to grow ahead of the long term growth rate for the market. At 31 March 2006, the value in use calculation for the Group's joint venture in India used a ten year plan reflecting the low penetration of mobile telecommunications in the country and the expectation of strong revenue growth throughout the ten year plan.

Budgeted EBITDA, calculated as adjusted operating profit before depreciation and amortisation, has been based on past experience adjusted for the following:

- voice and messaging revenue is expected to benefit from increased usage from new customers, the introduction of new services and traffic moving from fixed networks to mobile networks, though these factors will be partially offset by increased competitor activity, which may result in price declines, and the trend of falling termination rates;
- non-messaging data revenue is expected to continue to grow strongly as the penetration of 3G enabled devices rises and new products and services are introduced; and
- margins are expected to be impacted by negative factors such as an increase in the cost of acquiring and retaining customers in increasingly competitive markets and the expectation of further termination rates cuts by regulators; and by positive factors such as the efficiencies expected from the implementation of One Vodafone initiatives.

Budgeted capital expenditure The cash flow forecasts for capital expenditure is based on past experience and includes the ongoing capital expenditure required to provide enhanced voice and data products and services and to meet the population coverage requirements of certain of the Group's licences. Capital expenditure includes cash outflows for the purchase of property, plant and equipment and computer software.
Long term growth rate For mobile businesses, a long term growth rate into perpetuity has been determined as the lower of:

- the nominal GDP rates for the country of operation; and
- the long term compound annual growth rate in EBITDA implied by the business plan.

For non-mobile businesses, no growth is expected beyond management's plans for the initial five year period.

Pre-tax risk adjusted discount rate The discount rate applied to the cash flows of each the Group's operations is based on the risk free rate for ten year bonds issued by the government in the respective market, adjusted for a risk premium to reflect both the increased risk of investing in equities and the systematic risk of the specific Group operating company. In making this adjustment, inputs required are the equity market risk premium (that is the required increased return required over and above a risk free rate by an investor who is investing in the market as a whole) and the risk adjustment ("beta") applied to reflect the risk of the specific Group operating company relative to the market as a whole.
In determining the risk adjusted discount rate, management have applied an adjustment for the systematic risk to each of the Group's operations determined using an average of the beta's of comparable listed mobile telecommunications companies and, where available and appropriate, across a specific territory. Management have used a forward looking equity market risk premium that takes into consideration both studies by independent economists, the average equity market risk premium over the past ten years and the market risk premiums typically used by investment banks in evaluating acquisition proposals.

The following assumptions have been applied in the value in use calculations as follows:

	Pre-tax risk adjusted discount rate		Long term growth rate	
	2006	2005	2006	2005
	%	%	%	%
Germany	10.1	9.6	1.1	2.7
Italy	10.1	9.2	1.5	4.1
Spain	9.0	9.3	3.3	3.4