



## Telecom Sector

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Important disclosures  
appear at the back of  
this report

# Global to Local – Korea stands out



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## Part 1: Overview – Global Trends



# Overview

## Why Korean Telecom Co's stand out globally

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1. **Regulation** has resulted in consolidation and increased profitability for all the operators whilst at the same time to the benefit of consumers
2. **Korea is a leader** in broadband proliferation, both fixed and wireless
3. **The companies trade at significant discounts** to their global peer group. Therefore there is still value for investors to draw upon in the market



## Global View (1)

US is currently driving global telecoms on 3 issues

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1. **Weak mobile subscriber growth** – weak net additions in Q4 2001 initiated a global sell off
2. **Concerns over Broadband demand** – Carriers such as Global Crossing, Level 3, Williams Comm. and Qwest showing either weak numbers or severe financial problems
3. **Accounting (Enron)** – this makes everyone suspect and creates panic selling



# Global View (2)

## Changing dynamics depressing Telecom Co's

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- Mobile companies no longer as popular
  - Weak mobile subscriber growth in US and Germany in Q4
  - Mobile Data Growth showing little improvement
  - Conclusion: growth outlook now looks significantly lower
- Fixed Line companies looking more attractive
  - Growth profile of fixed line companies now similar to mobile, and broadband outlook could help
  - Fixed Line companies typically half the price of mobile
  - Fixed Line companies pay better dividends
- Valuations for Telecom companies (mobile + fixed) now looking rich compared to other industries
- **Growing preference for companies that return cash to investors rather than trying to “buy” new growth**



# Asian View (1)

## Upside is tempered at best in 2002

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- Four key issues for Asian Telcom companies:
  1. **Mobile data.** We expect mobile data to double in 2002, and represent the key hope for optimism as in end 1999/early 2000.
  2. **Equity Overhang.** We estimate equity issues to increase by 50%.
  3. **Regulatory risks** exist in most markets.
  4. **Free Cash Flow (FCF).** FCF is improving, but shareholder value is slow to match.
- We see 19% potential upside on a weighted average basis in 2002 for the Asia-Pacific telecom sector, and 13% for first six months.
- We believe most of the upside is in China and Korea



# Asian View (2)

## Telco sector no longer the high-growth sector

	P/E(X)			EPSgrowth (%)			PEG (%)		
	2001E	2002E	2003E	2001E	2002E	2003E	2001E	2002E	2003E
Energy	8.4	10.3	9.2	(19.3)	(17.6)	9.0	(0.4)	(0.6)	1.0
Materials	16.5	12.6	9.5	30.8	30.9	34.5	0.5	0.4	0.3
Industrials	25.0	17.8	15.0	0.1	46.0	21.3	250.0	0.4	0.7
Consumer discretionary	18.3	15.1	12.1	11.9	21.4	25.3	1.5	0.7	0.5
Consumer staples	18.5	15.3	12.6	0.8	20.9	21.1	23.1	0.7	0.6
Health care	20.7	20.1	16.4	(34.4)	3.4	22.9	(0.6)	5.9	0.7
Financials	17.9	14.5	11.9	6.9	23.2	21.7	2.6	0.6	0.5
Information technology	30.3	16.5	12.3	64.6	84.2	33.8	0.5	0.2	0.4
→ Telecommunications services	16.2	14.3	12.6	17.2	13.2	14.2	0.9	1.1	0.9
Utilities	11.8	11.5	10.4	10.5	2.5	12.5	1.1	4.6	0.8
<b>Average</b>	<b>18.4</b>	<b>14.8</b>	<b>12.2</b>	<b>8.9</b>	<b>22.8</b>	<b>21.6</b>	<b>27.9</b>	<b>1.4</b>	<b>0.6</b>

Source: MSCI, Goldman Sachs Research estimates.

- In the past, telcos have attracted a higher P/E and EV/EBITDA because the market was expecting higher growth from these companies.
- We now expect three-year 2002-2005 revenue CAGR of 7% for fixed line and 14% for mobile, EBITDA CAGR of 7% and 17%, and EPS CAGR of 17% and 34%.
- European revenue and EBITDA numbers are similar, but with lower EPS growth due mainly to balance sheet problems.
- We expect the Asia-Pacific telecom sector to have lower growth than the overall average in 2002 and 2003, thus its second-highest PEG ratio among the sectors in 2003.



## Part 2: US Telecom Trends



# US Telecom Trends (1)

## Poor Fundamental Outlook

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- Mobile Sector – subscriber growth slowing
- Fixed Line Sector – growth outlook is muted
- Broadband – should be promising, but operators reporting weak subscriber numbers and/or are experiencing severe financial problems.
- Enron debacle – accounting issues at the forefront of investors minds.
- Global Crossing – filed for Chapter 11



## US Telecom Trends (2)

### Dynamics of Fixed Line Operators

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- **Regulation.** Industry still struggling to resolve issues raised by AT&T breakup in 1984, Telecom Act of 1996
- Liberalization & overly free capital markets have resulted in **too much new competition**
- New competitors are now undergoing massive balance sheet restructuring. Equity shareholders are being wiped out in some case.
- **Incumbents (Bells) facing enormous pressure** from cable players, wireless operator, and DSL substitution. Net access lines are declining. However they are relatively defensive.
- **Long Distance – consolidation needs to occur.** Carriers will not all survive (especially given current concerns over Worldcom and Sprint's balance sheet).  
~~Best solution may be for incumbents to buy the LD carriers~~  
– but how/when?



## US Telecom Trends (3)

### Dynamics of Mobile Operators

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- **Key Metrics.** Penetration relatively low at 47%; MOU high at 350 min; pricing is low at \$0.12/min; avge ARPU \$55-60; churn 2.5-3.0%
- **Market is characterized by contract users** (prepaid less than 8%) on high usage national bucket plans (X minutes at low rate; thereafter higher rate). Tends to keep ARPU high and churn low.
- **At critical juncture** – higher penetration means attracting lower quality subscribers – is it worth it?
- **Competition too high** – 6 national carriers. Tariff erosion to continue, high marketing costs and capex unlikely to come down – at this rate carriers will never reach FCF break even!
- **Consolidation needed**, but buyers/sellers feel no pressure to move right now. Anti-trust concerns may limit degree of consolidation.
- **Mobile Data is not a reality.** SMS is barely used. 1xRTT/GPRS networks are being rolled out, services launched late 02.
- **Valuations Cheap, but rightly so?** Competition, balance sheet and cashflow concerns means no investor enthusiasm.



## US Telecom Trends (4)

### Pure Broadband companies not doing well

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- **Poor outlook** for US Competitive Local Exchange Carriers (CLECs) due to:
  1. Massive over-leverage;
  2. Potential (severe) equity dilution from re-capitalization.
- **Any comparables for Hanaro and Thrunet?** In terms of pure broadband plays more focused on residential, the best comparables for Hanaro and Thrunet would be McLeod USA and XO Communications, but both have announced restructuring that would wipe out 97% and 100% of the outstanding equity of the companies, respectively. XO has filed for chapter 11.
- **The only two major publicly listed CLECs that are doing well right now concentrate on the Business Market:**
  - a) Allegiance (ALGX) – Co-location focus - it rents facilities from the incumbents and other providers
  - b) Time Warner Telecom (TWTC) – less capital intensive because it leases much of its facilities from its parent, Time Warner which has local fiber/backbone fiber and conduit/rights of way through its cable assets.



## US Telecom Trends (5)

### Growth outlook not as high as expected

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- Demand growth remains strong - particularly broadband, data, and wireless, **but just not as strong as originally thought.**
- Elimination of marginal operators could help the industry, but many could be resuscitated via equity injection/debt reduction.
- No macro catalysts in the near-term, only competitive pressures and uncertainties.
- Positive macro events may help in 2H, but Telecom performance tends to lag overall economy
- Long term, sustainable, investment in Telecom probably won't occur until broad consolidation has occurred.



# Goldman Sachs View

## Fundamentals to get worse before better

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- **Things will get worse before they get better.** In an economic and market recovery, telcos are likely to under perform because of low cyclical and continuing industry pressures. Don't expect telco growth recovery for nine to twelve months. If economy picks-up mid-year '02, then telecom likely won't pick-up until year end. Q1'02 to be worse than Q4'01.
- **Telecom pick-up is slower, and smaller than overall economy.**
- **No major regulatory or legislative changes in '02.** Telecom framework in US is very fragmented, but no changes expected to help telcos.
- **Short term - Mobile and long distance are likely to outperform other Telecom stocks.** Mobile and long distance (Sprint, WorldCom) should see faster and bigger recovery due to higher relative exposure to the economy and prospects for future consolidation.
- **Long Term – outlook for Bells more promising due to DSL and Cashflow.** For the short term, the Bells (ILECs – including SBC and Verizon) appear have performed their defensive role, and that strategy has probably played itself out, unless there's another market downturn. But the long term outlook is more positive due to ongoing DSL potential. All Bells expected to be FCF positive by YE2003, pay attractive dividends and conduct share buy backs. Bell companies have higher margins because they are not exposed to the Long distance market.
- **Consolidation further off.** Mobile and Long Distance sectors desperately need consolidation, but not likely soon. Consolidation of the 6 national mobile operators may be sooner than the 4-5 Long Distance players. Re-inforces preference for the Bells.







## European Telecom trends (1)

### Overall outlook

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- **Balance Sheet problems (3G License cost) now largely over**, except for the new entrants.
- **Fixed Line – “safe growth outlook”**. Growth in cashflow expected from capex and operating cost reductions. Competitive pressures expected to continue declining leading to pricing and market share stability.
- **Mobile – “risky growth outlook”**. No evidence yet to suggest strong growth outlook for wireless data – risk that mobile stocks could fall
- **What is an attractive telecom company?** Investors shifting their focus to those companies with strong cashflow and/or value-creating growth



# European Telecom Trends (2)

## Dynamics of fixed line operators

- Fixed Line outlook: flat revenues, but strong free cash flows.

- Revenue growth relatively slow
- Alternative carrier threat reduced
- Operating cost control has the potential to improve
- Margins have the potential to stabilise
- UK competitive dynamics remain intense
- Capex to sales in domestic fixed has the potential to fall further
- Risks in regulation and future technology change such as VoIP

Domestic Fixed	Revenue	Opex	EBITDA margin			
	CAGR 02-05E	CAGR 02-05E	2001E	2002E	2003E	2004E
BT Group	0.9%	1.1%	23.5%	21.8%	21.4%	21.2%
Deutsche Telekom	1.5%	2.2%	30.5%	31.8%	31.3%	30.9%
France Telecom	0.9%	2.7%	37.5%	36.5%	35.0%	33.5%
KPN	-2.6%	-2.2%	34.8%	37.0%	37.2%	36.9%
Portugal Telecom	-0.5%	0.9%	42.5%	41.5%	40.5%	40.0%
Swisscom	0.5%	0.4%	27.2%	27.3%	27.5%	27.7%
Telefonica	1.4%	2.8%	44.9%	44.1%	43.7%	42.7%
Telecom Italia	2.9%	3.5%	44.0%	42.9%	42.5%	42.3%
TDC	-0.8%	0.0%	34.8%	33.5%	33.0%	32.5%
Telia	1.9%	1.9%	32.8%	32.8%	32.8%	32.8%
Telenor	0.2%	-0.9%	40.1%	43.3%	43.9%	44.6%
<b>Incumbent Average</b>	<b>0.6%</b>	<b>1.1%</b>	<b>35.7%</b>	<b>35.7%</b>	<b>35.4%</b>	<b>35.0%</b>

Domestic Fixed	EBITDA-capex	Capex/ sales			
	CAGR 02-05E	2001E	2002E	2003E	2004E
BT Group	0.3%	10.7%	9.6%	9.3%	9.3%
Deutsche Telekom	2.6%	14.7%	14.9%	14.3%	13.7%
France Telecom	-3.7%	10.8%	10.1%	10.0%	10.0%
KPN	-5.1%	17.1%	12.1%	10.2%	12.1%
Portugal Telecom	-2.2%	10.0%	11.0%	12.0%	11.0%
Swisscom	-0.7%	7.4%	7.5%	8.0%	8.5%
Telefonica	0.2%	18.0%	18.0%	17.5%	17.0%
Telecom Italia	3.3%	16.0%	15.2%	14.7%	14.3%
TDC	2.4%	14.9%	14.4%	13.4%	12.4%
Telia	6.8%	17.5%	17.0%	16.2%	15.3%
Telenor	6.4%	26.2%	20.4%	17.7%	17.8%
<b>Incumbent Average</b>	<b>0.9%</b>	<b>14.8%</b>	<b>13.7%</b>	<b>13.0%</b>	<b>12.9%</b>



# European Telecom Trends (3)

## Dynamics of Mobile operators

Market is questioning ARPU growth ability for Mobile - if ex-growth liked fixed, then low FCF makes mobile look expensive

However we believe:

- Mobile is forecast to sustain strong revenue growth and some slight margin expansion
- Capex/sales is expected to fall on average from very high levels
- As a result, FCF flow margins are expected to expand from zero
- Growth premium for mobile still seems appropriate even if only "option value"

Mobile	Revenue	Opex	EBITDA margin			
	CAGR02-05E	CAGR02-05E	2001E	2002E	2003E	2004E
mmO2	10.9%	7.4%	6.3%	12.7%	16.7%	18.8%
Cosmote	8.8%	10.2%	43.7%	45.4%	44.5%	43.4%
Europolitan	11.1%	11.5%	42.6%	41.6%	40.8%	40.4%
Libertel	9.6%	9.0%	30.7%	32.6%	33.2%	33.0%
Orange SA	8.4%	5.1%	21.6%	24.0%	25.8%	27.4%
Panafon	10.8%	12.4%	44.1%	43.1%	42.3%	41.1%
Sonera	6.6%	4.2%	25.7%	33.9%	36.1%	37.6%
T-Mobile	14.6%	10.6%	20.7%	22.4%	26.2%	28.1%
Telecel	10.7%	9.3%	27.2%	27.6%	29.2%	29.8%
Telefonica Moviles	12.4%	16.8%	39.5%	38.2%	28.6%	27.0%
Telecom Italia Mobile	7.5%	8.4%	45.7%	43.3%	42.3%	41.6%
Vodafone Consolidated	11.9%	10.6%	33.1%	32.1%	32.7%	33.4%
<b>Average</b>	<b>10.3%</b>	<b>9.6%</b>	<b>31.7%</b>	<b>33.1%</b>	<b>33.2%</b>	<b>33.5%</b>

Mobile	EBITDA-capex	Capex/ sales			
	CAGR02-05E	2001E	2002E	2003E	2004E
mmO2	NM	54.1%	30.6%	30.1%	22.5%
Cosmote	3.2%	48.4%	16.2%	21.6%	14.2%
Europolitan	34.1%	19.7%	25.9%	26.0%	17.4%
Libertel	17.1%	27.6%	14.2%	13.9%	12.6%
Orange SA	NM	33.3%	25.9%	23.5%	20.3%
Panafon	26.8%	42.5%	26.6%	19.5%	17.3%
Sonera	18.9%	16.4%	16.4%	15.8%	14.8%
T-Mobile	NM	24.2%	24.7%	21.6%	19.0%
Telecel	55.0%	24.8%	21.2%	18.2%	14.6%
Telefonica Moviles	10.8%	24.0%	19.3%	23.2%	23.9%
Telecom Italia Mobile	23.6%	29.9%	26.3%	20.0%	18.9%
Vodafone Consolidated	36.5%	38.6%	21.1%	19.0%	16.5%
<b>Average</b>	<b>22.7%</b>	<b>32.0%</b>	<b>22.4%</b>	<b>21.0%</b>	<b>17.7%</b>

# European Telecom Trends (4)

## Biggest Risk: Wireless data growth not materializing

- Wireless data is the key to sector growth for incumbents and wireless operators.
- An absence of wireless data services creates pricing and margin risk in the future as 3G capacity is deployed
- Risks in mobile relate to slower than expected evolution of services to drive ARPUs; but ARPU assumptions look reasonable
- Mobile leaders could kick-start wireless data by sacrificing near-term profitability in SRCs
- Weaker players and new MVNOs post a small threat to increased competition

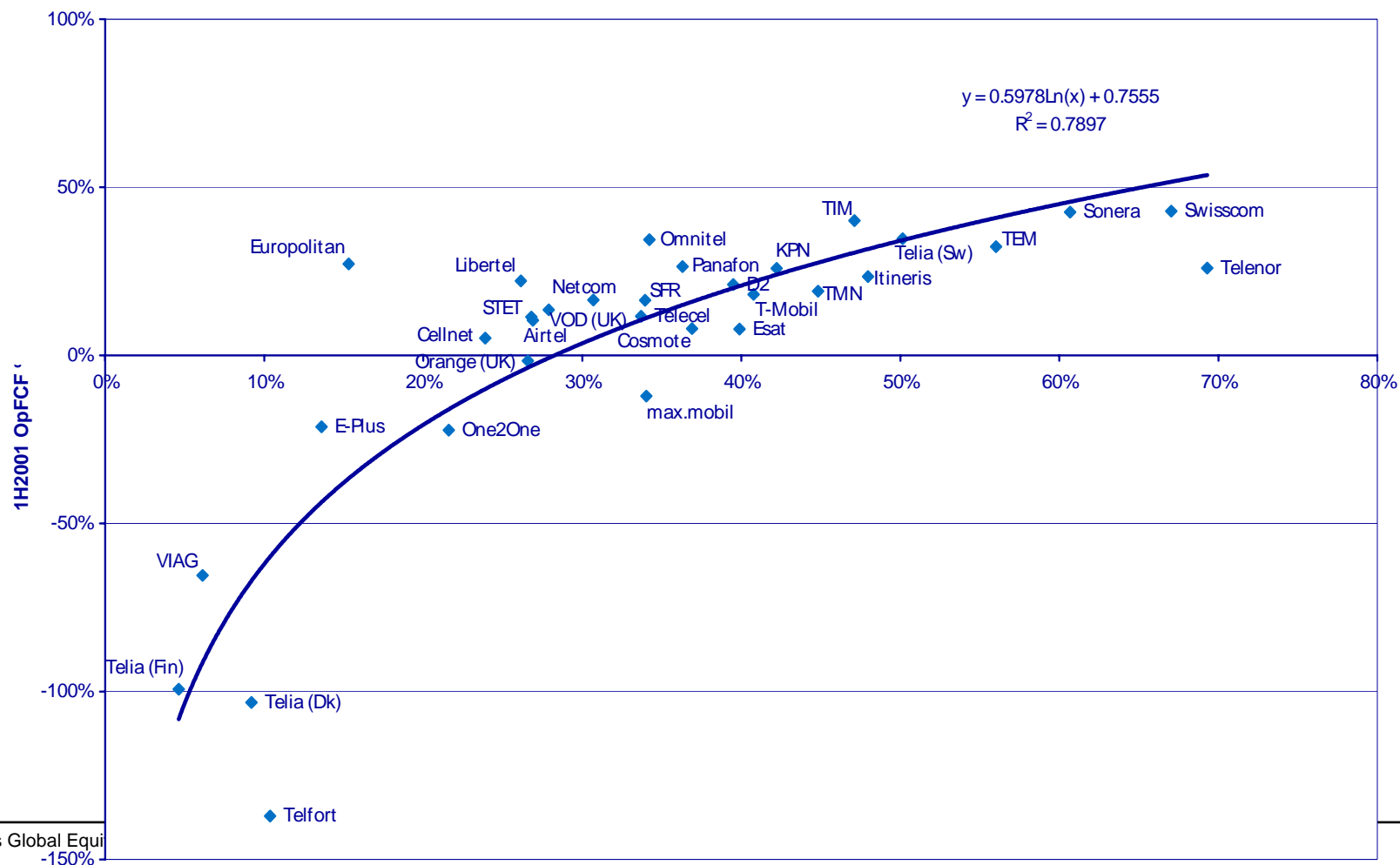
### Vodafone ARPU forecasts look reasonable

Year to March	2000	2001	2002E	2003E	2004E	2005E	2006E	2007E	2008E	2009E	2010E	CAGR% 02-10
<b>Registered ARPU ( / month)</b>												
<b>Germany</b>	<b>47</b>	<b>32</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>30</b>	<b>32</b>	<b>35</b>	<b>38</b>	<b>39</b>	<b>40</b>	<b>6.1%</b>
of which: messaging	10%	13%	13%	13%	11%	10%	9%	8%	7%	6%	6%	
of which: internet data	0%	0%	1%	4%	11%	20%	25%	31%	34%	36%	37%	
<b>UK</b>	<b>50</b>	<b>42</b>	<b>37</b>	<b>36</b>	<b>38</b>	<b>40</b>	<b>42</b>	<b>44</b>	<b>46</b>	<b>47</b>	<b>49</b>	<b>3.4%</b>
of which: messaging	3%	6%	7%	7%	6%	6%	5%	5%	4%	4%	4%	
of which: internet data	0%	1%	2%	5%	10%	17%	23%	26%	29%	31%	32%	
<b>Italy</b>	<b>32</b>	<b>28</b>	<b>26</b>	<b>28</b>	<b>29</b>	<b>32</b>	<b>34</b>	<b>37</b>	<b>39</b>	<b>41</b>	<b>42</b>	<b>6.1%</b>
of which: messaging	5%	6%	7%	7%	6%	6%	5%	5%	4%	4%	4%	(1.5%)
of which: internet data	0%	0%	1%	4%	10%	17%	24%	29%	31%	35%	37%	46.8%
<b>iPhone (Japan)</b>	<b>70</b>	<b>76</b>	<b>64</b>	<b>64</b>	<b>65</b>	<b>68</b>	<b>72</b>	<b>75</b>	<b>78</b>	<b>79</b>	<b>81</b>	<b>3.0%</b>
of which: messaging		4%	4%	4%	4%	3%	3%	3%	3%	3%	3%	
of which: internet data		6%	11%	12%	14%	19%	23%	26%	28%	29%	29%	

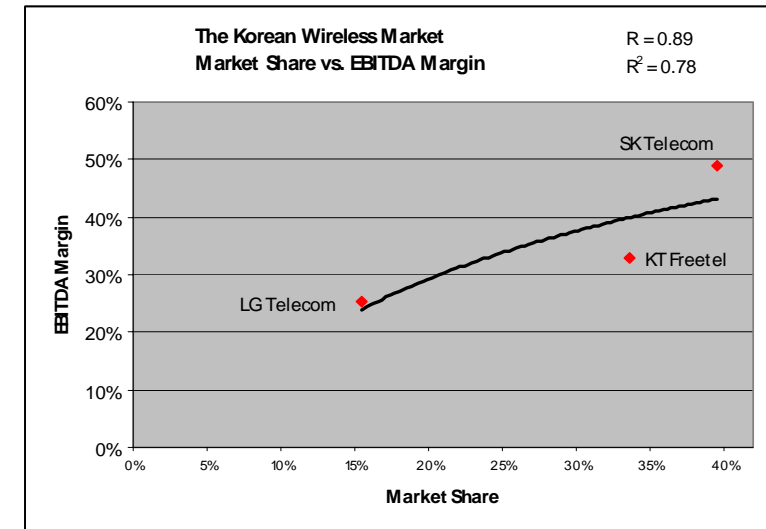
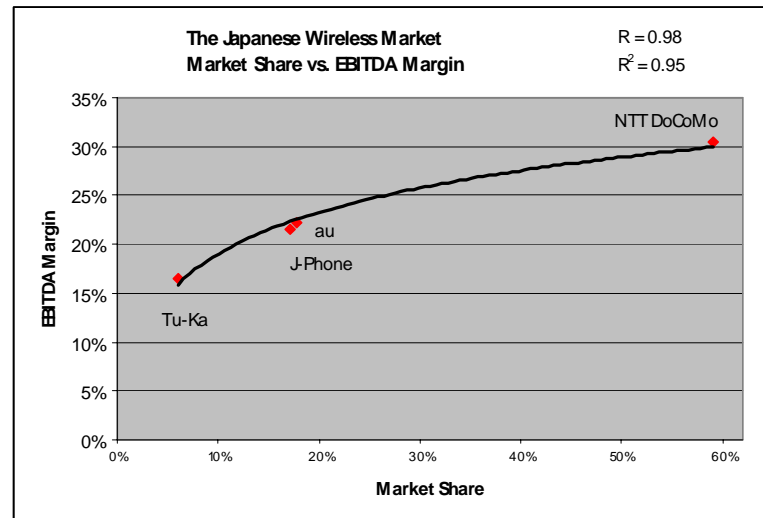
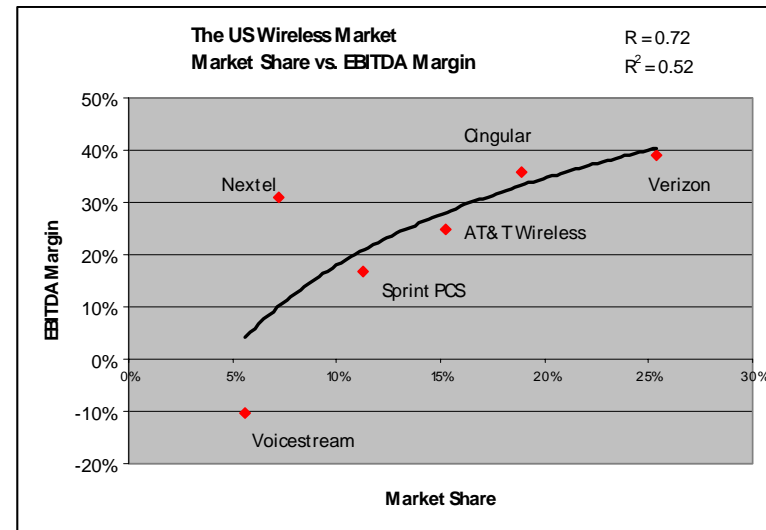
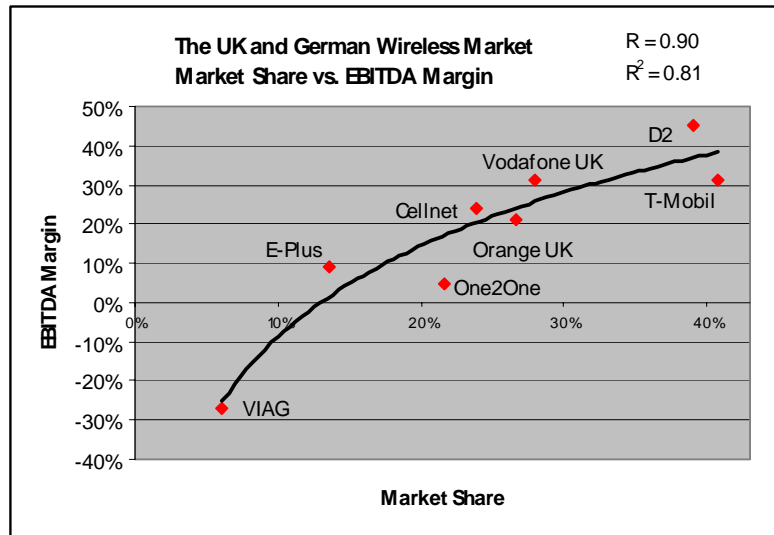
# European Telecom Trends (5)

## Strong relationship between market share and cash flow

- More useful to focus on group cash flow, regardless of fixed or mobile
- Prior to the wireless data story unfolding, stick with the wireless winners such as Vodafone.



# Globally – Strong relationship between market share and margins



## Part 4: Where Korea Stands Out



## Where Korea stands out globally

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- **Demographics** – high density enables relatively economical roll-out of new telecom services
- **Gadget savvy population base** - rapid adopters of latest telecommunication services and products
- **Successful Broadband growth story** - global leader in terms of subscriber take-up and profitability
- **2.5G CDMA (1xRTT and EV DO)** - impressive “3G” data capabilities and revenue potential, should mean no rush to roll out new IMT-2000 network
- **Regulatory environment** focused on ensuring profitability for the operators
  - banning handset subsidies,
  - consolidated the wireless industry, and pushing for consolidation of the fixed line players,
  - cautious stance on number portability, not actively promoting pre-paid
- **High Cash Returns** – thanks to demographics and regulatory environment





# Drivers behind Korea's successful broadband story

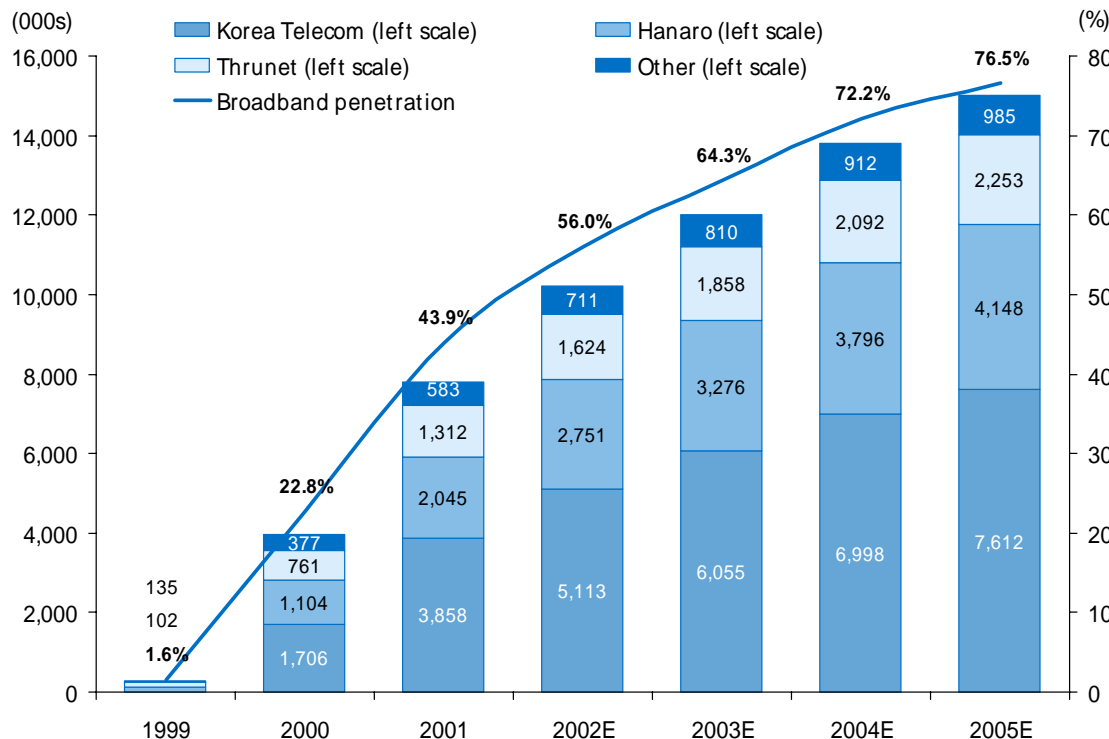
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1. Favorable regulatory environment given the government's strong Internet push since the early 1990s.
2. High urban density – 80% of Korea's 47mn population is urban, thus facilitating a relatively economic network roll out.
3. KT's extensive fiber backbone (110,000 km) and existence of other competitive backbone networks, particularly Powercomm's 50,000-km network
4. Proliferation and popularity of PC/Internet café's, where Koreans were first able to experience broadband speed
5. Various CATV HFC networks being deployed from 1998 onward, particularly Powercomm's HFC network passing 4mn households in the Seoul area
6. New Players Thrunet and Hanaro being able to launch broadband services from 1988 in a relatively economical manner using Powercomm's backbone and HFC networks.
  - Serious competition kick-starting KT into the broadband business
7. KT has unparalleled reach, with 90% of its 21mn local subscriber lines falling within a 4-km radius of its network of 240 nationwide branch offices
  - KT's employee base of 46,000 provides a huge advantage for provisioning and service
8. Broadband service providers marketing and installing the service – users have a one stop shop for broadband installation and after service
9. Genuine broadband access speeds (greater than 1Mbps)
10. Relatively cheap access fee of US\$26-\$30 per month for unlimited usage
11. Homogenous culture and strong education drive

# Broadband subscriber growth beyond 2001?

It took 1.5 years for the Korean market to reach 6 mn subs; we estimate it will take 3 years to reach the next 6 mn

**Broadband subscriber forecast**



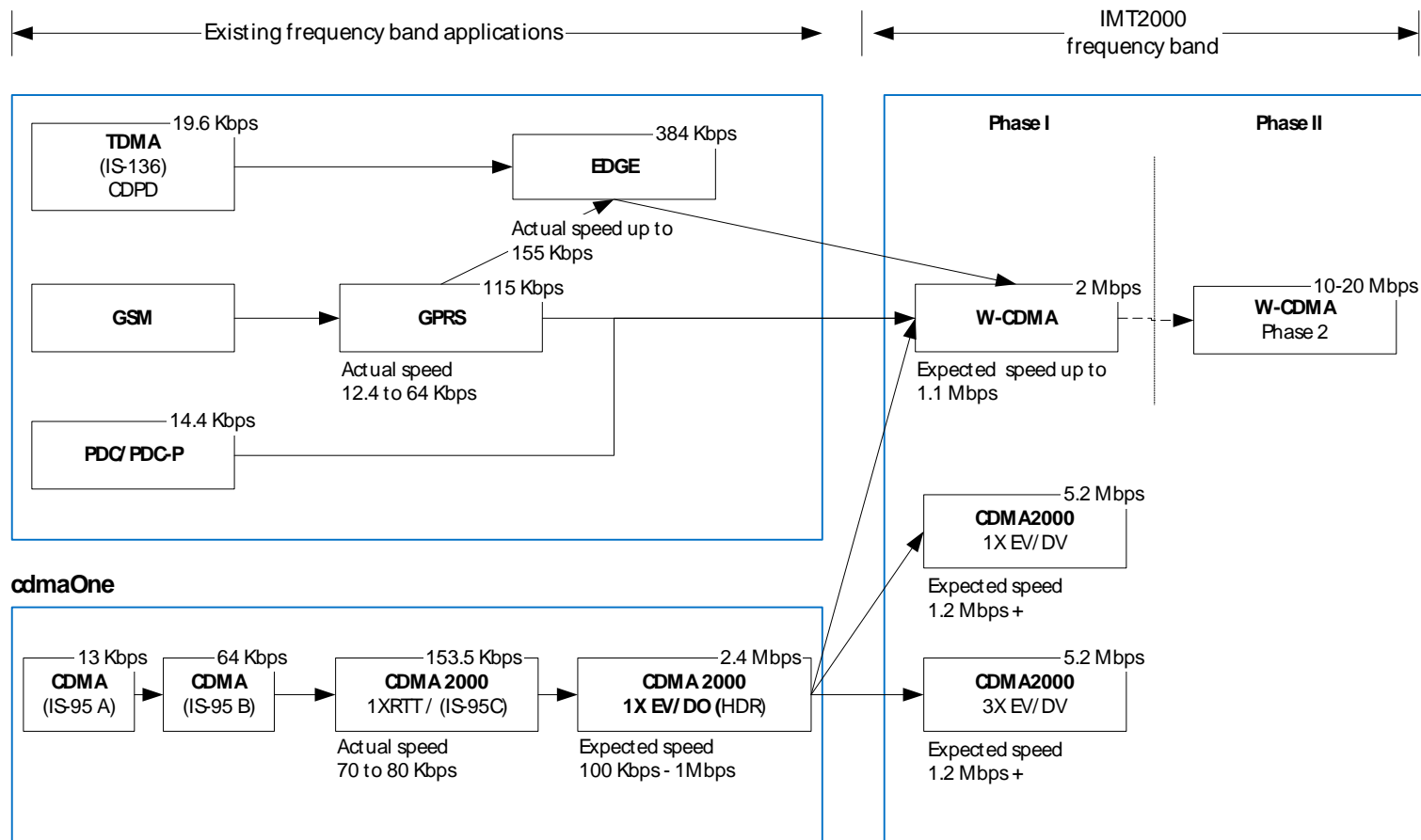
Source: Goldman Sachs Research estimates, Company data.

Why will there be broadband subscriber growth beyond 2001?

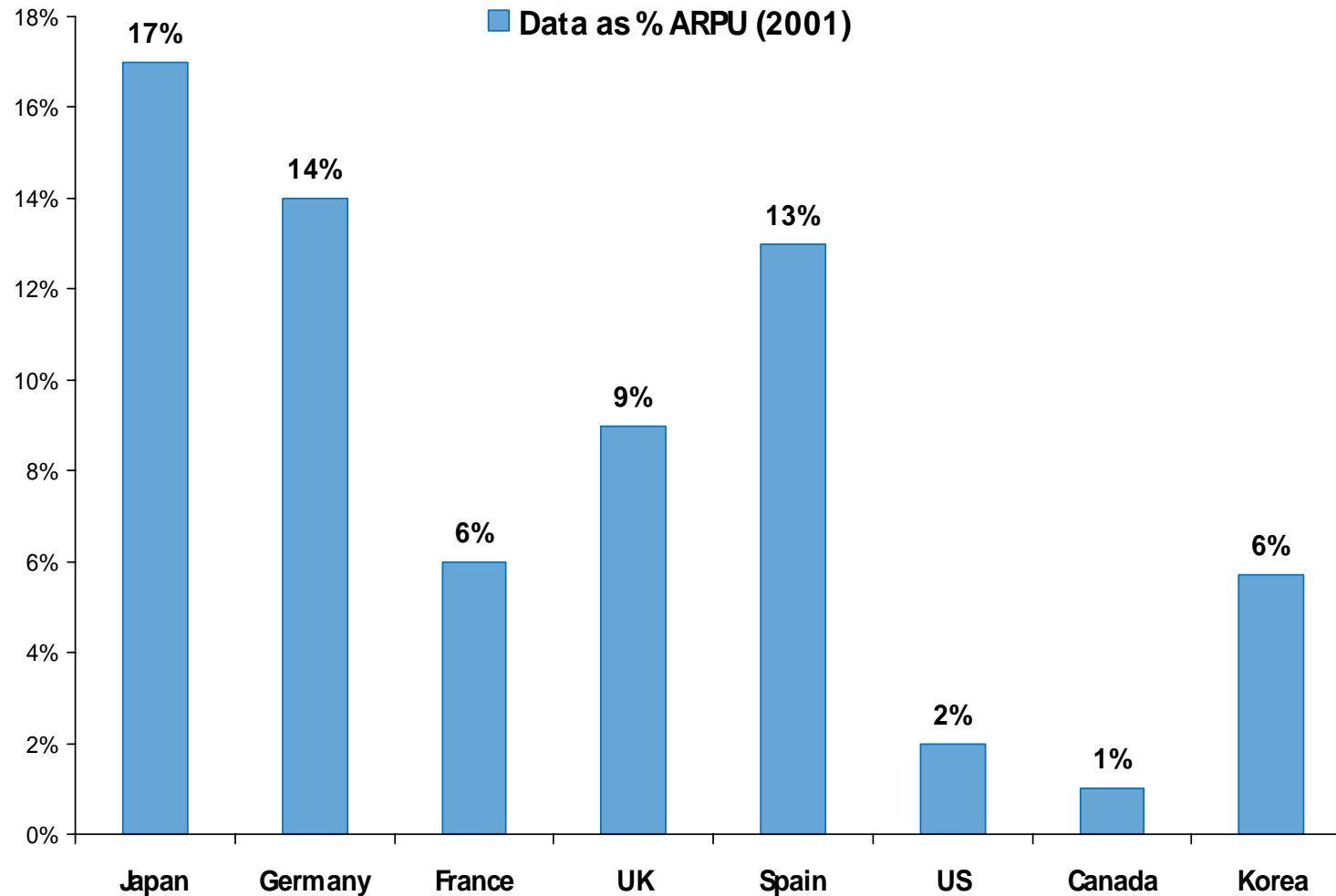
- Affordability
- Genuine broadband access speeds
- Higher home PC penetration rate on a par with the US
- Untapped potential of 3 mn SMEs
- **Long-term drivers—VOD and digital TV**

# Advantages of 2.5G CDMA

- 2.5G CDMA on existing spectrum set to be even more impressive with EV DO in H2
- “3G” type of speeds already being achieved on 2G network
- There should be no rush to roll out new 3G networks

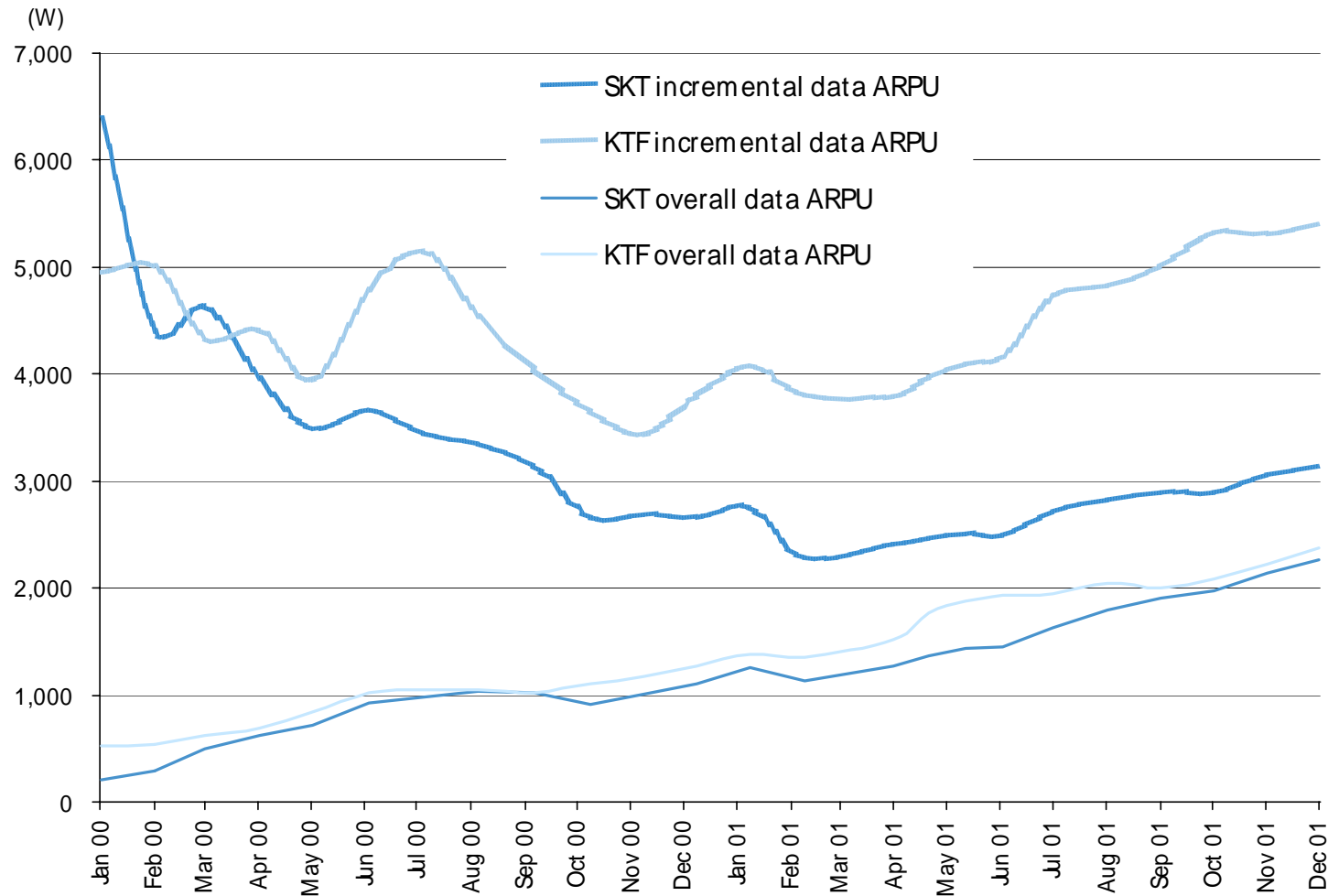


# By how much can data improve overall ARPUs?



Source: Company data, Goldman Sachs Research

# Korean Data ARPUs – small so far, but rising



Source: Company data, Goldman Sachs Research



## Potential data ARPU drivers

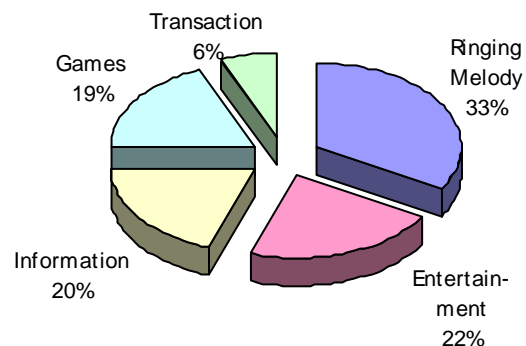
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- Color LCD handsets
- Packet-based charging (started in July)
- Video-On-Demand (VOD) functionality
  - MPEG4 compression in wireless devices
- Handsets with MP3 players embedded
- cdma2000 1x EV DO commercial launch – April-June 2002
- Extensive Mark-Up Language (XML) from mid-2002
  - Enable more Internet content to be more accessible for wireless devices
- Middle Ware – Java? Qualcomm's BREW? Other?

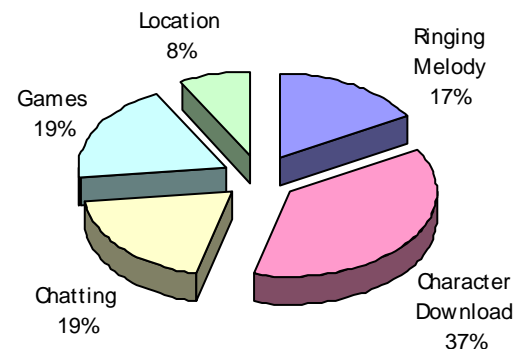
# Mobile Data Drivers (1)

Ringing tones and character downloads popular in Asia, but not Europe

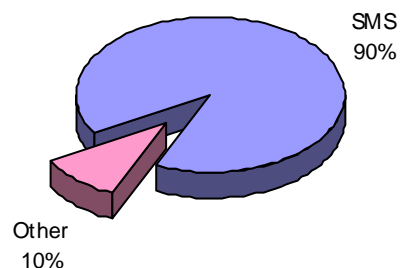
**Japan: Service Hit Rates**



**Korea: Service Hit Rates**

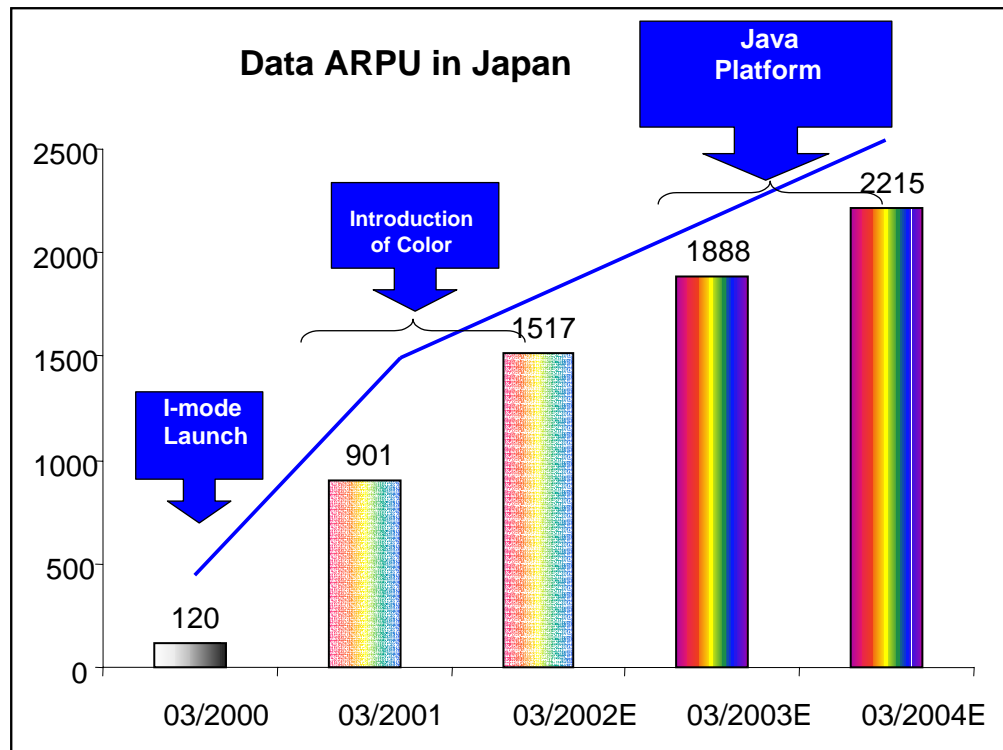


**Europe: Service Hit Rates**



## Mobile Data Drivers (2)

Wider diffusion of color screens could have positive impact?



Source: Company data, Goldman Sachs Research estimates.

### 1) First driver: COLOR to enhance new applications

- There was a 7.5-fold increase in ARPU due to the usage of new color applications
- Increase in usage parallels the switch from a black-and-white TV set to a color TV set

### 2) Second driver: RICHER CONTENT

- Java users use 87% more packets than the i-mode average user
- 26% of i-mode users are Java users





# Mobile data set to double in 2002

## % of ARPU from data

	2000	2001	2002E	2003E	2004E
Regional Wireless Company	?	0	5	12	20
Singapore Telecom	?	2	4	8	13
Telstra Mobile	?	4	7	12	19
TCNZ	?	1	4	8	14
PT Telkom elkomsel	?	5	5	5	5
Hutchison Australia	?	1	4	15	26
LG Telecom	4	5	11	17	21
SmarTone	?	?	6	13	19
SUNDAY	?	3	9	16	22
CMHK	?	2	4	7	9
China Unicom	?	1	3	6	10
KT Freetel	2	7	11	14	18
SK Telecom	2	5	9	10	13
<b>Average</b>	<b>1</b>	<b>3</b>	<b>6</b>	<b>11</b>	<b>16</b>

## Global figures

Vodafone Germany	10	13	14	17	22
Vodafone UK	3	7	9	12	16
Vodafone Italy	5	6	8	11	16
J-Phone	?	10	15	16	18
DoCoMo	10	18	25	33	39
<b>Average</b>	<b>7</b>	<b>11</b>	<b>14</b>	<b>18</b>	<b>22</b>

Source: Company data, Goldman Sachs Research estimates.

## Mobile data ARPU (US\$)

	2000	2001	2002E	2003E	2004E
Regional Wireless Company	—	—	2.3	5.8	9.9
Singapore Telecom	0.1	0.4	0.9	1.7	2.9
Telstra Mobile	0.8	1.5	2.7	4.8	7.6
TCNZ	0.1	0.4	1.1	2.1	3.6
PT Telkom elkomsel	—	0.9	0.8	0.8	0.8
Hutchison Australia	—	0.4	1.6	6.8	12.7
LG Telecom	0.4	1.4	2.3	2.9	3.8
SmarTone	—	—	1.6	3.7	5.4
SUNDAY	0.1	0.8	2.5	4.8	7.5
CMHK	—	0.4	0.5	0.9	1.3
China Unicom	—	0.1	0.3	0.5	0.9
KT Freetel	0.4	1.4	2.3	2.9	3.8
SK Telecom	0.6	1.3	2.3	2.7	3.3
<b>Average</b>	<b>0.2</b>	<b>0.7</b>	<b>1.6</b>	<b>3.1</b>	<b>4.9</b>

## Global figures

Vodafone Germany	4.2	3.7	3.1	3.9	5.2
Vodafone UK	1.3	2.6	2.9	3.8	5.4
Vodafone Italy	1.4	1.5	1.8	2.7	4.1
J-Phone	—	6.7	8.5	9.0	10.3
DoCoMo	6.6	11.4	16.3	21.7	25.6
<b>Average</b>	<b>2.7</b>	<b>5.2</b>	<b>6.5</b>	<b>8.2</b>	<b>10.1</b>

Source: Company data, Goldman Sachs Research estimates.

- We believe the potential for mobile data is fully reflected in current share prices.
- Korea and Japan are still the key markets for product rollout, in our view.
- If share prices gather momentum, we see the Korean companies as the best plays.
- Our forecasts are on average still beneath management guidance in 2005 and below the Japanese companies in absolute US\$ per sub.



## Key limitations to mobile data growth

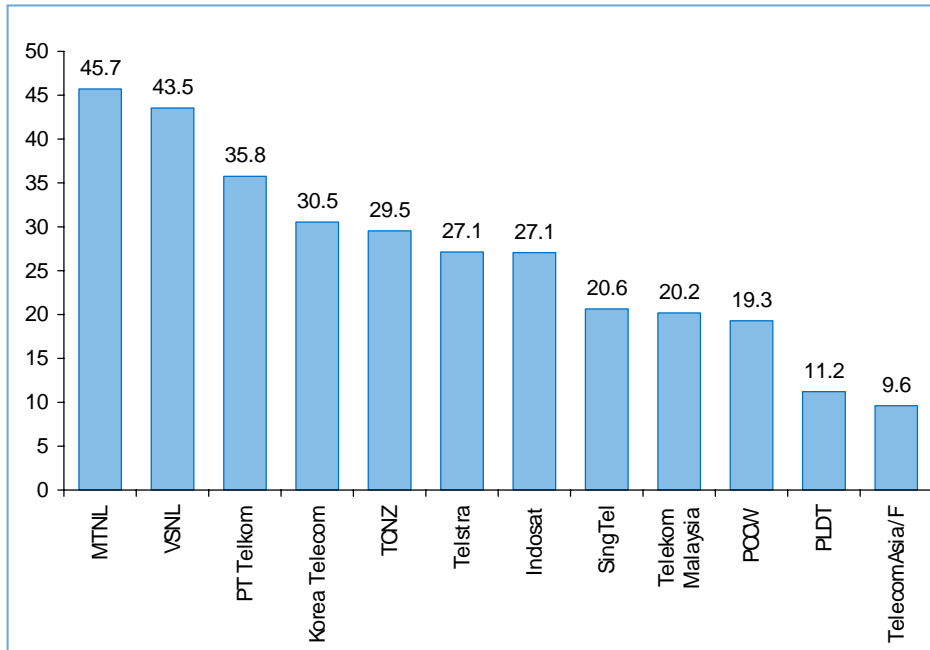
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- Korean users are more accustomed to broadband
- Battery problems
- Core chipset problems—currently unstable for multi-media
- Network problems
- High handset retail prices
- Packet charging still too expensive to motivate usage
- Risk of data services being used as a promotional/marketing tool

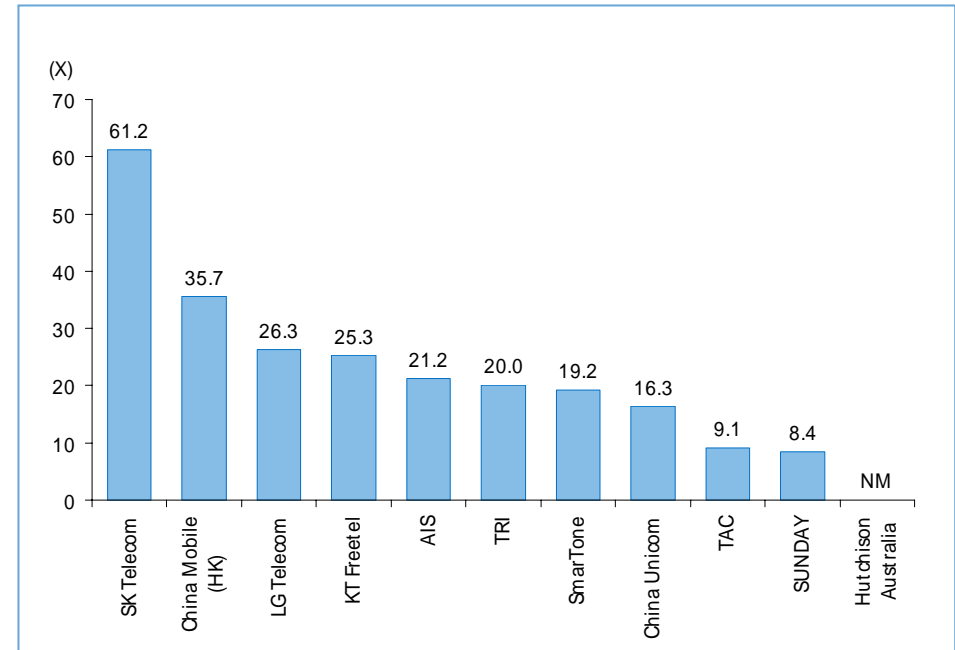
# Korean telcos have high cash returns

- Korean telcos have an adequate asset base in relation to returns
- Indicates how efficiently a telco's asset base is deployed

Asian fixed line 2002E recurring  
CE/Net fixed assets (X)



Asian wireless 2002E recurring  
CE/Net fixed assets (X)



Source: Goldman Sachs Research estimates.



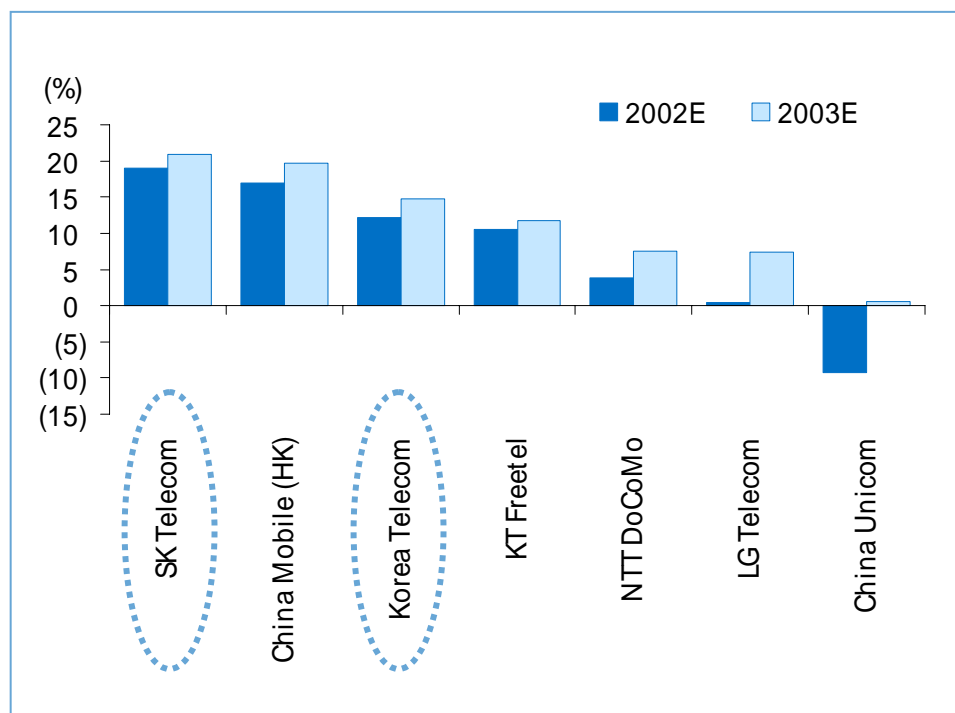
# Lower capex levels could lead to higher valuations: Capex to sales ratio

	1998	1999	2000	2001E	2002E	2003E
<b>Wireless: capex (W mn)</b>						
LG Telecom	639,304	385,416	249,850	384,687	535,702	444,382
KT Freetel	1,182,316	1,094,218	1,092,206	1,173,757	787,311	824,820
SK Telecom	859,600	1,123,800	2,241,063	1,489,720	1,489,915	1,397,812
<b>Fixed-line: capex (W mn)</b>						
KT (consolidated)	3,715,060	3,081,193	4,583,002	4,706,121	4,088,174	3,969,787
Hanaro	328,329	545,600	1,774,900	769,800	459,600	331,110
<b>Wireless: capex/ sales (X)</b>						
<b>LG Telecom</b>	<b>122.6</b>	<b>37.4</b>	<b>17.5</b>	<b>21.5</b>	<b>28.5</b>	<b>23.0</b>
<b>KT Freetel</b>	<b>110.1</b>	<b>46.0</b>	<b>33.4</b>	<b>29.4</b>	<b>18.8</b>	<b>18.5</b>
<b>SK Telecom</b>	<b>24.4</b>	<b>26.2</b>	<b>38.9</b>	<b>18.2</b>	<b>17.7</b>	<b>15.5</b>
Asia average	40.3	42.1	35.4	38.6	26.8	24.8
Global average	34.9	35.9	33.3	38.8	36.8	27.9
<b>Fixed-line: capex/ sales (X)</b>						
<b>KT</b>	<b>36.5</b>	<b>26.1</b>	<b>33.9</b>	<b>29.5</b>	<b>24.0</b>	<b>22.6</b>
<b>Hanaro</b>	<b>331,431.7</b>	<b>2,359.9</b>	<b>527.9</b>	<b>105.0</b>	<b>42.0</b>	<b>24.8</b>
Asia average	26.6	21.4	25.9	30.9	22.9	18.7
Global average	24.3	21.3	23.9	25.5	20.3	18.3

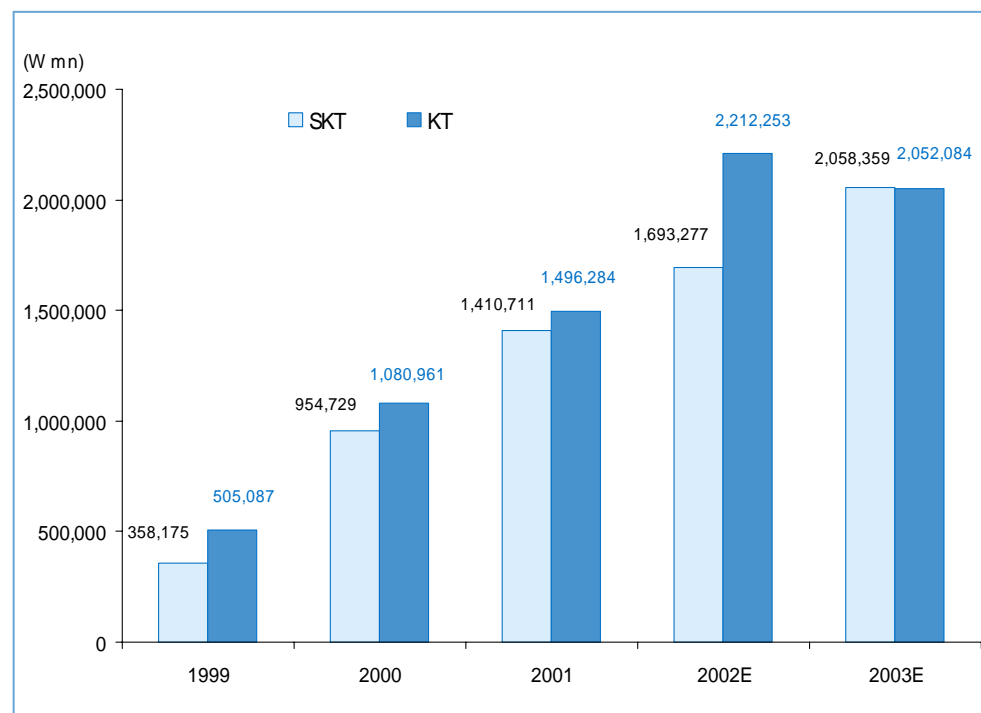
Source: Company data, Goldman Sachs Research estimates.

# Free cash flow margins and forecasts

FCF margins, 2002E and 2003E



KT and SKT NOPAT, 1999-2003



Source: Company data, Goldman Sachs Research estimates.

## Part 5: Where Korea Lacks



## Where Korea Lacks globally

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- **Transparency**, corporate governance (is management incentivized to improve shareholder value?)
- **Political influence** (reluctance to report high profits in voting years, which seem to be at least every second year)
- **Aggressive accounting policies** understating true earnings
- **Ability to spend cash flow wisely** - little confidence yet
- **Low Dividends**
- **3G Consortiums** - licenses awarded to consortiums instead of the existing mobile players
- **Confusion over 3G launch date and technology**
- **49% foreign investment limit** on telecom companies
- **Labor unions** – strong influence, opposed to restructuring



# Use of free cash flow

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## Wise use of Cash flow

- Necessary capex which enhances overall returns (ROE, ROCE etc)
- Share buybacks & cancellations
- Increase shareholder dividends
- Repay debt

## What could go wrong?

- Overspending on 1xRTT
- Premature 3G launch
- Return of handset subsidies
- Investment in non-core assets?
- Overseas Investments
- Excessive tariff reductions
- Labor costs rising above expectations





# FCF improving, but shareholder value is not

## Free cash flow margin (%)

	2000	2001E	2002E	2003E	2004E
Indosat	36.7	(80.4)	(14.6)	8.5	14.1
Korea Telecom	(14.2)	7.3	12.2	14.7	15.7
MTNL	6.5	8.3	12.7	13.6	12.9
PCCW	(23.2)	11.6	13.5	17.4	32.0
PLDT	(51.5)	6.9	11.1	16.4	17.7
PT Telkom	25.3	16.8	28.5	32.1	31.8
Singapore Telecom	32.3	27.9	(29.3)	6.2	12.6
TCNZ	17.7	(3.9)	5.6	11.6	10.6
TelecomAsia	40.2	41.6	36.1	34.8	31.7
Telekom Malaysia	8.8	20.3	17.9	20.7	18.7
Telstra	10.5	13.9	14.4	14.8	16.6
VSNL	4.9	39.1	10.1	3.6	5.1
<b>Fixed line average</b>	<b>7.8</b>	<b>9.1</b>	<b>9.8</b>	<b>16.2</b>	<b>18.3</b>
AIS	(20.5)	(20.0)	(12.4)	5.0	15.9
QMHK	3.6	9.4	16.9	19.6	20.8
China Unicom	(71.7)	(66.8)	(9.3)	0.6	8.5
HTA	(23.3)	(97.3)	(231.4)	(103.1)	(19.7)
LG Telecom	9.3	0.2	0.5	7.4	11.0
KT Freetel	(10.6)	(9.5)	11.0	13.6	15.6
SK Telecom	3.4	14.6	18.3	21.2	23.5
SmarTone	(20.0)	(0.3)	(13.4)	(41.1)	0.3
Sunday	(38.2)	(13.1)	(27.6)	(21.1)	(9.1)
TRI	(24.5)	(1.4)	21.1	14.3	15.6
TAC	4.6	(54.3)	(11.9)	(0.9)	5.5
<b>Mobile average (ex HTA)</b>	<b>(16.5)</b>	<b>(14.1)</b>	<b>(0.7)</b>	<b>1.9</b>	<b>10.8</b>
<b>Total average (ex HTA)</b>	<b>(3.2)</b>	<b>(1.4)</b>	<b>5.1</b>	<b>9.7</b>	<b>14.9</b>

- FCF is improving, but we are not forecasting dividend payouts to increase, which is a key driver of value.

Source: Company data, Goldman Sachs Research estimates.



## 2.5G Vs 3G Investment

---

- 2.5G Network build-out: Hardware overlay or software upgrade approach?
- Premature 3G service launch will limit 1x RTT returns; returns on 1x RTT investment depend on when the Korean operators will launch 3G services; SKT and KTF have W-CDMA licenses for 3G, not cdma2000, which means a new network for 3G with little compatibility with the 1x RTT
- We question the need to launch even a limited W-CDMA service launch in Korea within five years given:
  - Data speeds on W-CDMA in Japan are similar to 1x RTT (50-100Kbps)
  - Expected actual data speed for EV DO is around 500Kbps
  - We believe the Korean operators have sufficient spectrum on existing 2.5G network
  - Korean government requires W-CDMA handsets to be backward-compatible with the 2.5G CDMA2000 network



# Normal Valuation Methodology

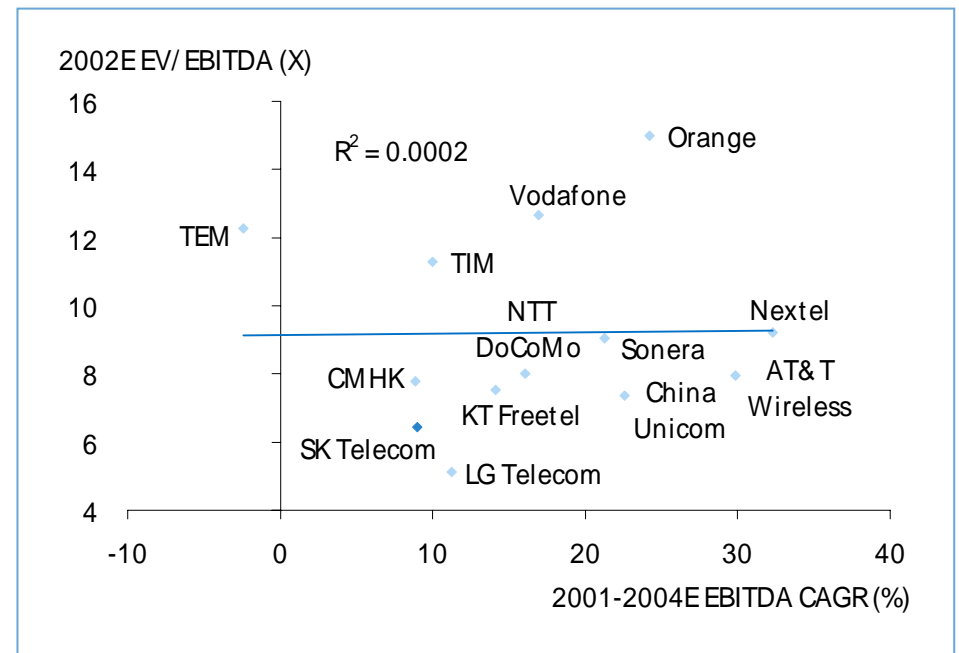
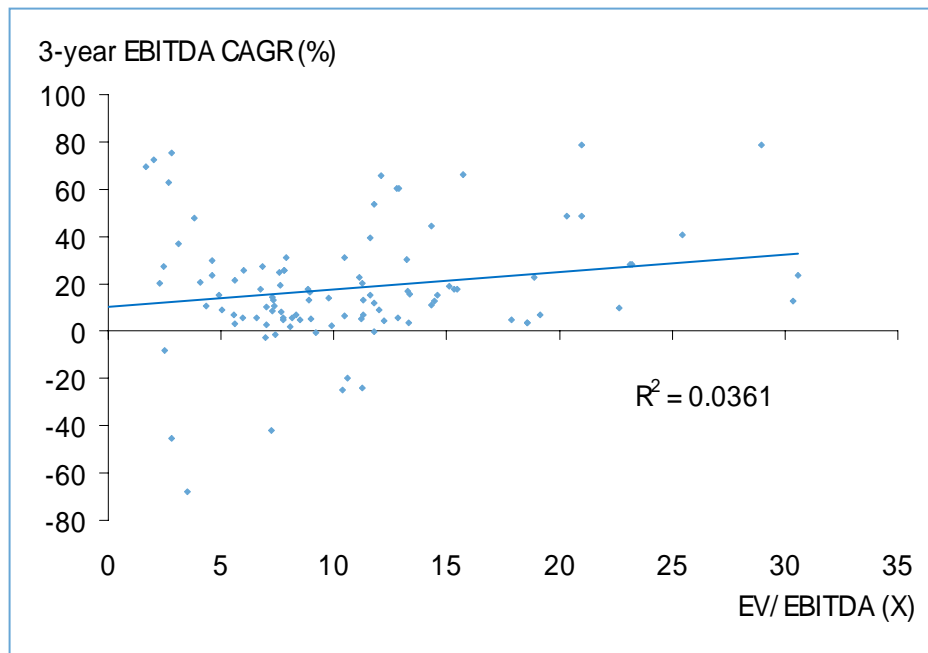




# EV/EBITDA has its weakness

## Correlation between EV/EBITDA and growth is low

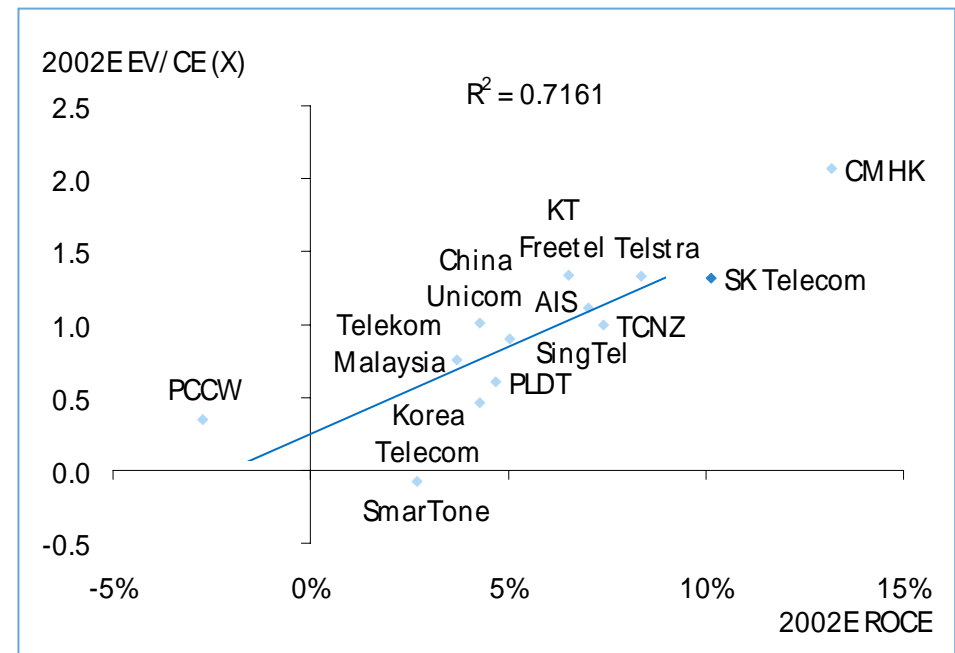
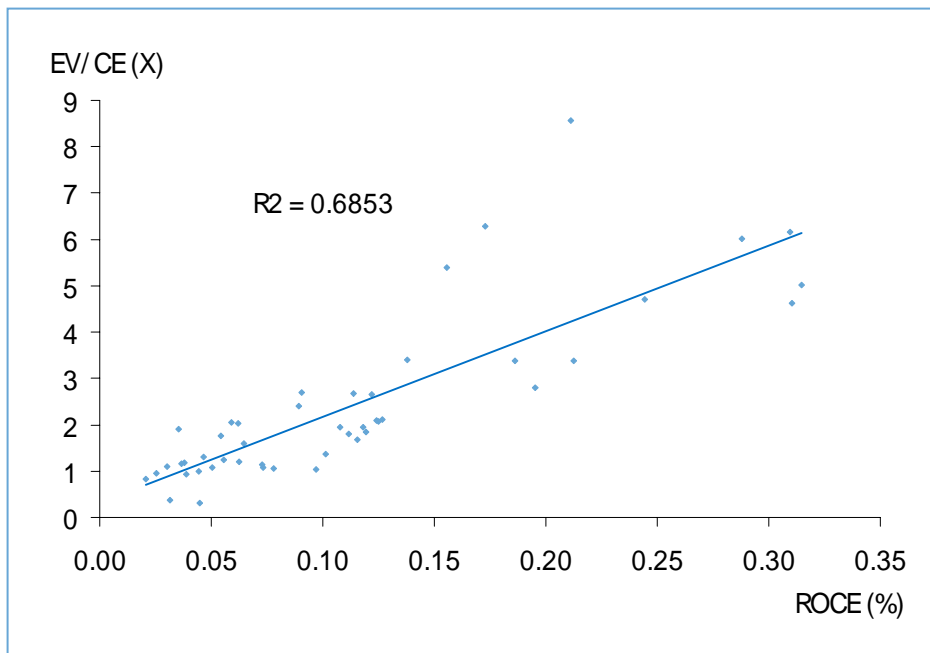
- Regression studies on statistical significance of EV/EBITDA and P/E multiples show very weak correlation with growth



Source: Goldman Sachs Research estimates.

# ROCE to EV/CE provides new perspective on valuations

- More meaningful relationship found between Return On Capital Employed (ROCE) and EV/CE—our findings suggest valuations are more driven by the relationship of cash employed and cash earned



Source: Goldman Sachs Research estimates.



# EV/CE & ROCE Derivation

$$\text{EV/CE} = \frac{\text{Enterprise value}}{\text{Capital employed}}$$

$$\text{ROCE (return on capital employed)} = \frac{\text{NOPAT}}{\text{CE}}$$

## Enterprise value

Average market cap for the period  
+ Net debt/(cash)

= EV

## Capital employed calculations

Total assets  
- Current liabilities  
+ Accumulated depreciation  
+ Asset writedowns  
+ Amortization of goodwill

= CE

## NOPAT (Net Operating Profit After Tax)

EBIT  
- EBIT x tax rate  
+ Goodwill amortization and writedowns

= NOPAT



# Adjusting P/E to allow for proper benchmarking

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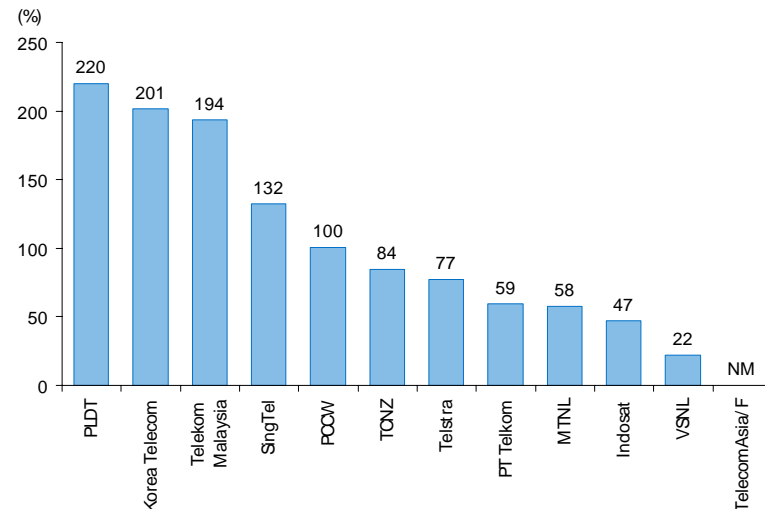
- We believe P/E is a better valuation tool than other multiples
  - However reported P/E can be dangerous due to divergent depreciation and amortization policies
- Reported P/E can be misleading and lead to surprises as reported and actual EPS will converge over time; thus, DPS can be impacted
- Normalized P/E allows for proper benchmarking
- P/E on recurring cash earnings (RCE) captures cash power of the companies, and return on RCE the efficient use of assets
- KT trades like a developing telco, is conservative, and delivers high returns
- SKT and LGT are also attractive among the wireless stocks



# Depreciation is an area of high volatility

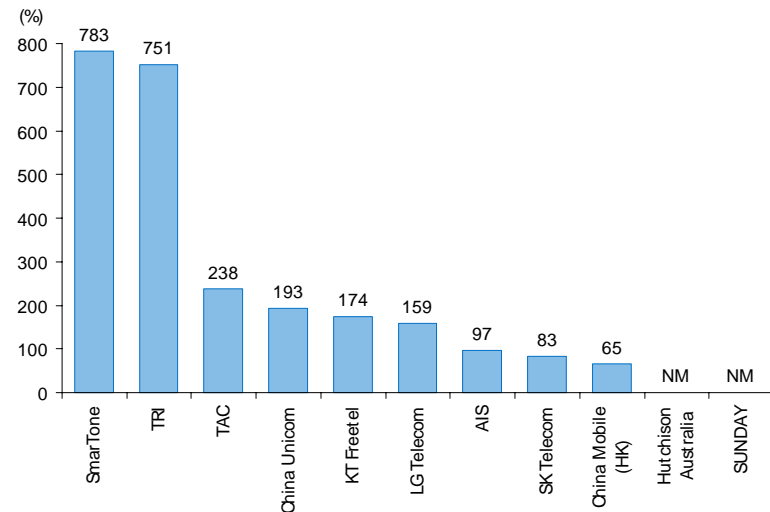
Depreciation is a key item driving earnings for capital-intensive telcos

Reported depreciation charge/reported earnings, CY2002



Depreciation for wireless is much larger than for fixed line companies

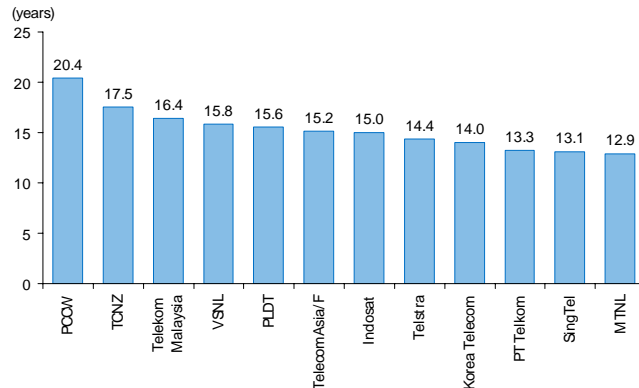
Reported depreciation charge/reported earnings, CY2002



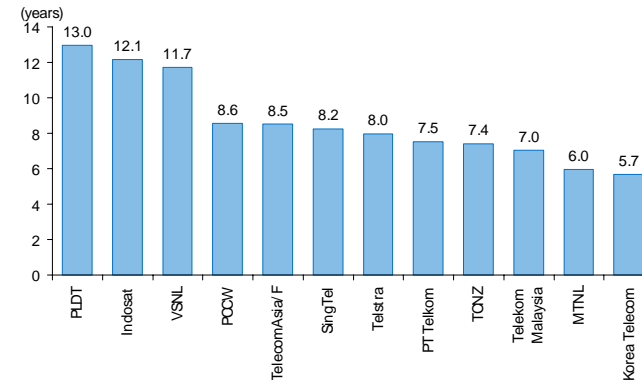
Source: Company data, Goldman Sachs Research estimates.

# Korean companies as a group generally adopt conservative depreciation policies

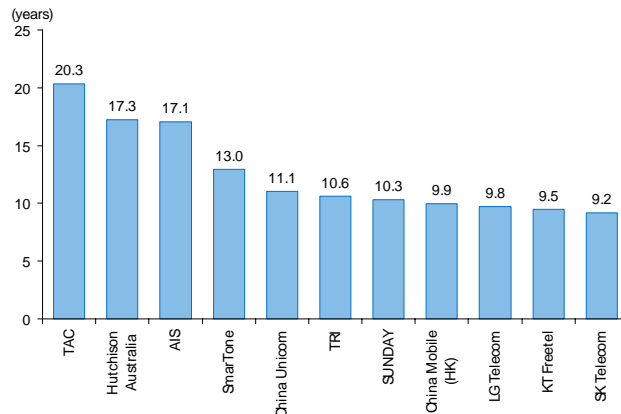
**Fixed Line - Gross fixed assets/ depreciation charge**



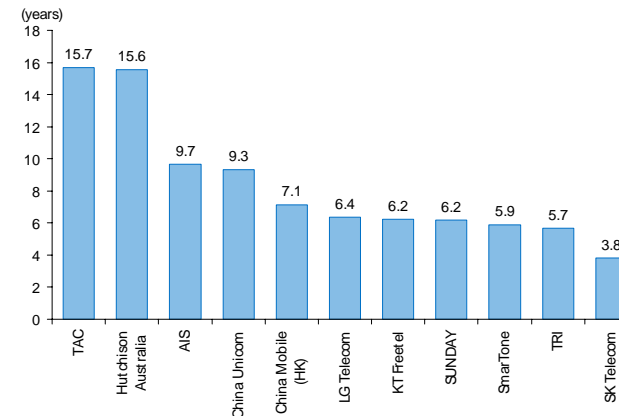
**Fixed Line - Net fixed assets/ depreciation charge**



**Mobile - Gross fixed assets/ depreciation charge**



**Mobile - Net fixed assets/ depreciation charge**



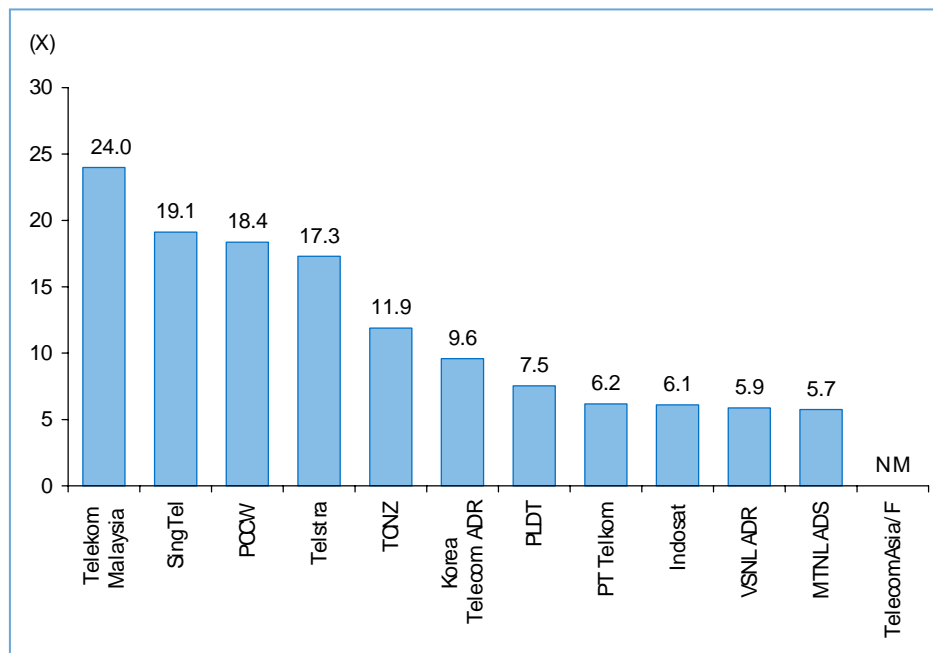
Source: Company data, Goldman Sachs Research estimates.

# Normalized P/E multiples: Asia fixed line

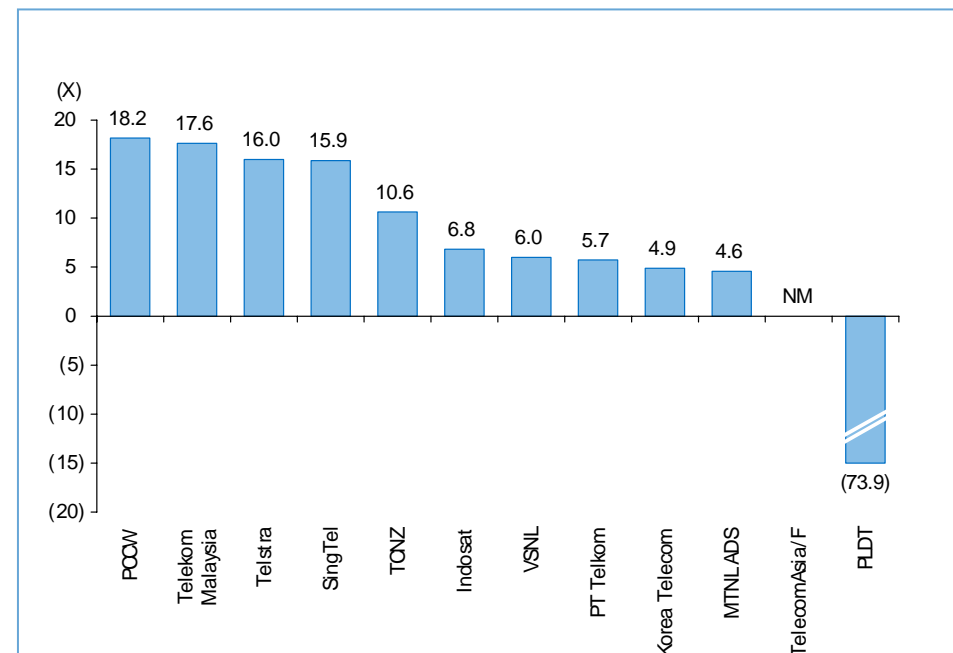
## KT appears attractive at 4.9X adjusted 2002E P/E

- Normalizing earnings for depreciation and amortization
- KT's reported earnings are heavily depressed by a conservative depreciation policy and goodwill amortization charges

2002E P/E on reported earnings



2002E P/E on normalized earnings based on net fixed assets



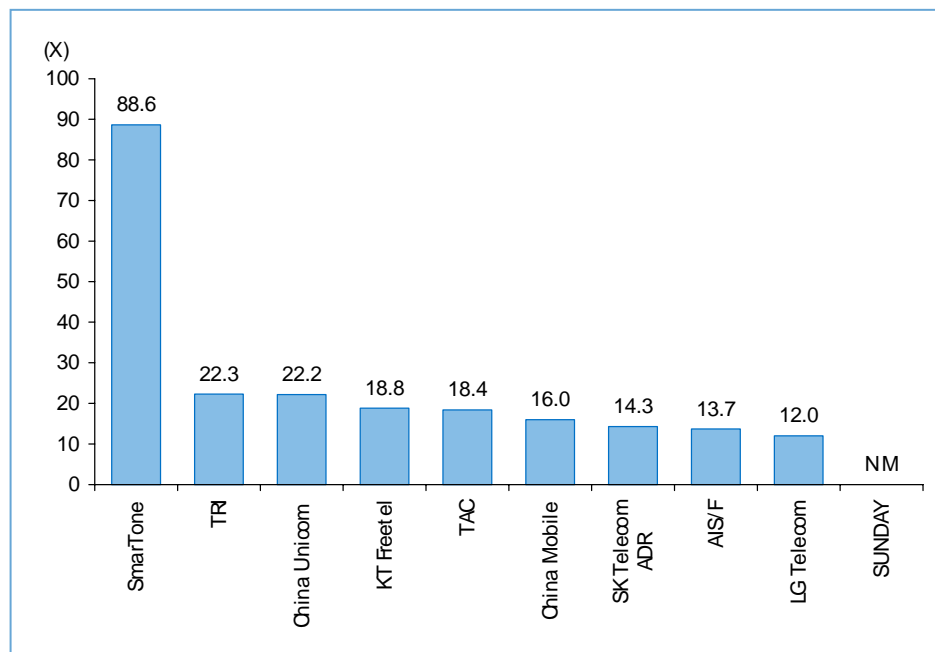
Source: Goldman Sachs Research estimates.



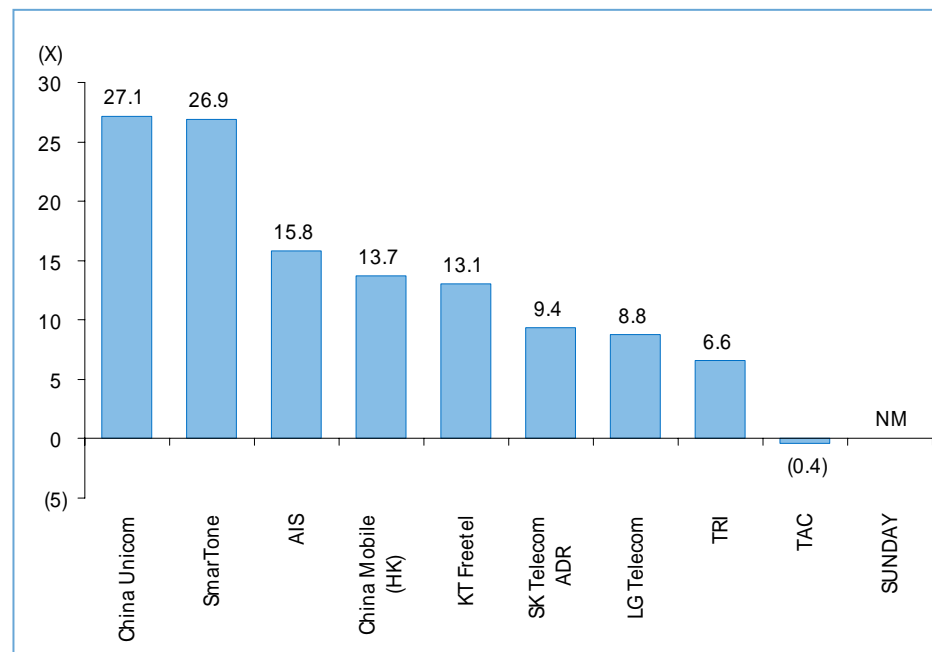
## Normalized P/E multiples: Asia wireless SKT and LGT look attractive

- SKT's earnings likewise depressed by short depreciation policy and goodwill amortization (on Shinsegi acquisition)
- LGT already trades at a significant discount

2002E P/E on reported earnings



2002E P/E on normalized earnings based on net fixed assets



Source: Goldman Sachs Research estimates.



# Conclusion

## Why Korean Telecom Co's stand out globally

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1. **Regulation** has resulted in consolidation and increased profitability for all the operators whilst at the same time to the benefit of consumers
2. **Korea is a leader** in broadband proliferation, both fixed and wireless
3. **The companies trade at significant discounts** to their global peer group. Therefore there is still value for investors to draw upon in the market

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