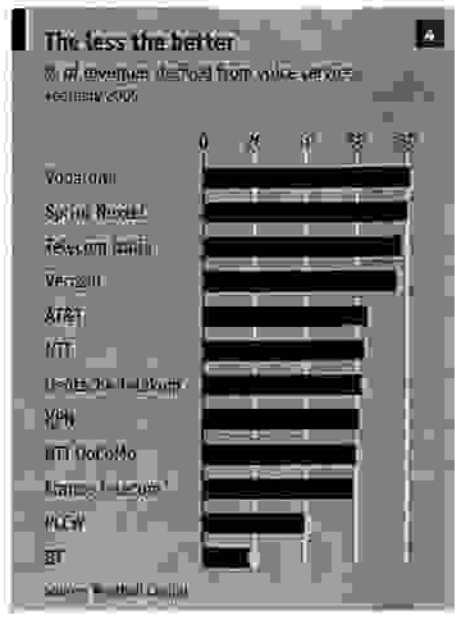
an analyst at Westhall Capital, and mobile prices are typically three to ten times higher than fixed-line prices. The majority of mobile operators depend on voice for over 80% of their revenues, and voice prices "are likely to fall close to zero in an internet-centric world," he says. He notes that each new telecoms technology spreads more quickly than the last: fixed-line telephones took 50 years to reach 50% of the population, mobile phones took 20 years, the internet ten and broadband five in some parts of the world. Mobile VOIP could be widespread within two or three years, he thinks.

The emergence of a Skype-like piece of software that could be downloaded onto a 3G phone and used to make VOIP calls could be "lethal" to mobile operators, says John Barrett of Parks Associates, a consultancy. Operators offer data communications far more cheaply than voice, often in the form of flat-rate data packages, so subscribers could avoid call charges and roaming charges by using a VOIP program to disguise their mobile calls as data traffic. Operators could block access or degrade the quality of their data services, but that would antagonise subscribers. Cutting voice prices to make traditional mobile calling more attractive would decimate their revenues, and raising data prices to discourage VOIP calling would erect more barriers to the take-up of their new data services upon which the operators are relying for future growth. "They are between a rock and a hard place," says Mr Barrett.

For the time being, he says, getting VOIP to work on a mobile handset would be too fiddly for most people. But as handsets start to resemble pocket computers, with downloadable games and other software,



the threat of mobile VOIP looms ever larger. Ironically, as mobile operators race to upgrade their 3G networks to offer wider coverage and higher transmission speeds, they also increase their vulnerability to VOIP.

So what can mobile operators do? Some of them are already experimenting with mobile VOIP, says Mr Zennström, as a means of differentiating themselves from their competitors. In particular, E-Plus, a German mobile operator, has a partnership with Skype that allows subscribers to its unlimited 3G data plan to use Skype on the move for a fee of €40 ($51) a month—though they still have to use a laptop computer with a wireless-data card rather than a mobile phone. E-Plus is doing this mainly to sell wireless-data cards and will value-able business customers from rival operators. But its model may point the way for other mobile operators.

Just as fixed-line operators have switched to flat-rate billing plans, mobile operators could offer unlimited national voice calls plus unlimited data for a fixed fee, so there would be less incentive to use VOIP instead. Some operators are already moving that way, and unlimited-use data plans are also growing in popularity. Vodafone's Mr Sarin says he is watching the technology closely. But it need not be bad news for his company, he insists, because to make mobile VOIP calls subscribers will still need to pay for access to a high-speed wireless network, which is exactly what mobile operators provide.

Indeed, operators might embrace mobile VOIP technology themselves, as the cheapest way to offer unlimited calls. A recent report by Analysys, a consultancy, predicts that mobile VOIP will account for 25% of mobile calls in Europe and America by 2015—but that this will actually be a good thing for operators. They will offer mobile VOIP as a premium service with additional features such as instant messaging and "presence" information. At the same time mobile VOIP will reduce costs for operators, just as it has done for fixed-line operators, the report predicts.

Voice-data convergence, then, seems likely to mean that in future customers will pay a monthly access fee to use their phones but not pay for individual calls. Geographical and time-based charging will pass into history as VOIP erases the distinction between voice and data. This will happen on both fixed and mobile phones—though convergence is starting to erase that distinction, too. ■

Home and away

After many false starts, fixed and mobile phones are getting ready to merge

PITY the poor old fixed-line telephone. Not only is it now being hollowed out by VOIP technology; it has also been upstaged in recent years by the mobile phone, a far more glamorous, capable and personal device. The fixed-line phone looks old-fashioned by comparison. Where is the colour screen, the camera, the funky ringtone? What, no text messaging? No wonder mobiles now outnumber fixed phones, and that voice traffic is migrating from fixed to mobile networks. Some people are even "cutting the cord"—ditching fixed lines altogether in favour of mobile phones. The proportion of "mobile-only" households is approaching 10% in America, around 15% in western Europe and over 35% in Finland.

But fixed-line phones do have some things going for them. Calls are cheaper and clearer, and you do not have to hunt around for a signal. So technologists have long dreamed of combining fixed and mobile phones to provide the best of both worlds: the freedom and flexibility of a mobile phone plus the reliability and low cost of fixed lines. This is called "fixed-mobile convergence" (FMC), and there have been many failed attempts at it over the years. But this time it looks as though it might really happen, thanks to improvements in technology and the industry's current mania for convergence. "FMC may ▸▸