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## **THE WEIGHTLESS ECONOMY: NINTENDO AND HEAVY METAL**

**By Danny Tyson Quah**

*In his first regular column on dematerialisation, Danny Tyson Quah asks what it means - and what it means for economic performance; and sets the stage by describing two ideas.*

Idle talk about the promise of computers and information technology infuriates economists. They find that those overly taken with the new technology often display a breathless naivete inconsistent with what economists consider to be proper hard-headed analysis. And, anyhow, everything worthwhile saying about any kind of new technology is already in Marshall or Schumpeter, somewhere.

But does information technology (IT) really deserve this reaction? I take information technology (IT) to be but one instance, although an important one, of the increasing weightlessness or dematerialisation of modern economies. By dematerialisation, I mean that situation where an increasingly greater fraction of GDP comes to reside in economic goods with little or no physical manifestation. Examples of such commodities include computer software, telecommunications, mathematical and biological algorithms, semiconductors, video entertainment, and database content. These differ, obviously, from either agriculture or traditional manufacturing industry. And neither are they straightforwardly regarded as services: they certainly differ from gardening, hairdressing, or bed-making.

The putative importance of dematerialisation and IT differs profoundly from the importance of "ideas" for economic growth. It was probably an idea that allowed our ancestors to triumph over the Neanderthals 50,000 years ago; it was unquestionably an idea that in each instance brought forth the printing press, the spinning jenny, the steam engine, and the railway. All of these were important landmarks in economic growth. None of them, however, had anything to do with dematerialisation or with IT.

What does this structural change towards dematerialisation and IT imply? Is everything really already in Schumpeter? Or is looking for answers there a little like trawling the Quran for insight on how to deal with test-tube fetuses past their born-by dates?

### **Two ideas: Tension and Promise**

Some observers consider an IT-based, dematerialised economy old news. That weightless economy arrived yesterday, and is today more than evident:

"More Americans make computers than cars; more make semiconductors than construction machinery; more work in data processing than oil refining. Since 1990, US firms have been spending more on computers and communications gear than on all other capital equipment combined. Software is the country's fastest-growing industry. World trade in information-related goods and services is growing five times faster than in natural resources."

*(John Heileman, The New Economy, Stupid, 1996).*

This recitation of fact comes from an article arguing that all the mainstream 1996 US Presidential candidates had been unhelpfully trapped in an outdated

prepostmodern view of the economy. It serves well as a statement on the IT-based dematerialising US economy.

And its message is echoed elsewhere. For instance, Nintendo, regarded in 1991 as Japan's most successful corporation, generated that year the country's highest profits per employee, US\$1.5m per worker—overtaking, by a considerable margin, car manufacturers Toyota. Arguably, this success came on the strength of a single IT product. Yet others have estimated that IT's multimedia component alone will account for one-sixth of total US output growth over the next 15 years.

For convenience, I will call this the *nintendo* view of economic growth. This term is meant only to be descriptive, not derisive or flippant. No economist argues with success.

In opposition to the *nintendo* view are statements about how “one sees computers everywhere except in the productivity statistics,” that “information is not the ultimate economic goal,” and that instead “people want bigger cars, nicer houses, better food,” impugning it as “an act of faith to believe a string of ones and zeroes can deliver” what people want. Sure, more Americans make computers than cars, but many times more drive trucks and tend cash registers.

Emphases differ in different statements of this view, but I am tempted to latch on to the “bigger cars, nicer houses, better food” phrasing and call this a *heavy metal* approach to economic growth. (Again, I intend the terminology only to be descriptive.) In my caricature of this view, only those things that people can touch and feel can matter for economic life; dematerialization—in IT or anything else—cannot.

What then of the promise?

The implied importance of IT, dematerialisation, and the weightless economy differs critically from the simple truism that ideas matter for technical progress and economic growth. Of course, ideas are dematerialised, and are critical ingredients of intellectual property in general, and of invention, patents, and R&D in particular. However, not all these will result in increasingly weightless economies.

For instance, a patent could be that on an oil supertanker or a nonstick frying pan, items that show none of the defining properties of dematerialisation. A supertanker and a frying pan have high idea-content, but they are economically valuable only because they have the physical manifestation that they do. If they never took physical form, those ideas would be nothing more than the pipe-dreams of a fertile but dilettante mind. A dematerialised software product, on the other hand, takes just the inputting of a few lines of computer code to spring into life and be immediately useful.

Books provide another example: contrast a hand-painted illuminated bible in the British Museum with, say, an MIT Media Lab sheaf of electronic ‘paper’, whose surface texture reformats depending on the content downloaded onto it. Both the bible and the sheaf are instances of books. Both have been designed to be carriers of ideas. But the second of these constitutes an example of dematerialisation; the first does not. Should the physical form of an illuminated bible be defaced, the ideas in it are unaffected but the value in that bible certainly is. By contrast, the value of the electronic sheaf will fluctuate over time as its contents effortlessly change.

Are these distinctions nitpicking, or do meaningful economic ideas underly them?

I focus here on those dematerialised commodities that might be considered high-tech or *new*, i.e., different from hair-dressing, gardening, or bed-making services. Then, dematerialised commodities share a number of key characteristics. First, they all show *infinite expansibility*. For a dematerialised commodity, its use by

one economic agent does not detract, physically, from its use by another. Computer instructions and data residing in satellite servers are quintessential examples; chocolate hobnobs and spinning jennies are quintessential counterexamples.

This property implies an interesting corollary for social equity: in a weightless economy, giving more to those disenfranchised segments of society does not directly expropriate from those richly endowed. For such equity to be possible, however, free competition is key: a knowledge-based polarisation of society is a different possible outcome if entrenched monopolies were to retain their privileged positions.

More generally, trade in a weightless economy involves reproduction, not exchange. An economic agent does not relinquish goods by handing them over, but instead simply copies them for distribution. That this reproduction can occur at practically zero cost has, in turn, other interesting implications. A single producer can feasibly supply the entire global market. It is then the demand side that determines whether that producer, in fact, ends up getting to do so, or whether a different producer is chosen. Whatever it is that consumers are paying for, it cannot be the product itself as reproducibility at zero cost would drive price also to zero. Weightless economies show no respect for transportation costs or slow adjustments. Shifting value from one physical location to another involves moving only bits and bytes, not atoms and molecules. Thus, some have described a new international trade as the seamless shifting of electronic bits across national boundaries replacing the traditional piling up in sea ports of bales of textiles and bottles of wine.

But even the traditional picture is being dramatically altered by the new one. When, previously, a ship docking in Singapore—the world's busiest shipping terminal—would take days to clear paperwork and unload containers, now the Portnet computer system figures out each container's destination, length of stay in the terminal, and even location in the ship's bay up to a full day before the ship's docking. Computers work out the optimal order of unloading, storage, and re-loading. Closed-circuit TVs monitor and radio transmitters direct the movement of containers by trucks that themselves bear computer-parsed identification characters. The 1994 average of 13 days to complete cargo transfer from a large ship to smaller ones for redistribution has fallen to only 7 with the introduction of this *virtual port*.

Cities might still exist, but they will be places where people go to spend time with other people, not places where people go to work and produce economic value. Thus, consumers will need to use different criteria—other than which supplier is closest to them or is willing to undercut price a little more—to decide on a particular supplier. The powers of nation states—whether fiscal or political control—will potentially be challenged: This is already spectacularly obvious where repressive governments have been overturned, but other less dramatic changes will also be possible.

Most of what I have just described are only theoretical possibilities for now; they raise further questions. But, taken together, they constitute a promise of what a weightless, dematerialised, IT-concentrated economy might deliver.

(1537 words)