

## Footnote: Critical Mass

*If you don't have enough plutonium you can't start a nuclear chain reaction. If you don't have enough coal you can't light a fire. If you do not have enough capital you cannot start a business, and the critical mass of capital required to start it up and sustain it gets bigger as the market grows. [PDF]*

### The Natural Analogy

An atom of a radioactive element disintegrates into fragments. These form the smaller atoms of lighter elements. The disintegration also produces other fragments. These are known as alpha, beta and gamma radiation. They are much smaller particles and they are thrown out at very high speed. As I understand the process, the disintegration of a radioactive atom is spontaneous. It just happens. In a given amount of material, a small proportion of the atoms disintegrate every second. Spontaneous disintegrations may be triggered by high-speed particles from outside hitting these big atoms. However, an atom's disintegration can be triggered by an alpha particle emitted by the disintegration of one of its neighbours.

In a small amount of material, the latter will not happen very often. Whenever it does, chances are that the alpha particles emitted by the second disintegration will fly out of the material without hitting another atom. However, when enough of the radioactive material is formed into a single lump, the alpha particles from a disintegration will more likely than not cause another atom to disintegrate. The amount of material required to cause this to happen depends on the shape of the lump. A minimum mass is required when the lump is spherical. This is the critical mass for the particular kind of material. When it is exceeded, the lump starts to heat up and emit dangerous gamma radiation.

A more familiar every-day analogy is a fire. If you try to light a fire with five pieces of coal the size of sugar lumps, it will not be big enough to sustain itself. Heat will escape from it faster than the combustion process can replace it. You need several kilograms of coal to light a fire which can sustain itself. You can reduce the critical mass required by lighting the fire in a fireplace. This is because the fire bricks reflect back the heat to maintain the temperature above that required to sustain combustion. Again, the critical mass depends on the kind of fuel. A wood fire can sustain itself when a coal fire of the same size could not.

### The Economic Reality

The same is true of a business operating in a market. To be able to sustain itself, it has to be a certain minimum size (or critical mass). Its critical mass depends on the nature of its product or service. Nevertheless, it depends far more on the size of the market.

Within the bounds of a [natural human community](#), the lone artisan is above the critical mass of self sustainment irrespective of his product or service. Here his market is small enough to know him and large enough to sustain him. But as mass-communication has expanded markets from local to national to global, the critical mass for a self-sustaining business has increased from sole trader to corporate to multinational.

The reason is the human mind. Every individual can know, to the point of trust, only up to about 150 other individuals. This is the natural size of a human community. It places a limit on the number of trusted suppliers any given individual will buy from. In a natural community this means everybody. In

a national market there is room only for nationally recognised 'household names'. In the emerging global market, only giant multinationals are few enough in number to be accommodated within the consumer's trust.

Soon, the critical mass required to launch and survive will be that of the multinational. The choice for small and medium sized business is simple. Get yourself acquired by a multinational or die.

## Starting Small

Even today, there is the occasional individual who starts small and enjoys a meteoric rise to multinational size and status. He is held out as the role model whom all worthy men should follow. He is hailed as the ultimate vindication of free-market capitalism. But he is a very rare phenomenon. The odes of his success universally omit mention of the rich parents who supported him through Oxbridge or Harvard and then supplied the capital for his fledgling enterprise. They omit entirely mention of the relatives and parental friends who offered themselves as his first customers. On the other hand he may have hailed from poverty, yet still achieves world-class success.

The gospel of capitalism preaches that success is the fruit of hard work. But millions work hard. And it is they who actually produce humanity's needs of life. It is they who create the luxuries of human well-being. But they are never rich. They forever struggle to make ends meet. It is few indeed who ever enjoy the taste of success. It is therefore statistically improbable that hard work and the dextrous deployment of knowledge are the prime causes of success. Reason points far more cogently towards the cause as being unusual fortuitous circumstances stirred up within the complex dynamics of the global economy. And the few whom fortune favours just happens to be in the right place at the right time.

In the absence of very rare fortuitous circumstances, it is no longer possible to start small and gradually build up a business. If you enter the market with less than critical mass, you will not survive. You will launch in a wave of innovation and enthusiasm. Your business will bloom for a day like a desert flower after a fleeting rain. Then it will die, leaving the mighty to profit from the innovative ideas you briefly exposed, leaving you to sign on at the Jobcentre.

## Conclusion

Over time, the free market has expanded from local to regional to national to global. By so doing, it has progressively locked out first the individual, then the small firm, and finally the national corporates, leaving it the exclusive property of a small community of multinationals. It has thereby become enclosed as if by a wall of iron, which the lone artisan can never hope to penetrate. He has no control over it, yet he depends on it for his needs of life. It has cut him off like a free-but-disembodied spirit, unable to realise any of his true potential.

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