Funding the Future

ne Quantum Essays: The quantum difference between work

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This is another in the Quantum Essays series. Like most of the others, this one arose from discussions between my wife, Jacqueline, and me.

This one is, I think, one of the most important so far. In effect, we provide a theoretical answer to why some work is of value to humankind, whilst other activity does nothing more than generate heat that contributes to entropy, but adds no real value to life. The perverse fact is that in our society, the former is undervalued, and the latter is massively overvalued because what we show is that the financial services sector is a work of no value, which only succeeds in destabilising society.

Other essays in this series are noted at the end of this post.

There is a fundamental distinction that we have forgotten in how we now think about the economy. It is the difference between work and speculation, which is, in quantum terms, the difference between what is real work and activity that is reversible. This matters: it may not be overstating things to suggest that the distinction might be fundamental to a proper understanding of both what is useful labour and so economics itself.

Our suggestion is simple. It is that work that is of value to humankind produces an outcome that is irreversible. A person undertaking it has expended care and effort. A product has been made. Food has been grown. A service has been supplied. Care has been shown. Education has been delivered. The world is changed as a result, however slightly, because the energy a person expended has been irreversibly transformed into something tangible. In the language of physics, the system has moved from one state to another, and there is no way back to the beginning without new input. Once the work is done, the change is permanent (Note 1).

In such work, you cannot simply reverse the order of the process and expect to arrive back where you started. The algebra of work, like that of life itself, is non-commutative:

direction matters. The baker cannot unbake the loaf, nor the nurse uncare for the patient. Useful work - that which is of real value - alters the state of the world in a way that cannot be undone without creating a new and different world again.

By contrast, much of what we call the financial economy operates in a domain where reversibility is the rule. A bank loan can be repaid. A share that has been sold may be bought back. A derivative can be closed out. Even a rent can be cancelled: the property remains, its value little altered. In this world, transactions are reversible in both form and consequence. There may, of course, be a small frictional cost to reversing them. Prices might move, time passes, and a contract may settle a little differently. But these differences are marginal. Fundamentally, what happens in the speculative economy can be undone. It leaves the world almost unchanged.

The distinction between these two types of activity - one changing the world and the other at most reorganising it - matters because economics has almost entirely erased it. Our national accounts treat both kinds of transaction — the irreversible and the reversible — as if they were equivalent. A billion pounds of productive work that changes the world can be treated as being much the same as a billion pounds of speculative gain that does not. Both are counted in GDP. Both, absurdly, appear as “growth”. Yet one builds society; the other merely churns money.

The same confusion lies at the heart of neoliberalism. For decades, we have been told that all economic activity is equal so long as it generates a price and a profit. But not all economic activity is equal. The creation of something new and irreversible, which is what we properly call work, is of an entirely different nature from the rearrangement of existing claims on wealth. One transforms the world. The other simply exploits its existing state by reordering it.

This is where the quantum analogy matters. Physics distinguishes between processes that are reversible and those that are not because they behave differently. Reversible systems conserve energy; irreversible ones generate entropy, which is the measure of real, irreversible change. Our economy, too, depends upon irreversibility. Without work that transforms the world, that feeds, heals, builds, teaches, maintains, and cares, then nothing else has meaning or value. The reversible transactions found within the speculative economy lack that meaning. They add no value.

The result is that the financial system depends on the productive economy, and not the other way around.

What is more, labour expended on irreversible work creates value. That expended on speculation does. not.

Despite this, as the balance of power has shifted toward finance, we have increasingly treated reversible transactions as if they are the true engine of progress. We reward those who trade claims on wealth far more than those who create it. We tax labour

more heavily than speculation. We call financial profit growth and undervalue the irreversible work that sustains us. We have been, in effect, mistaken the standard algebra of AB = BA for the reality of change as explained by Schrodinger's matrix algebra, in which AB ≠ BA because transactions are not reversible in the quantum sphere. (Note 2).

What follows is that much of the modern economy is now trapped in a *meta-stable state, meaning it is a system that appears steady because non-transformative financial activity has sucked resources away from the processes of irreversible change that create value, and as a result, it has ceased to evolve. It can only evolve again, as life requires, by breaking this apparent stability, which is only possible by re-energising the irreversible side of the economy, which is the work that creates and sustains, rather than continuing to focus on finance that circulates and cancels itself out.*

A number of policy conclusions flow from this:

* *First, we must redefine our understanding of work and of what work is of value.*

* *Second, we must redirect capital and political attention away from speculation and toward production and care, which are those activities that change the world irreversibly for the better.*

* *Third, taxation should penalise reversible transactions that add no social value, such as much of financial speculation, short-term trading and rent extraction, while rewarding work that builds resilience and well-being.*

* *Fourth, we need to redefine economic success, not in terms of how much money moves, but in terms of how much irreversible improvement is created, or, in other words, how much better the world has become.*

Economics has long needed a new foundation. Recognising that some forms of economic activity alter the state of the world while others merely shuffle its tokens is fundamental to achieving that. Doing so would change our whole understanding of value added and, by extension, what we prioritise. That is why this discussion matters.

In quantum terms, valuable work collapses the wave function: it decides something, fixes it, and makes it real. Speculation, by contrast, leaves the system in superposition; endlessly reversible, but never resolved. If we want a sustainable future, it is the irreversible that we must once again learn to value, even as prevailing economic logic has long forgotten it.

Notes

* This suggestion is consistent with Schrodinger's understanding of quantum

mechanics and the matrix algebra he used to explain it. In matrix algebra, unlike standard algebra, AB ≠ BA. In other words, the order in which real events happen matters because if they are of value, then they are irreversible. The scrambled egg cannot be unscrambled, and so on. Only work of no value can be unscrambled. At the heart of the theory proposed here is the idea that almost everything in the financial services sector can be unscrambled. In other words, AB = BA. Schrodinger's matrix algebra does not apply.

* A whole new series of essays, based on quantum biology, is now nearing its final edit and will explain the concepts used here in much more depth. The quantum idea expressed here is, in summary, that some photons, when hitting metal surfaces, do not release electrons but are instead reflected. The absorbed photon that releases the electron creates an irreversible action akin to productive work. The reflected photon might create light, akin to the way we see light reflected from a mirror, but this is also akin to the noise made by financial markets; the reflection is of no value, as speculative activity is not a creation of value.

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