Ted Talk – Money and its downfall

Today, ladies and gentlemen, your lives will change… you will leave as different people.

Imagine, in 2008, as in many places of the world, a young man, Joey, goes to work. He collects his pay at the end of this day and on his way home buys a loaf of bread to feed his family. That evening on his radio, or perhaps his phone, he hears that Lehman Brothers has gone bust. It means nothing to him, and why should it?

The next day he works as normal, but the day after, his boss tells him there is no work that day or tomorrow. He asks why not, he knows they have orders, he sees the machines lying idle and the stores are full of parts, the electricity is on and anyway they have a back-up generator. His boss shrugs, "the bank", he says, "has pulled in my loan."

Joey goes home without any bread to put on the table. He starts thinking. He cannot make sense of the world. He sees other people, many not working, yet he sees the world looking exactly the same.

Money has gone walk-about. Lehman's, as we all know were part of a scandal that loaned money to buy cars and houses that were never going to be repaid. Worse, they sold this 'debt' to other banks. But this money was never coming back.

Joey follows the path of this money, he starts to understand that the rest of humanity does not understand money either. He realises that while we depend on money, it is a mirage. He knows we all work for money, some strive for it, some save it, some loan it, some borrow it. But when he studies his few coins he knows they are almost worthless pieces of metal, they hold no value themselves. Where then is this elusive stuff we all depend upon for everything?

Joey looks up the history of money. He sees that it is very old. He understands that in its early days it was real money, money that you held in your hands, a silver penny that was pure silver until Henry VIII debased the coinage in 1526. He understands that since that time money is not real, it simply does not exist. It is now just an idea. He realises that humans created money as a tool, and as such, that tool escaped our control and started to exist as a separate identity using humans to do its bidding, or at least that's what Joey imagined. He was a little fanciful.

Yet, today, money is at the centre of everything…. But can you actually find any of it?

Consider savings and debt, two sides of the same coin. What is actually saved? Imagine that you wish to save for the future time when you become unable to work. You will need money to pay for your bread and lodgings. Where can you put your money so that you can use it many, many years later?

In a bank, you say. Oh, but not in the bank that went bust recently. So, no not a bank, so where. In stocks and shares. This means you are buying parts of businesses. What happens if they all go bust? Unlikely you say, yes but possible. Buy some gold and keep it hidden. Not a bad idea, gold has held its value for many years - but what happens if someone uncovers a large hill of gold somewhere and the price falls to almost nothing? Unlikely, true, but again possible. Buy some property then, good idea, but what if it gets washed away and the insurance company goes bust…

Savings do not exists. They are only a *promise*. Promises get broken. During the few years that you have on this planet, you save for your retirement. If you are lucky, you will not be visited by one of these traumatic events or broken promises. History is long compared to a human's lifespan, many people get lucky.

So, savings are all promises to create wealth in future. The interest rate the bank pays you for your savings, the rise in value of your shares, the rise in your pension pot are all future promises. Someone puts your savings to work to create future wealth. It is this future wealth creation you are saving. You cannot save money itself - as it does not exist.

We are going to see that money within - I suggest, fifty years - shall become meaningless. This is because of two things:

1) Money does not exist itself
2) Money is simply the promise to create future wealth.

Why should our long reliance on money cease to work as we understand it? Money today is only something that exists as a future promise to create wealth. We know this now. And this makes sense, our work endeavours, our creative output our new tools are put to work using the money that flows through the economy. It follows our endeavours, we can borrow it and put it to work. We pay interest to do this - this interest defines 'the value of the money' at that point in time. If our endeavours work well, we increase the money borrowed by more than the interest rate. We are happy as we can then buy our loaf of bread.

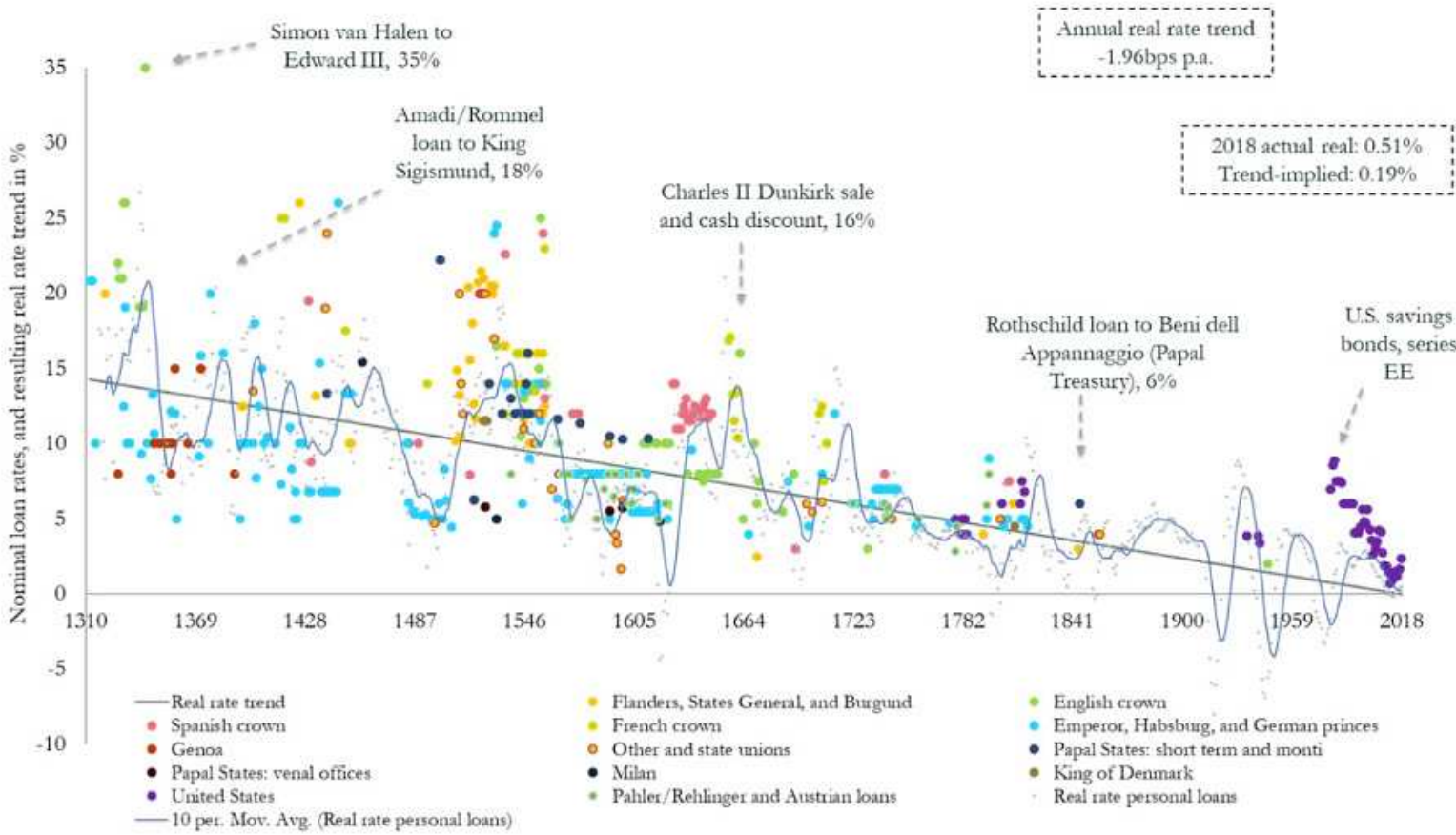
This system has worked for as long as we have had something called money. Humans did, of course, invent this idea. We invented a money system, it is not a natural occurrence, animals do not have a money system, only humans have invented money, it is a human tool to help us create more things, more tools and more produce.

You can argue that money represents one of the finest of all human tools. For the past several thousand years you are probably correct. Money has made modern societies possible. It has also made wars and given us many unsavoury aspects of life also.

Why is it all going to stop then? Why will money become worthless? This sounds like some deranged mad-person's idea of Armageddon or just complete nonsense.

Fortunately, or depending on how you look at human progress - *unfortunately*, it is bound to occur as humans are about to create a very special tool, one that surpasses all other tools and one that we have been working towards for a long time.

Money's demise is actually called progress. To help us understand progress, lets look at a graph from the Bank of England (BOE) that shows us how the value of money, (the interest rate), has changes over a long period - *eight hundred years:*



https://www.bankofengland.co.uk/-/media/boe/files/working-paper/2020/eight-centuries-of-global-real-interest-rates-r-g-and-the-suprasecular-decline-1311-2018

The reason for this decline is due to the effectiveness of our toolmaking and the rise in human work efficiency. We are able to create wealth now with many less work days than we did eight-hundred years ago.

Historically, our current wealth creation processes do indeed stand-upon the shoulders of our forefathers. Humans invented tools and refined those tools during past generations. Such progress is iterative, in the sense that to make a more efficient tool requires a tool and so on.

Over the period from 1300's humans have seen massive iterative progression in tools and in the efficiencies of individual worker output. This is clear even from the simplest view of history; from the scythe, the river boat, the windmill, the horse and cart, to the ships, steam trains to the phone and computer driven machinery and currently to the automated data systems and now AI.

Interestingly, the BOE graph shows the value of money decreasing about now to zero. Look at the graph, the line reaches the zero on the left axis. The left axis is the interest or borrowing rate for money.

This is an astounding graph. It shows the value of money - the interest loan rates – decreasing over this long period. *And, It crosses the zero line about now.*

As you know, interest rates did become effectively zero a few years ago. But today they have risen again. So what is going on? The graph shows that over smallish periods interest rates fluctuate significantly. During Covid, most economies spent a massive amount, when people sat on their backside's producing little and the wealth creation process stalled.

Today we have inflation due to this lack of wealth. Yet the money flowing around did not change, we now have too much money chasing to few goods and services. Humans have never been good at controlling our idea of money, the marvellous tool we created. And because of this, it gets out of kilter with the real world. We attempt to rein it back in by putting up interest rates. This is a very blunt instrument in which to achieve stability between our endeavours and the money. Money, now let loose seems to have its own ideas on how to behave. Economists always says they now finally understand it - yet in every case it confounds them and they tell us that with hindsight it was all very obvious – until it happens again.

However, let us return to the future. It is interesting that the BOE graph should be predicting that interest rates become zero around now. How could such a long-term graph identify that humans are about to do something that has the power to reduce the value of money to zero?

I do not know the answer to this conundrum, yet it seems that humans have been moving inevitably towards this point for eight hundred years at least.

"But"… I hear your voices, money is still worth everything even though interest rates become zero. It still buys goods, it still buys stocks and shares, it still sits in your bank accounts - even though you shall earn nothing from it. So what is the problem?

Ah, but recall, money does not exist. It is only a promise for future wealth creation. Can you imagine where this is all heading? It is simplistic, yet so profound that most people, most economists, all politicians and many business people cannot see the future that this trend defines.

It means that in future; wealth creation will not depend upon the money system, as money itself will have done its job. And this job, unknown to us at the time of its invention, is almost done.

So what is the job? What have humans been racing towards over the last thousand years? Perhaps it is climate change and the reduction of human society back to a nomadic existence? Maybe, but personally I do not think the graph is depicting such an event. The graph shows a steady decline in the average value of money, over such a long period what could that be caused by?

The graph is almost certainly simply showing that our tools have becoming increasingly efficient. Over the period from 1300 humans have seen massive iterative progression in tools and in the efficiencies of individual worker output. This, as we have already noted, is obvious from history; from the stone tool to Artificial Intelligence.

So what exactly happens when money crosses the zero line? This simply means that humans become so efficient that we do not need to work, the tools do all the work - on their own.

Again, I hear your voices. And again I say to you - think about what this really means. Yes, probably for many years money will circulate, it will stay in our banks, the pension funds will pay out our pensions, the stocks and shares will still be bought and sold, and governments will still worry about the overall debt and trouble us for taxes.

Unfortunately, all for nothing - as, if you could ask the money itself, it would tell you that it can do no more.

Once humans do not need to work, money will tell you directly that there is no point in you borrowing it, you cannot put it to work. Its value therefore is zero. This means that your savings are zero and all debt also becomes zero.

"What?" I hear you shouting now…

But stand and consider. Away with common perceptions, let us delve into exactly what is on the cusp of happening in *the real world* - both to money and also to our tool invention, or more accurately due to our modern technical inventions.

As tools become smarter, humans need to do less for the same output. Consider the situation already reached today. Some business ventures are already near to the magic zero. Take companies such as Google, Microsoft, Facebook. These businesses produce billions of dollars a year. Yet they do so with very few people. Their goods and services are not poor value compared to other ventures, they have just found a way to use technology to create wealth very, very efficiently.

And we are now working on a new tool that may usher in this magic zero to many, many other types of wealth creation - not just text, pictures, numbers and information, but real world practical wealth creation - buildings, farming, distribution, energy production, machinery, mining, cars, planes, ships ….

"Impossible" I hear you. But really? Why should humans stop inventing just as we are reaching the final frontier of removing the need to work at all? The graph, I suspect does not lie, it probably knows more than we do.

I have a name for the final frontier - '*Smart Robot'.* When will it be born? Not this year, not next year, or the year after. It really matters not when. Yet, we can all see that it must be coming in the relatively near future. History takes time on a human scale. History does not lie, the graph will continue its journey.

The AI businesses and the robotics businesses may argue about when, how, if. It matters not. As night follows day, we can see that humans together with our partner money has pushed us relentlessly towards this end. The Smart Robot will arrive. So, what is so special about this particular tool? Why will it change everything? Why does money consider that it will call time on money itself?

The Smart Robot is simply a tool that can make itself. It does need to be particularly intelligent, but it does need to be good at doing many things. Like you dog, it must be aware of its surroundings and act on your commands. And, It *does* need to be able to create *more Smart Robots.*

Now, we all know the exponential rule - 2, 4, 8,16, 32, 64, 168… within another few iterations thousand then millions. The Smart Robots, able to build themselves, in their own factories, that they themselves have built, will 'soon' become ubiquitous. Millions upon millions. How will they live, they need energy - they will build more energy plants for themselves. Is this possible? Well, consider that the energy hitting the earth from the sun is twenty-thousand times more than we consume each day. There is plenty of energy, the new systems built for nothing will capture it.

Yes, it may take tens of years to reach millions of Smart Robots, but these years will flash by for the youngest amongst us. We are certainly on the cusp of the zero on the graph, apparently unstoppably.

The Smart Robot will start replacing all jobs, not just a few. It will take time, of course, but that is not the point is it? The point is that money becomes irrelevant. Now, before you shout at me again, consider just what that really means:

No personal debt, no government debt, no taxes, no savings, no business models that produce profits, no pay, no investments, no pension schemes….

That dear friends is what we are talking about today. This future is coming, this future is almost certainly just around the corner in historical terms, *yet no one, and I mean no one, is considering its implications!*

The first implication is relevant even today - the massive debt mountains that governments have built - will 'soon' become meaningless. Does this mean we should have already changed our thinking - are we already making mistakes about what we could achieve today?

And, should you be worried? ***Yes***.

This change will be so momentous that societies in general, business owners, capital owners, land owners, the rich and the powerful and of course the politicians - ***will simply not let it happen.***

They will *find* many, many arguments to prevent you and me - the normal people - from gaining our long fought-for future position that our forefathers worked for - to choose to do nothing if we so wish. *Be afraid, be very afraid,* we are, in all probability, on the cusp of all being turned into slaves – being forced to 'work' when nothing needs to be done so that the capital owners and land owners can use us to keep them in their positions of power.

As I said, you will leave as different people ***- the few people who now really understand the future.***

Technical Summary of this Future Value of Money Theory:

I simplify the Future Value of Money in terms of work output and efficiency.

The following steps through this thinking, building a simple new equation for the future value of money.

The relationship between output, tool making and efficiency:

We can see that the progression of tool efficiency has been more or less continuous over the extended time period on the graph above. It may have had ups and downs derived from local factors such as wars and changing political and social systems, but the trend towards increasing efficiency for each average worker has been unstoppable.

This theory requires a definition of this tool efficiency. I use a function [*eft*]y that represents the total average efficiency of all the tools employed in year [y]. This is almost certainly a complex function. But for this purpose it makes little, if any, difference to the final outcome.

Relationship between output, (wealth creation), and money deployed:

This theory also needs to equate the money employed at some point in time [y] with the output, i.e. the wealth created at that time [y]. I do this using the term 'capital employed'. This represents the overall investment at the time [y] to do the work along with all the tools used. This does not differ from standard economic theory.

But, we can also define Capital Employed in terms of tool efficiency and units of labour. This is because, historically, capital has provided for all the tools employed at any given time. And so, let's substitute capital employed by unit labour along with the efficiency function [*eft*]y

The efficiency function [*eft*]y is simply the overall efficiency of all tools employed in the year [y]. The greater [*eft*] becomes the less labour is required to finalise the final product or service as the tools become more efficient. Thus, as [*eft*] increases, the units of labour required decrease for any given output.
Since the capital employed is effectively one and the same as the value of money in some future year, we can see that both their values must also decrease with increasing efficiency.
We can see therefore, that as humans have steadily increased the effectiveness of their tools, the future value of money must have decreased.

This is what the BOE graph above is indicating, the future value of money is tending towards zero as the tool efficiency tends towards infinity. What this also means is that the total capital employed is also tending towards zero.

The Formal Definition:

Attempting to value money itself seems to me to be conceptually difficult. The considered view is that money, (including savings and debt), is a 'promise' to create wealth at some point in the future.

(This is a different definition to what money can purchase today; which is about supply and demand and human factors.)

The start point is based on equating future value of money in year [y], [VofM]y with Wealth Creation [WC] in year [y]:

$$[VofM]y = [WC]y$$

This should not be particularly contentious, as wealth creation is about employing the tools that exist along with labour to produce something useful. So we can also say:

$$[WC] = \text{Capital Employed} * \text{units of labour} * [1/eft]$$

Where [*eft*] is a complex function relating to the efficiency of all the tools employed. It divides the unit of labour because the labour required for a given output decreases as the efficiency of the tools increases. But, we can also define capital employed in similar terms of simply labour and efficiency - as it just represents the historical cost of creating the tools put to use at some point in time [y]:

$$\text{Capital Employed} = \text{all tools applied} * \text{units of labour}$$

So, substituting capital employed in the previous equation:

$$[WC] = [\text{all tools} * \text{labour}] * [1/eft] * \text{units of labour}$$

Simplified:

$$[WC] = [\text{units of labour}] * [1/eft]$$

(Yes, there is almost certainly more complexity in this equation than shown, but adding additional functions would not seem to me to change the final issue of equating wealth creation to just labour and tool efficiency)

Therefore at year [y] we can state:

$$[VofM]y = [\text{units of labour}] * [1/eft]y$$

This shows that at some time in the future [y], if the efficiency of all tools continues to increase, (tending towards infinity), the units of labour must also tend towards zero:

$$[VofM]y = \text{units of labour}/[eft]y \rightarrow 0$$

Thus the future value of money becomes zero when the tool efficiency is infinite.

The Wider Discussion – Society, Scarcity, Future Planning, Wars

Resource Scarcity Implications

There are a few scarce or physically limited resources that impact significantly on real societal values and human needs. These have a direct impact on the future implications of money value as and when the efficiency [*eft*] function tend towards infinity.

Such resources are finite world resources such as accessible land, farming land, available coast lines, river resources, inland water resources, building and housing land, travel air space, travel road or other transport system availability, water.

As the money value tends towards zero, these real-world scarce resources will continue to rise in price and become exponentially expensive. This impacts upon the very core of societal behaviour and consequential political processes.

Our money value definition provides a wake-up call for this coming scenario. The Covid pandemic created increased house price valuations across the world, especially where there was a perceived improved lifestyle. This perhaps provides some indication of how quickly humans can re-evaluate their perceived values when their situation changes and when the new money valuation definition proposed here has been widely accepted there will be rush to purchase these resources.

Savings & Debt - Extended Explanation

Many people view savings and debt in terms of future money value. There is little consideration of what this really reflects in the real future economy or how the value is made good in some future time.

We have shown above that money value is simply based on a function of labour. Both savings and debt are therefore the future labour that can be purchased at that time. If this seems counter-intuitive, consider what other than money can actually be saved (kept) for a lengthy period such as 30 years to provide for say a pension. You could try to hoard specific items that will not deteriorate such as gold, platinum etc. You could try to keep valuable items such as works of art or scarce products or land, property etc. However, lets say that whatever you kept the future society had found much more of your material (gold etc) or that your work of art depreciates due to damage or just goes out of fashion or your property goes underwater. We can see that this attempt to save is not reliable. Thus we can safely say that most, and eventually all future savings do rely on the labour definition applied to some future date, where the actual money value is dependant on the future human work output.

The Future of money

The timescale for the changes considered above where the efficiency function is so large that it reduces the money value to approximate to zero is the most difficult thing to predict. Many issues may prevent a simple progression, from wars, global warming, famine and the likely prevarication of many societies to accept that humans are no longer required in many wealth creation processes.

It is likely that such changes will occur during the lifetime of our younger children today. The industrialised societies must contemplate this change and accept that as the money value tends towards zero, societies find solutions to the issues of replacing the current money systems and creating new challenges for their people that do not rely on *paid labour* input. The wealth creation process will still occur, materials and processes will still be created albeit with little human input.

For all of history, most humans have accepted they need to work. We have also accepted, in western cultures, the acquirement of capital as a result of this work. Capital has been the driver of new tools and this has created a divide between those able to put capital to work, (interesting phrase as it captures informally the money value definition above), and those without capital. The industrial revolution created a significant divide in many societies due to its effectiveness at creating and harnessing new tools.

We are seeing now the creation of a similar set of people who own the robotic, communication and AI systems (Google etc al). This is again driving a deepening

divide in many western societies.

As this current revolution reaches its climax, where robotic systems can provide new robotic systems without any worker input, all these western societies will need to change fundamentally as it is clear from the above analysis that the money values within these societies becomes worthless.

Future options

What are the options for western societies? There seems to be a number of potential ways forward that would keep societies from disintegrating entirely:

- **Replace the money system with another type of exchange process based on a fair share-out *of available resources***
- **Create a two tier society that has capital owners and non-workers without capital**
- **Change the political process to a single party system that imposes the rules and regulations**

My preferred route has always been to create a new exchange process that is based on *resources* rather than money. The difficulty is within the change process that it is likely to be drawn-out over many years. Robotics is not suddenly going to become fully efficient requiring zero human labour. During this extended period, societies face increasing unemployment and dissatisfaction with capital owners. This is the challenge facing our societies, probably over the next 50 to 80 years. It has almost certainly begun already, but like many such changes, it will be much easier to see with hindsight.

What is interesting at current times, few politicians or economists seem to understand the enormity of this coming change or that it is a culmination of the historical tool making process. They do not understand that this started when the first tool created a reduction of labour needed to create a given wealth output and it has continued relentlessly ever since.

Until this process is more widely understood and accepted - the basis of why the money value is tending towards zero - it will continue to hamper political thinking to find an acceptable solution.

Other non-western societies

Interestingly, this analysis looks better for countries that have an imposed totalitarian political system. Countries such as China & North Korea that can dictate the value of money without recourse to the means of production are likely to be able to manage this change more easily. Their economies will eventually utilise similar smart robotics and create the environment for fewer jobs, but they can simply decree a 'money standard' centrally, and directly provide the wealth created, from the robotic systems, via central politically controlled mechanism.

China currently has a significant, looming, demographic issue for providing labour in the near future, (due to its ageing population). Maybe, China has already worked out this *money value and robotic trend*? Is this why they seem so bent on keeping their authoritarian control while building up world-leading defence systems. Have they already understood that the rest of the 'free world' is basically stuffed as we enter this new age - as we shall not be able to transcend this change

without serious dislocation? They are likely to enter this new age of humanity as the clear winners. As I said, *be very afraid.*

Current misunderstandings

Work Efficiency:

The current issue with attempting to measure work efficiency is skewed. Many 'workers' have a very high level of efficiency, for instance companies such as Google create data processes that would have required millions of Work-Days with just a handful of employees. Other workers have been pushed towards very inefficient jobs where the tools used do not necessarily provide for an improvement over a standard Work-Day. In my analysis this means that [*eft*] approximates to one. So we can see that workers are being split between two extremes, one where [*eft*] is tending towards infinity and the other where [*eft*] is tending towards one.

Due to this, any measurement of overall efficiency does not provide a sensible value. What is becoming clear already is that because many processes have now already been replaced by technology, (very efficient tools), many people are seeking alternative employment in areas that are very low, such as cleaning personal health carers.

This trend is likely to continue as technology replaces more and more higher level jobs. There is little incentive for the capital owners to improve low level employee efficiency, especially those on zero hours as the cost of employment is so low, any efficiency saving is not worthwhile for the employer. This is likely to continue to drive many people to lower paid work.

Pay rates:

Many low-level, zero hour or self-employment jobs cannot easily be made more efficient due to their very nature.

Higher level jobs are currently associated with data processes and these are subject to efficiency measures by applying modern technology. The trend is likely to continue until most of the higher-level jobs have been replaced by technology and the low-level jobs achieve lower-level hourly rates due to increasing competition. Even if the minimum hourly rate is increased by law, the rates for self-employment will continue to fall in areas that become increasingly competitive with a low-skill entry level.

The predicted acceleration due to AI and robotics will eventually remove most of even these low-level jobs due to robotic systems becoming increasingly able to achieve a similar result.

Levers for change

From this analysis there does not seem to be many natural levers for moving free capital-based societies in the right direction for the trend of zero money value.

The basis of capital-based societies is the owner / worker duopoly. Much of the power within the society, both political and social is derived from the owners of businesses, (the employers), and owners of the capital and the land.

For this group to acquiesce to the working group requires a massive leap of faith.

It is unlikely to happen until it becomes a necessity for the survival of this capital ownership group – i.e. civil war.

As a capital-based society we need a different approach to the natural economic transitions that have always occurred before. Many economists would argue that the basic processes of supply and demand and labour markets will sort this out – clearly, it will not this time. There must be strong politically-led intervention for our societies to survive without recourse to many years of destructive turmoil.

Universal Living Wage

One possible solution is a move towards a universal living wage for everyone. This is, I believe, the overwhelming case now for creating a current minimum pay-rate that equates to a liveable wage.

This must also apply to all work, including self-employment, there can be no get-out for workers, they must all be paid at this higher rate. This minimum wage, in future - when the time is right - can then be offered as a universal living wage for everyone, independent of their paid work. The timing is tricky, but as we move much closer to the roll-out of the smart robot, government debt should be seen, (unless we are all completely blind), as soon to become irrelevant, thus making this transition easily 'affordable'.

This would help alleviate the main survival requirements of the non-capitalised group and allow the forward motion of technology to continue to improve efficiencies without recourse to being blocked politically. This is important as already some observers wish to see such levers as taxing the new technology, (a robot tax for instance), that will just create a slower change process and prolong the agony for much of the society.

A universal living wage would provide the space and time to allow the technology to continue at pace, it may even speed up this process as very low level workers would be removed from the work equation completely, thus requiring technology to replace them - as the effective hourly-rate would increase to compete with the living wage.

Future areas of difficulty - Resources

The main area of concern in future is even if we find a way of adverting a major societal breakdown, as the future unfolds, and it becomes increasingly obvious that money is effectively worthless in the wealth creation process, the people will naturally grab at other perceived values to hold onto their wealth and future political leverage. These are few and far between but include land, sea-fronts, river-fronts and buildings in sort-after areas. The capital-classes will seize upon these to provide a leverage on others for their personal needs.

Thus we are likely to see significant difficulty for the reasonable sharing of such land and property. Adding to this difficulty will be the fact that few people will be spending their time working and their lifestyles will assume the increasing use of such property and land, this includes beaches and open spaces such as parkland. It is clear that a solution must be found if we are to prevent escalating tensions or land wars. This whole resource debate will become significantly important as climate change removes some areas as useful for living or relaxation.

It does already seem that we are transitioning to such a lock-out for people with little capital; the price of housing, the issues arising for vacations in the best resorts, these are now rising across the world.

Finally – some good news!

Climate change is now unstoppable. Yet, the smart robots may provide at least some measure of hope. They will be able, (eventually), to help both transition from the areas we can no longer live to other areas, (such as underground), while also creating, (eventually), massive energy systems required to start removing carbon dioxide from the atmosphere. They may also help with creating basic food production systems using high-rise farming or biologically based food production.

For western, capital-based societies, this is only likely to happen if we use politically-led change to avert societal unrest.

Further Reading:

http://www.commonsensethinking.co.uk/history1.html