How Digital Currencies can Eliminate Moral Hazard in Banking and Stabilise the Financial System

This paper is in seven parts. The first provides an executive summary. The second gives an overview of why Moral Hazard is so bad; and also details how we can eliminate it from the banking system - without massive regulation or guarantees or insurance; or the need to do away with banks, or gaol bank officers! The third lists the benefits of the new approach for each class of stakeholder. The fourth provides an outline of the transition process. The fifth covers background details about the current system to provide a common base for understanding the changes proposed. The sixth brings it all together in a brief wrap-up. The seventh is an appendix that looks at other emerging digital currencies that are both good… and very bad.

This proposal applies to all Deposit Taking Institutions Licenced to operate in Australia, hereinafter referred to as 'banks', or 'commercial banks'.

The proposed system would continue to be regulated by Australian Prudential Regulation Authority (APRA) in accord with new legislation.

Commercial banks would continue to operate as they now do, either under existing legislation, or under the new regime, or both (as they choose).

The Central Bank would continue to perform its current roles, with the addition of some new 'targeted' tools to improve management of inflation and unemployment.

1.0 Executive Summary

1.1 The Problem

Moral Hazard is a *system* problem that encourages *bank officers* to make high-risk loans because they get all the benefits and none of the losses when the loans go bad.

It is the root cause of most of the 100 or so systemic bank failures that have occurred across more than 90 countries over the last 50 years. The world is still suffering from the effects of the most recent and widespread failure: the GFC.

To solve any system problem we need to understand how it works.

When banks now make loans, they create an asset. *At the same time*, they must also create a matching liability - a deposit, for the borrower to draw down.

When repayments are made, the entries are reversed.

The fact that the bank's net worth is unchanged in these transactions is one of the keys to understanding both the problem and the solution.

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The system problem is four-fold:-

1. Even though bank deposits are treated as money; legally they are not.

2. Because both the loans and deposits are on balance sheet, if there is the slightest hint that all depositors may not get their money back, it can cause a run - imperilling not only the bank, but the whole financial system.

3. To avoid this risk, governments are forced to guarantee and/or insure deposits (at least to a certain level). In practice, they are often forced to do much more: take equity in the bank, buy bad loans for much more than they are worth, and so on.

4. These acts effectively insulate bank officers from the downsides of high-risk lending.

After every major system failure, regulations are written to prevent a recurrence. Unfortunately, people being human, as time goes on, and new employees replace old hands, and as the markets turn, pressure mounts to expand lending to higher risk borrowers for bigger returns. In some cases, regulations put in place to mitigate high-risk practices are removed or watered down: "because they are stifling business". This happened in the lead up to the GFC when key regulations enacted in the US following the Great Depression, were repealed – and have still not been re-instated.

Inevitably markets crash, deposits are put at risk, and the cycle is repeated.

In a letter dated 21 March 2015, Australian Financial Journalist Alan Kohler warns: "Remember covenant lite? It's where loans are provided with very few restrictions on collateral, income levels and payments terms, and often very little information on those things as well. This was supposed to be one of the things that brought the US financial system unstuck in 2007, along with collateralised debt obligations, but… 30 per cent of lending was covenant-lite in 2007 and now it's 70 per cent."

Unfortunately, no amount of regulation can eliminate the problem, because the whole system is built on trust in each and every bank. As soon as trust is lost, panic ensues. As the system stands, only governments can engender sufficient trust… and even they sometimes struggle.

1.2 The Solution

The solution is straight forward:

1. Take both loans and deposits off balance sheet, and put them into Registers managed by the bank - but leave the banks with the liability for default, theft and fraud (as now).

2. In the process, convert the money recorded in the Deposit Register into legal tender. This effectively creates a new form of money: digital currency. It means that as well as having metal (coins) and paper and plastic (notes) as 'records of value', we would also

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have electronic 'records' (digital currency).

3. Remove government guarantees and insurance from any deposits that remain on balance sheet.

By doing these three simple things, we can create a new digital currency that is 'legal tender'. In the process, eliminating moral hazard from banking and stabilizing the financial system.

No longer would it be necessary to convert the 'at risk' electronic record (deposits) into 'official' paper (notes), or metal (coins) records (money). All the 'records' (coins, notes and digital) would be legal tender, just the same.

The banks go on performing the same roles of lending and managing the payments system, for the same returns, with the same net worth.

The difference is that deposits would no longer be at risk. All the risk would remain with the people earning income from making the loans... just like any business.

1.3 The Transition

The transition from the current to the proposed system would be similar to Quantitative Easing (QE). In QE, Central Banks electronically created new 'legal tender' to buy existing securities from private holders, with the proceeds turned into 'at risk deposits' in the banking system.

This proposal simply extends the process to convert 'at-risk deposits' back into 'risk-free legal tender'.

The Central Bank would electronically create new 'legal tender' to buy all the loans issued by commercial banks. The banks then use the money to repay all depositors who would be required to re-lodge their new 'legal tender' with the Central Bank. The re-lodgement process would be automatic and also done electronically.

The Central Bank then has a Register of Loans (acquired from the commercial bank) and a Register of Deposits made by the bank's former Depositors.

Management of these Registers is then licenced to the commercial bank, which is also given the power to issue new legal tender. The issue would be done by simply recording new Loans in the Central Bank Register of Loans, with matching new Deposits in the Central Bank Register of Deposits – same process as now, but on the Central Bank's Registers, not the commercial bank's books.

Each country could enact legislation, independent of any other. Banks could choose to continue trading under the existing framework, move to the new, or a combination. Ultimately, it would be the market that decided which framework was preferable.

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1.4 The Impact

Once the money is converted from 'at risk deposits' to 'risk-free legal tender', the processes of lending and managing the payments system would continue as normal. The change would not impact the operation of traditional banks, or other financial institutions, nor currency trading.

The only difference is that the transactions would be off the books of the commercial banks, and instead on the Registers of the Central Bank - eliminating a step in the transaction process. Today, you have to convert deposits into legal tender to trade (whether locally or internationally). After the change to the new system, the deposit record would already be legal tender in electronic form. It would be true 'digital currency'.

However, because the commercial banks get most of the income from the services they perform under licence, they also continue to bear the risks of default, theft and fraud. This ensures there is no moral hazard in the business of banking.

A bank would fail if losses exceeded its equity - as with any business.

In the case of failure, management of the Register of performing Loans and the full Deposit Register would be taken over by the Central Bank - without a blip (using the commercial bank's staff and facilities). Management of these could be later on-sold for their 'income value' to a viable commercial bank via an auction, with the proceeds going to the Administrator for dispersal according to law.

The only losers would be the non-performing borrowers, the bank officers who lose their jobs when the bank folds, and the shareholders who accepted the high-risk lending for higher returns.

Depositors and all other banks, and hence the whole financial system, would be immune from loss.

This system could be set up under new legislation within 5 years (or sooner), with provision for a transition period (say two years) following enactment of the new legislation.

The next section explains the mechanics in more detail.

2.0 Summary Background and Overview of Proposal

2.1 The Hazard

Moral Hazard is a *system* problem that corrupts behaviour, and is one of the greatest risks to our economic and social wellbeing.

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In effect, the *system* works to reward bankers with big salaries and bonuses for taking on unwarranted lending risks (and immoral practices), while exempting them from *personal* losses when the loans go bad.

This hazard has been at the root of just about every one of more than 100 *systemic* bank failures in 90 countries over the last 50 years.

The GFC is simply the biggest most recent failure. The harm done to the social fabric of some of the worst hit countries may take a generation to mend.

After every failure, new regulations have been enacted in an attempt to reduce the risks.

However, no amount of regulation can solve the problem, as the system is inherently unstable. All it needs is for people to lose faith in a bank's ability to meet a call on their deposits, and a 'run' can start (with all depositors rushing to withdraw their money at the same time). Quickly, the bank runs out of cash and is forced to stop trading. This can impact other banks that have made loans to it, spreading failure to the whole system.

While ever bankers know that governments will always step in to save *the system*, Moral Hazard is unavoidable.

That's the problem. Before considering the proposed countermeasure, we need to agree how the current system works - so we are all working off the same base.

2.2 The Current System: 'Money out of Thin Air'

Quite simply, bank lending works to create both deposits and money 'out of thin air'.

This is not my contention. As the Bank of England says: "Money creation in practice differs from some popular misconceptions — banks do not act simply as intermediaries, lending out deposits that savers place with them, and nor do they 'multiply up' central bank money to create new loans and deposits… *the majority of money in the modern economy is created by commercial banks making loans*".

The process is as simple as: Debit $100 Loan to Borrower, and Credit $100 Deposit to Borrower. The loan represents the Borrower's debt that must be repaid, while the Deposit provides the means to draw down cash. The 'deposit' does not come from anywhere. It is simply recorded in the books of the bank at the same time as the bank records the loan. It is 'money out of thin air'.

As the loan is repaid, the entries are reversed, sending the money back into the 'thin air' from which it came.

The fact that the creation and destruction of money does not increase or decrease a bank's net worth (because it impacts both assets and liabilities equally), is a key to understanding the proposed countermeasure.

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With this knowledge, we can pass three simple laws to:

1. Take both loans and deposits off the balance sheets of banks, and put them into Registers managed by the banks – under licence from the Central Bank
2. In the process, convert the Deposits to Legal Tender
3. Remove Government Guarantees and Insurance from Deposits that remain on Balance Sheet.

2.3.1 Loans and Deposits 'off balance sheet' and onto Registers

As this change removes both Assets (loans) and Liabilities (deposits) from the banks' books, it would have no impact on their net worth. Nor would it impact their income, as they would go on performing the same services, in the same way, for the same net interest and fees, as now.

As part of this change, the banks would be made liable for any loan defaults, as well as any theft of money from its vaults, or fraud committed by bank officers or third parties in relation to deposits.

This is the same as now, but it would need to be legislated as, with the loans and deposits 'off balance sheet', such obligations would normally cease.

It would also be made unlawful for a bank to on-sell any loans they write… so the risk of default remains with them. This is how banking used to work, before it became 'sophisticated'.

The banks' lending would continue to be restricted to a set multiple of its capital (equity and debentures). This is called its Capital Adequacy Ratio (CAR).

Without the ability to 'on-sell', the only way to increase lending would be to increase capital… just as any business must as it grows. As a sweetener to support the changes, the CAR could be increased by a few percent to allow more lending against the banks' existing capital. This could be done without risk to depositors due to the second law:

2.3.2 Law to recognise Deposits Recorded in a Bank Deposit Register as Legal Tender

The tokens used to denote money are currently metal coins and paper notes. These are just *historical* 'records' in 'standard units of account'. There is no reason why in the 21st. Century we cannot have an eRecord to legally represent the amount of money held by an individual. How this can be achieved in practice is discussed in Part 4: The Transition.

2.3.3 Removal of Government Deposit Guarantees and Insurance

Government Deposit Guarantees and Insurance must be removed from all existing banks. This is necessary to put them on the same footing as the proposed Registrars.

Under the new system, there is no need for guarantees or insurance, as the Deposits created by the banks when they make loans would be regarded as 'legal tender', and would not be at risk under any circumstances.

Existing banks could be given a couple of years after the new legislation is passed to transition their corporate structures to the new regime before new entrants set up in competition.

2.3.4 Overall

This approach leaves the business of banking essentially unaffected. Except that the bankers would be on their own. No longer would there be any ability (or necessity) to call on other parties to cover their losses (due to defaults, thefts and fraud), as the deposits could never be touched.

If a bank is forced to close because of bad loans, the only losers would be the bank officers who lose their jobs; as well as the shareholders, some creditors and perhaps the debenture holders who do their dough. As in any corporate failure.

The Deposit Register and the Register of 'performing' Loans would be taken over by the Central Bank and managed without a blip – until the management rights could be on-sold to a viable bank, via a tender process.

The non-performing loans would be subject to recovery proceedings by the bank's Administrator. Any recoveries would go first to repayment of principal (that would be written off), with any extra going to pay the administrator, and then outstanding interest and fees (that would go to creditors, debenture holders and then the shareholders - in accord with normal bankruptcy laws).

Never again could there be a 'run' on a bank, as the eMoney is never at risk. It is simply a Record in a bank's Deposit Register… effectively eliminating Moral Hazard.

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2.3.5 Impact on Deposits

As the Bank of England paper demonstrates, deposits are not now 'loaned' - they are *created* as the matching loan is made. The same would happen under the new system. The Loan would be recorded in one Register, and the matching Deposit in another.

When I pay you, my Deposit account would go down and yours would go up. There would be no need to 'settle' the transactions in 'traditional cash' (paper notes or metal coins), because the Record in the banks computer would be regarded as eMoney under the law. As with cash, a person could satisfy payment for any goods and services by transferring a valid eRecord (money) from their Deposit account to the seller's Deposit Account.

When a person accepts an eMoney payment it would go straight into their account, increasing the total record… just as if they were paid in cash. Indeed, under the new law, the eMoney would be defined as 'cash'.

Having your money held on the Central Bank Register would be 'risk-free' in the same way as holding notes and coins in a safe is 'risk-free'… only better. If someone steals your cash, you have no comeback. If someone manages to access your deposit without your authority, your money remains intact. It is the commercial bank that allowed the fraud to happen that loses (as now).

Unlike now, you would not have to rely on the commercial bank to 'honour the deposit'.

The eMoney recorded in the Deposit Register is not a liability of the bank. The Register acts more like a 'deposit box'. The contents (your money) are held secure by the bank, but the bank does not own the contents.

It means, no matter what, a person can never lose their Digital Money while it is on deposit.

Another major benefit of eMoney is that it could also be adjusted tax-free by the inflation rate on a daily basis - to ensure the real value of the deposit is retained over time. This would go a long way to offsetting the loss of taxable interest previously paid by the commercial bank. In many cases, the adjustment could be more than the after-tax interest. This money, like the original deposit, would come 'out of thin air' under the proposed legislation. It is not 'extra money'. It simply keeps the purchasing power of your original deposit intact. Interest is not appropriate, as the money would no longer be 'at risk'.

The bank would be paid fees by its customers to operate the Register of Deposits and the Payments system (as now).

2.3.6 Impact on Lending

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The processes of lending would remain essentially unchanged. Though it is likely there would be much greater focus on risk management.

As now, the loans would be made by banks 'out of thin air', by simply recording the amount of the loan in the Loan Register (rather than in the books of the bank), with a matching entry in the Deposit Register, for the borrower to draw on.

The banks would continue to assess each borrower's ability to repay, and the quality of their collateral.

For this service, as well as for ensuring the loans are repaid and for managing defaults, the bank would charge interest and fees to cover: a) their operating costs, including a predetermined level of defaults, and b) profit.

Since the bank would no longer need to pay interest to Depositors, there would no longer be any 'cost of funds' (except in relation to debentures that would be classed as part of 'capital' for the purposes of their CAR).

There is no reason why in these circumstances the bank's profit could not be the same as any prudent bank now. It would also be more certain, without a fluctuating cost of funds.

Under the legislation, a bank would not be permitted to re-negotiate interest rates on 'good' loans to recover losses on 'bad' loans. (The current practice of increasing interest on existing variable loans to recover losses is like Toyota or GM going back to people who bought cars, and asking for extra money to cover losses on a new model that does not sell as expected!) Borrowers are not in the business of assessing risk on other borrowers. That is the bank's business, for which they get paid. If they get it wrong, then it is only fair that the bank should suffer the loss of poor judgement, or bad practices (not the borrowers who are meeting their obligations!). Again, this is necessary to avoid moral hazard.

However, just as Depositors are compensated for inflation to retain the real value of their deposit, so each Borrower's outstanding principle should be adjusted up by the same rate, on a daily basis. This ensures they repay the real value of the money they borrow. The adjusted principle would not go to the bank. It would be written back into thin air as it is repaid - *just like the principal is now written back*.

The 'inflation adjustment' on loans would essentially balance the adjustment paid to depositors, eliminating any effect on the money supply. This happens in practice now, as a large part of the interest paid by borrowers goes to pay depositors to cover inflation.

These changes should mean that borrowers' interest and costs could be stabilised over the long term (a boon for all borrowers, especially business), while enabling banks to operate

much as they do now, with the same net worth, earning similar profits as now (subject, of course, to emerging competition from new entrants that are more digitally savvy!)

2.3.7 Reduced System Risk

As a result of creating eMoney (by taking loans and deposits off balance sheet), we can eliminate Moral Hazard, reducing system risks for everyone across the whole community – not only within the Banking sector.

The only risks would be inflation and normal business risk.

The bank would no longer bear the inflation risk, as both loans and deposits would be off-balance sheet.

As for normal business risk, the interest on each loan would be priced by the bank based on its assessment of risk of default by the borrower (given their security, income, credit history and the purpose of the loan), as well as competing rates offered in the market – just as now.

However, there would no longer be any 'financial risk' due to fluctuating interest rates. The money for the loan would come direct from the Central Bank without cost. It would not need to be borrowed from the market. This means, the cost of funds for the banks would be zero.

Each bank's costs and profit margin and overall risk premium should be relatively stable, so there should be no need to vary the interest rate over the life of the loan for the bank to make a profit.

Overall, the system would be more stable for banks, borrowers and depositors.

Banks would be the first port of call for loans (as now).

Normal 'at risk' lending by individuals and other institutions would continue, with lenders giving over their cash to borrowers for an agreed term, at an agreed rate to compensate for the risk of loss.

2.3.8 Management of Inflation

As under the proposal, all loans would be 'off balance sheet'; Central Banks would no longer be able to use the 'cash rate' as a tool to affect the amount of bank lending.

Instead, Central Banks could be given a much sharper tool. They could be given the power to levy an extra charge on all new loans borrowed for a specific purpose.

If, for example, house prices were ballooning due to high demand, what we want to do is to shift demand to new houses (to increase stock). To do this, the Central Bank could add an

extra charge on all *new loans* (bank and non-bank) for *existing* houses. This extra charge would increase the effective cost of buying existing houses, making it relatively cheaper to buy a new home… the exact policy objective we want to achieve.

Similar charges could be levied if, for example, consumer loans, or margin loans against stock, seemed to be pushing prices too high too quickly.

Any extra charges would not go to the lender collecting them, or to the Central Bank they are paid to. They would be written back into thin air as they are paid. The sole purpose of these charges would be to mitigate the rate of borrowing – just as Central Banks now try to use the (very blunt) 'cash rate' to push up *all* interest rates… but much better targeted.

If inflation is widespread, the charge could be applied to all borrowing. It too would be written off as it is paid to the Central Bank.

Importantly, the charge would only apply to *new* loans, ensuring long term borrowing decisions are not disrupted by short term anomalies in one or more markets.

We don't need to raise rates on existing borrowings to reduce demand for new borrowings. We just have to make new borrowings more expensive, which is what this approach achieves - by asset class, or overall.

3.0 The Benefits

3.1 Depositors

Depositors exchange 'at-risk' commercial bank deposits (earning taxable interest) for 'risk-free' electronic legal tender (digital money) that is equivalent to paper money – only better. It cannot be lost, stolen or destroyed, and it gets increased by the inflation rate, tax-free.

The digital money does not belong to the bank. It belongs to you. The bank cannot touch it for any reason.

Having digital money on a Register managed by a bank is like having paper money in a safety deposit box managed by a bank - *except, it can be accessed wherever electronic banking is available*, rather than only at the branch where the box is held.

The digital money can be used in exactly the same way as paper (notes) and metal (coins) money, and is directly exchangeable into either notes or coins, if required.

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3.2 Borrowers

3.2.1 Performing Loans

Because there is no 'cost of funds', interest rates can be stabilised over the life of the loan. The interest would depend entirely upon the operating costs of the bank, their own risk profile *at the time of the loan* and *market rates at the time*. The loan will never need to be called in to pay out depositors, nor could their interest rate be increased to pay for losses on other loans.

They would also no longer be at risk of their loan being called in as a result of a 'run' on the bank, or to pay out depositors in the event the bank folds.

3.2.2 Non-performing Loans

None.

3.3 Bank Officers

With the loans 'off-balance sheet', there is would be no need to 'mark to market' if the value of the collateral falls - as long as the borrower is making re-payments. This would stabilise the bank's accounts making it easier to manage risk.

Perhaps counter-intuitively, due to greater focus on risk management, removal of Moral Hazard could reduce stress for most bank employees who may otherwise feel pressure to engage in high-risk or even immoral practices to get higher returns.

With no cost of funds, generation of the bank's net profit would also become less risky. Bank officers would only have to manage operating costs and margins, and the risk premium on their loan portfolio… all much easier to assess than movements in interest rates.

As well, by converting deposits to digital currency, it would assure banks a permanent place in the financial system, enabling the industry to better deal with attack from other new currencies and payments systems.

3.4 Bank Shareholders

Shareholders would no longer be at risk of a run. As well, the overall operating risk of the business would be reduced (as discussed under benefits for 'bank officers', above) - without affecting their net assets or income. Again, the conversion of deposits to digital currency

would assure the on-going viability of their business against attack from digital currencies.

They could also benefit from increased CAR, allowing them to increase lending without requiring increased capital

3.5 Bank Creditors

Creditors too would benefit from the same reduced risks that bank officers and shareholders would benefit from.

3.6 Other Financial Organizations

The biggest benefit would be in a much more stable financial system, and hence economy, less prone to asset bubbles and recession, reducing overall risk.

3.7 Central Bank

The biggest benefit would be in a much more stable financial system, and hence economy less prone to asset bubbles and recession.

The Central Bank would also get:

1. licence fees from the commercial banks to cover its costs.

2. new tools to manage inflation and unemployment:
   - targeted interest rate charge added to loans for specific purposes to damp asset bubbles, or all loans to damp borrowing in general, as well as:

   - general levy (like broad-based GST) applied to all transactions to damp inflation
   - general flat payment to all citizens to boost demand and increase employment.

The payments would come out of thin air and not increase total debt. The charges would be written back into thin air. They would be created and levied for use only in managing unemployment and inflation.

The system can operate without the general levy or flat payment. It simply makes it easier to use them. These tools are the subject of another paper.

3.8 Government

The biggest benefit would be in a much more stable financial system, and hence economy, less prone to asset bubbles and recession.

3.9 Community

The biggest benefit would be in a much more stable financial system, and hence economy, less prone to asset bubbles and recession.

4.0 The Transition

4.1 Legislation would make the change Voluntary. The Market would force the Shift

The expectation is that it may take up to five years to formulate and pass the new legislation, with the transition phased over another two years, in a way that is favourable to existing banks.

Fortunately, we don't need to amend or repeal existing legislation (except to remove government guarantees and insurance on deposits). We only have to introduce new simplified legislation to create the new institutions (Loan and Deposit Registrars)… a much easier task.

Existing banks would naturally transition to the new framework as depositors chose to hold their money as fully secured Digital Currency (adjusted for inflation without tax), rather than traditional bank deposits (which would then be fully at-risk with all interest taxable). Borrowers too would want to shift for the greater stability offered.

4.2 The Mechanism

4.2.1 Using new Money to Buy Loans and Repay Deposits

Essentially, the Central Bank would create new money to buy all the commercial bank loans. This is similar to QE, where Central Banks buy securities off commercial banks (and others) with new money.

Different to QE, as the loans would continue to earn the banks the same income as before the transfer, they would be purchased at their book value (not market value).

In another difference, the new money would be used by the commercial banks to repay all Deposits.

The money would not actually be paid out. Instead, it would be immediately and automatically deposited with the Central Bank. Each deposit would be recorded in the name of the Depositor in a new Central Bank Deposit Register. All the transactions would be electronic.

This would get both the loans and the deposits off the books of the commercial banks and onto the books of the Central Bank. The Registers would become subsidiary ledgers of the Central Bank under law – managed under licence by the commercial bank that previously held the deposits and loans.

Commercial bank deposits are already regarded as money for all practical purposes. The transactions would simply have the effect of turning the 'at-risk deposits' into 'risk-free legal tender'.

It would mean that our legal tender (money) came in three forms:

- metal records (coins)
- paper and plastic records (notes), and
- electronic records (digital).

All would be issued by the Central Bank, via commercial banks. The paper and metal money would be produced by the mint. The electronic money would be produced under licence by the commercial banks issuing loans and matching deposits via the Central Bank Registers - so any new Deposits would be 'risk-free legal tender' from the start.

All forms of legal tender (money) would be exchangeable into one another. Ultimately, metal and paper money will likely disappear altogether.

4.2.2 Technical Increase in Money Supply

Just as QE increased the money supply, this process may also. But it would not result in more money going into circulation, as the commercial banks receiving it would be prevented from using it to buy other assets.

While loans and deposits are raised equally to start, over time, due to trading and investment, any one bank may end up with a more loans than deposits.

When the loans are purchased and the deposits paid out, any difference would represent a net increase in the money supply. If there are any banks with more deposits than loans, the reverse would be true.

Unlike QE, any extra money issued to a commercial bank in this transition process could not be used to buy other securities. It would have to be held on the books of the commercial

bank as a new Deposit with the Central Bank (adjusted for inflation). It could only be used to pay down liabilities of the bank, or in the event of liquidation to pay out shareholders.

The additional money would be held as an asset of the commercial bank, but *it would not affect the bank's net assets, or its net income*. This is best understood by looking at the actual transactions.

An attached spreadsheet shows how the transition would affect the accounts of a real bank (Westpac), based on their 2007 published accounts.

5.0 Background Detail on the Current System

5.1 What's Moral Hazard and Why is it so Bad?

Excluding human disruption of the eco-sphere, Moral Hazard within the Banking sector is perhaps the greatest systemic risk to our economic and social well-being.

It occurs when *a person* making a 'wager', receives a benefit, but does not bear the loss when things go bad.

In the case of banks (and specifically *bank officers*), the 'wager' is that any particular borrower will repay their loan and interest in full. The risk of default is normally covered by charging a 'risk premium' on all loans in the form of higher interest.

Problems arise when high-risk lending is undertaken by any bank. This happens when loans are made to people who have little or no equity, and/or insufficient income to meet rising interest payments – usually in an environment of increasing asset prices.

Bank officers are happy to make these loans because they get the benefit of the interest and up-front fees that go to pay their salaries and big bonuses, while the appreciating collateral covers the principal. Sometimes too, loans with different risk ratings are packaged up and on-sold for a profit to unsuspecting investors who are left to carry the risk. This lending creates a bubble, as borrowers bid up prices for the assets they borrow against… leading to greater apparent equity and even more lending.

Moral hazard occurs because the *bank officers* making the loans either pass the risk to other investors, or because they know that if things turn really bad, they won't lose their job (or even their bonuses!), as the bank will be rescued by taxpayers to stop a 'run'.

A 'run' occurs when depositors believe a bank may fail and all try to get their money out at the same time. As most bank assets are in the form of loans, not cash; withdrawals soon cannot be met. Any bank that cannot meet its cash calls is forced to close, going

immediately into administration and possible bankruptcy. This freezes deposits, often for years as the loans are liquidated, often with big losses for depositors… unless the government steps in.

In such cases, some shareholders may lose… but not the people who actually make the loans – the *bank officers*. These include not only the people writing the loans, but especially those responsible for overseeing bank policy and risk management.

This last happened in the GFC when, after a period of sustained and widespread high-risk lending, house and share prices were pushed higher and higher, and then collapsed.

Single bank failures are bad enough. The possibility of widespread failures during the GFC put the global financial system at risk.

As a result, taxpayers in many countries have had to rescue their banks – to protect deposits and the payments system. This has included printing $trillions of dollars, and now euro's, to buy securities from the banks and other major investors at full value to provide liquidity, as well as taking direct equity in some banks, and buying impaired/non-performing loans at high values, together with explicit government guarantees and insurance for deposits.

While shareholders and taxpayers have lost money through the GFC, few *bank officers* have been prosecuted or even had their bonuses confiscated. In effect, those directly responsible have got off scot free… preparing the seed bed for the next generation of 'moral hazard'.

In particular, the rescue has led to the idea of 'Too Big to Fail': that big banks cannot be let fail because it would bring down the payments system and wreck the economy. Without access to their money, people cannot buy goods and services; forcing businesses to lay off staff… causing a downward spiral that could lead to another global Depression… and hence another rescue.

The GFC was only the most recent (and biggest) in a long list of systemic failures. The IMF and World Bank have detailed over 100 such failures in the Banking System across more than 90 countries over the last 40 or so years - all leading to large losses and, in some cases, to severe disruption of the world's financial system. With every failure new regulations are written in an attempt to circumvent the next collapse. In time, these may be unwound by future generations who have no memory of previous failures and hence no understanding of why the regulations are there!

Since the GFC, it has been no different. New regulations have been enacted around the world to try and mitigate the risks, but no one believes that they have solved the problem. They have merely reduced the risk slightly by requiring banks to hold a bit more capital to loans, increasing the buffer before depositors lose their money.

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One difficulty is that regulators are always behind the curve. They do not have the resources to monitor the whole system, or to understand the full implications of each new financial instrument or banking practice that appears in the market.

But the real problem is that regulations just don't work.

A 2010 German study demonstrated from an analysis of actual case studies that: "Most regulatory interventions, such as warnings and penalties, do not reduce moral hazard. Only interventions directly targeting bank management mitigate moral hazard". If we think about it, it is common sense.

When the next wave of imprudent lending appears, the risk remains that we will have to bail out the same organizations, with the same people taking all the profit and bearing none of the losses… *simply because no amount of regulation can stop a run under the current system*.

5.2 Understanding the Problem

Fortunately, it is now possible to fix the system, using the idea of 'Digital Currencies' recorded 'in Registers that are 'off balance sheet'… without the need for massive regulatory oversight, nor the need to 'do away with banks'.

How, was outlined in PART 2.

However, to understand the problem (its root cause) and hence the solution, we have to agree on how the current financial system works. A brief explanation was offered in PART 1. This section provides an-depth look at the role of money; and how it is represented, created and destroyed, within the current system.

This sounds pretty straightforward – but it isn't!

What follows is my understanding after 30 years of research.

5.3 Role of Money

It needs to be recognised upfront that the role of money is limited. A great deal of 'value' (including most of the natural world and all unpaid home, child, aged and disability care, and much besides) is 'unpriced' and hence cannot be accounted in money terms. But that is a separate (major) problem. This paper has a specific purpose, which is to address the problem of Moral Hazard in the Banking System.

In essence, Money is the '*Record*' of '*Value*' that we *create* (when we work and invest), or *owe* (when we borrow), and *consume* (when we spend) - in standard or agreed 'Units of Account'.

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Underlying it is an implied social contract between all members of society:

> "We should each be able to take out of society, what we put in".
>
> (This general principle is subject of course to tax, to pay for social goods and services).

While we have any money, it means that (in economic terms) we have put in more than we have taken out. If we are in debt, it means we have taken out more than we put in - and so must work/invest to create economic value that will enable us to pay off the debt.

When we have spent all our money and paid all our debts, we and society are square.

If we spend money on assets, then those assets represent the amount of value that we have added and not consumed. Society has no claim on them. They are ours by right of having worked and invested (directly and indirectly) to create the (priced) *value* that is in them – ignoring of course inheritance and gifting, or gambling and theft!

Regardless of the facts, the unstated assumption in all transactions is that bearer has a lawful right to the money they offer… subject only to direct evidence to the contrary. That is, we accept at 'face value', that they (or their *benefactors) have contributed value and are entitled to take the same amount out.

(*benefactor is a person or chain of people who give, bequeath, or gamble money that they have earned, to the benefit of another person).

As we contribute our labour and capital to the creation of goods and services, we are paid money to 'Record' the value. As we take out goods and services by spending, the money becomes the 'Medium of Exchange'.

The basic principle is that the net wealth of both parties is unchanged by the exchange (not always true in practice of course!)

In all such transactions, it is only the seller that gives real value (in the form of goods and services). The buyer passes over money simply as a 'Record' of the value given, so the seller may in turn take out real value from other members of the communities/nations *who are party to the social contract*.

This contract is expressed as a 'Right' on the one hand and an 'Obligation' on the other. It is the 'Right' of the Bearer of the money to take out of Society what they (or their benefactors) have put in; balanced by the 'Obligation' (on the part of Society) to pay the Bearer (in resources equal to the Bearer's own and/or their benefactor's contribution). These Rights and Obligations are given the force of law by designating certain Tokens as 'Legal Tender' that must be accepted in any exchange.

Importantly too, *without money it is impossible to signal our needs in the paid economy*. Money is thus also a 'Vote' for what *should be produced*, as well as a 'Claim' on what *is produced*.

With a fixed Unit of Account, we can also hold money as a 'Store of Wealth'. This money represents *value* we have added (and been paid for) that *we have not consumed*.

In Summary, the Role of Money is as a:

- Record of Value (contributed by the Bearer and/or their Benefactors)
- Unit of Account (that fixes the Value)

- Right (of the Bearer to take out Resources from Society)
- Obligation (by Society to hand over Resources to the Bearer)

- Vote for Production (by the Bearer)
- Claim on Production (by the Bearer)

- Medium of Exchange (between the Bearer and a Supplier of Goods and Services)
- Store of Wealth (created by the Bearer and/or their Benefactors)

These are all accounting, legal and political concepts. They express the role of money without reference to the substance of the tokens or forms used to represent it.

5.4 Money's Representation

As Money itself is a concept, and as we cannot see concepts (except in our own head), we need a way to represent it in the physical world.

Traditionally this has been done using all sorts of objects and materials in the form of tokens that we can see and feel.

The token may be a metal coin, or a paper or plastic note, or as in the past: clay tablets, notched sticks, or shells and many other objects.

Currently in Australia, our 'Units of Account' are dollars and cents. The tokens we use are made of metal (coins), and plastic (notes). The number of Units shown on the token is called its 'face value'.

It is the *face value* that is *money*. The *substance of the token is irrelevant to its role as money*.

The one exception to this rule is if the material of the token itself has value (say a precious metal). In this case, problems arise if the *price of the metal* goes above the *face value of the*

coin as it leads to hoarding for the value of the metal, rather than spending as money. This has happened many times in the past. It is therefore much better that the token itself has a low 'intrinsic' value relative to its 'face' value, or preferably no intrinsic value.

The idea that money needs to be 'backed' by a precious metal is a misunderstanding of what money is. Money is nothing more than a 'record of value' given in 'standard units of account'.

Money's 'backing' comes from the whole of the human, technological and natural resources of the societies that accept it. It has no other backing.

If society breaks down, or beyond the borders of the society that accepts it, the money created by and for that society is worthless.

While coins and notes were once our entire pool of money, today they are just a fraction.

Most money is now recorded in electronic form as bits and bytes in banks' computers. The token has in effect become an eToken. We only see it the form of numbers on a bank deposit account statement; sometimes in paper form, often only on a computer screen. While such records are for all practical purposes 'money', legally they are not. Only coins and notes are 'legal tender'. This is a significant issue that is central to the problem of, and proposed solution to, Moral Hazard.

The ideal token has a number of attributes. Apart from having no intrinsic value of its own, it should also be immune from counterfeiting, theft and loss, as well as accidental or unlawful destruction.

It should also be easily divisible into any number of standard units and available for use anywhere in the world that it is needed.

Another key requirement is that the number of new *units* of money created should only be sufficient to: a) replace money that is lawfully destroyed, b) to facilitate additional transactions in a growing economy, or c) to boost an economy that is in recession. Not more or less. Less restricts trade; more just pushes up prices. Again, how to keep the money supply in balance is a whole other topic.

The material and form of the token is also irrelevant, except to the extent it meets the criteria.

eTokens can be developed to exhibit all of the ideal attributes of the perfect money token. Being electronic, the units can be created for almost nothing and transported at little cost anywhere they are needed in the modern world. They can also be divided into any number of units. Importantly, they can also be made so counterfeiting, theft, loss, and accidental and unlawful destruction is virtually impossible. This can be done by recording the money in

electronic Registers (bank accounts) and in eWallets (that could be a smart device) protected by three factor security. Nothing can be taken out of the account without the eWallet. Losing the eWallet does not mean losing the money. You just have to go through the hassle of replacing the eWallet and re-instating its connection to the eRegister. With the eRegister held by the Central Bank, loss of the money would become virtually impossible.

As indicated in the title, eMoney (digital currency) is central to how we may eliminate Moral Hazard.

But to understand the practicality, we need to understand for what purposes and how money is now created and destroyed.

5.5 Creation and Destruction of Money

5.5.1 Historical Context

Unfortunately, no one knows for sure how money evolved.

Piecing together many stands, it seems money may have been first created and issued 'out of thin air' by kings in the form of 'tokens' (tablets, coins, etc). These had marks or numbers inscribed on their face (their 'face value') that showed 'standard units of account'. They were issued to recognise the 'work performed' by the king's household and army - with higher ranks being paid more units. The tokens enabled the payees to redeem *goods of specified value* from the quartermaster's store with improved control (eg one unit for a hen, two for a lamb, etc). These exchange rates were set under the king's command, establishing the value of the tokens.

In time, the use of these 'units of account' (money tokens) spread to other subjects who accepted them in exchange, knowing that, if no one else accepted the money, they could get value from the king's store.

It was this trust that allowed the use of the money to extend throughout the kingdom.

Then, by agreeing to accept the money in payment of taxes, instead of needing to collect and distribute goods in kind, the king simply paid his courtiers and soldiers with tokens (money) who used them to buy goods off his subjects, who then paid their taxes with them – saving a huge amount of effort… brilliant!

5.5.2 Current

Money can be created and issued:

1) *as a loan*, with an obligation to give back value through future work and/or investment
2) *in exchange* for work performed, goods supplied or securities issued.
3) *equally to all* - to boost demand in a recession.

Today, it is the government that issues most money; with our trust now placed in the whole community to honour the tokens for value in goods and services.

However, instead of being issued for 'work performed' (as originally was the case), all new money is now issued *only* as debt - except for Quantitative Easing (QE) which is issued for securities.

No country now issues it 'for work done', nor 'equally to all its citizens, debt free'. But any country could.

Money flows up, much faster than it trickles down.

In the GFC, printing money to buy securities (QE), just boosted the price of securities, with little flowing down to 'main street'. Instead, in times of recession, the Central Bank could issue a gradually increasing weekly amount to every citizen (rich and poor), until full employment was restored. Most people would spend the new money to meet their daily needs, increasing demand and boosting business activity. This money would never have to be repaid. It would simply represent a permanent increase in the money supply, reflecting the increased activity. The lift in real activity would also boost share prices in a good way... because of increased profits. How this can be done without detriment to the labour market, or increasing inflation, is also the topic for another day.

Another topic is how new money could be issued for work performed that is highly valuable, but is not now paid because the benefits accrue to society and not to the person paying.

The three principle ways money is now created are:

5.5.2.1 Quantitative Easing

QE is the most recent way. It involves Central Banks buying existing securities from banks and other organizations using money created out of thin air. As this is a recent 'aberration', and is not the usual way money is created, I don't propose considering it in any more detail. Except to note that *the issue of the new money does not change the net wealth of the person to whom it is issued.* They simply exchange securities of a certain value for money of the same value.

QE effectively turned 'legal tender' into 'at risk deposits'. This proposal extends the process and turns the deposits back into legal tender. It would eliminate the need

for QE, as there would no longer be any need to 'rescue' banks, or provide liquidity, since deposits would no longer be at risk.

As suggested above, there are also better ways to inflate economies than using QE.

5.5.2.2 Local Exchange Trading Schemes (LETS) and BarterCard style Schemes

In these schemes, groups of people use a 'central registry' to create their own currency and use it to buy goods and services off each other. While there are newer digital versions that warrant consideration, they have little bearing on most trade in developed countries. For that reason I don't intend discussing them in detail.

However, it is important to note that, as with QE, *the net wealth of the parties to the exchange does not change*. LETS and BarterCard issue new 'currency' only in exchange for goods and services, with the person receiving them (the buyer) incurring an obligation to give back equal value - by providing goods or services of their own to the LETS/BarterCard community.

In essence, the person acquiring the goods or services incurs a debt to give back to the community in equal measure, while the seller, having given value, is entitled to take the same amount out.

The value of the transaction is recorded in a public ledger so everyone can see who is owed goods and services (to what amount), and who is in debt to provide goods and services (again, to the amount specified in the ledger).

LETS and their ilk fall short when dealing in broader markets, while the public nature of the register also raises concerns with some people.

Nevertheless, they are great for boosting activity by monetising small scale transactions between members of a local community.

5.5.2.3 Bank Lending Creates most New Money

Bank Lending goes to the heart of the issue of 'Moral Hazard' in Banking, so we need to look at it in some detail.

Importantly, the *new money that banks create has no impact on their own net worth.*

A Bank's Liabilities (Deposits) go up at the same time as their Assets (Loans). It is as simple as making two simultaneous entries in the books of the bank: Debit Loan to Borrower $100 (Asset) while Credit Deposit account in the name of the same

Borrower $100 (Liability). The Loan records the Borrowers debt, while the Deposit provides the avenue to draw down the Loan... to get cash out. See Bank of England paper for details.

As Cash is withdrawn, the Deposit is reduced by the same amount… *leaving the Bank's net worth unchanged.*

Nor does the net worth of the Borrower change when the money is borrowed. They get the Cash (asset), but also a debt to repay the Loan (liability).

When the borrower spends the proceeds of the loan, they hand it over to the seller in recognition of the value given. Again*, the net worth of the buyer and seller is unchanged by the exchange.*

This is the essence of money as the 'Medium of Exchange'*. It does not of itself change your wealth.*

Money only *records* value. This may be the value that you (or your benefactors) have created through work and/or investment... and not yet consumed. Or it may be money that you have borrowed and must repay.

As the loan is repaid to the bank, the entries are reversed. The money that is repaid goes back into the thin air from which it came. Once again, *the repayment has no effect on the net worth of the bank or the borrower*.

The bank only gets to keep the interest and fees paid. Most of this money is paid out as interest on borrowings (deposits) and operating costs (including salaries). It also goes to pay a 'risk premium' to cover normal defaults. The only part the bank gets is the *after-tax* profit... which goes to shareholders. In many cases, these are big insurers and pension funds representing the interests of the wider community.

The banks earn this profit for providing a service to the community. They allow people to get access to new money, not as a 'gift', but as a loan. The person borrowing the money has done nothing for it, yet it gives them the power to consume resources. By requiring repayment, we force the borrower to contribute their labour and resources to create future value, out of which the debt is repaid. In the end, they are required to put back in what they take out. This service has to be managed, which costs resources. If we did not have banks to lend new money, we'd need another organization with similar prudential controls.

5.5.3 Destruction of Money

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Money is lawfully destroyed every day as loans are repaid. The total money supply none-the-less increases, as the total of new loans exceeds repayments. This is necessary to fund growth under the current system (where all new money is created only as debt).

The same would remain true under the proposed system. As loans are repaid, the money (adjusted for inflation) would be written back into the air from which it came.

If general inflation was to become excessive due to too much money being pumped into the economy, besides levying a targeted charge on new borrowings (as previously discussed), the Central Bank could also levy a broad-based GST on all transactions (not just borrowings) to damp total demand. In all cases, the money re-couped would not go to the institution collecting the tax, nor to the Central Bank. It would be written back into the thin air from which it came… to take pressure off prices.

Again, this is a topic for another day.

6.0 Conclusion

Banks provide extremely valuable services: they ensure people who borrow new money repay it; and they run the payments system.

We may not like banks because of some corrupt practices, but that is as much as system problem, as it is a personal failing of the officers involved. A problem that this paper seeks to redress.

Banks earn their after-tax profits, not from creating money, but for providing on-going lending and payments services for the community.

The trouble is the way the system is now structured; it creates moral hazard - leading to unsound lending practices that imperil the system, and ultimately the whole society.

By passing a few simple new laws to:

1. Take both loans and deposits off the balance sheets of banks, and put them into Registers managed by the banks
2. Declare the Registered Deposits to be Legal Tender, and
3. Remove Guarantees and Insurance from Deposits that remain on Balance Sheet…

We can turn Deposits into Digital Currency (eMoney) that cannot be counterfeited, lost or unlawfully destroyed, eliminating Moral Hazard – greatly reducing the likelihood of imprudent lending and corrupt practices within the Banking sector.

With a stable banking sector and stable borrowing costs, the whole economy can be stabilised.

Transition to the new system can be phased over several years in a way that is non-threatening to existing banks. We don't even need to amend existing legislation (except to remove deposit guarantees and insurance). We only have to introduce new simplified legislation to create the new institutions (Bank Loan and Deposit Registrars)… a much easier task. The legislation could be extended to Credit Unions and Building Societies.

The only losers would be the few bank employees intent on using corrupt practices for their own benefit. The vast majority of bank employees, and everyone else in society, would be winners by a huge margin.

7.0 Emerging Digital Currencies: The Good and the Bad

7.1 Essence of Money

To understand why some digital currencies are 'good' and others 'bad' it is important to recognise that (as earlier illustrated), *Money does not of itself change your wealth* – not when it is created, nor when it is used. It exists primarily as a medium of exchange and secondarily as a vote for what gets produced.

7.2 Bank Created Money

As previously discussed, banks create new money through lending. However, *the new money they create has no impact on their own net worth. Not when the loans are issued, nor when they are repaid.*

Once you repay a bank loan, through doing work or investing (squaring your debt with society), both the deposit and the loan is extinguished… and the money destroyed.

7.3 Digital LETS

Some new digital currencies look promising as a tool for improving 'local activity'. They operate like traditional money. The 'units of account' are created electronically by a third party (the registrar), that acts a bit like a central bank. It involves making two records:

1. the value of work done, or goods supplied, by a member of the community - giving them a *right* to take out of the same community a similar amount of value in specified 'units'.

2. the same amount as an *obligation* by the person for whom the work was done, or to whom goods have been supplied. The obligation is to work or provide goods to other members of the community, to pay off the debt.

The LETS units exist only to recognise value given in an exchange. They disappear (off the register) once the value is returned in kind.

In this regard, they are like new money issued via bank loans and deposits.

Bitcoin is completely different.

7.4 Why Bitcoin (and similar digital currencies) are a really Bad Idea

7.4.1 Bitcoin as a Medium of Exchange

As a 'medium for exchange', Bitcoin's 'messaging approach' has a lot going for it. It allows for secure transactions between parties who are unknown to each other.

Though there are negatives. Exchanges have collapsed and wallets holding coins have been lost -costing hundreds of millions of dollars in lost value. And, once made, the transactions cannot be reversed. The system also consumes a huge amount of computing resources and electricity (currently around 1.46 terawatt-h per year) – just to make the coins.

Significantly, bitcoin also fails a key test of money: that it should have a fixed 'unit of account'.

The sole purpose of money is to record the value of a transaction. It allows the person receiving the money, to later acquire other resources of equal value (not more or less).

When you are paid in dollars (with a fixed face value), you are clear what you are getting. You can readily account your profit and loss.

Given its huge swings in valuation (14.5% drop in just the last few weeks), with Bitcoin this is impossible.

But that is the least worry.

7.4.2 Creation of Money by Bitcoin Miners

Bitcoin miners who spend money on electricity 'making' bitcoins are like counterfeiters who spend on paper, ink, presses and labour, to make and distribute their dollar notes.

The problem is not in the creation of the tokens per se - whether they are 'paper' (dollar notes), or 'electronic' (bitcoins). The problem is that both counterfeiters and bitcoin miners *create claims on society's resources they have not earned*.

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When a counterfeiter prints notes, *their net worth goes up immediately by the 'market value' of the notes* - assuming they can get people to accept them. And, just the same…

When a Bitcoin miner creates Bitcoins, *their net worth goes up immediately by the 'market value of the coins'* - assuming they can get people to accept them.

Unlike counterfeiters, the *net worth of Bitcoin miners could go on increasing by many orders of magnitude for many years*… making the fraud orders of magnitude worse. Here's how.

There are currently around 14 million coins 'on issue', with 25 new coins being produced every ten minutes. The rate is designed to halve every 4 years to 2140. At the end of that time a total of 21 million coins will have been produced.

The coin's current value is around $330, giving a total value of around $4.6 billion. This is a drop in the ocean of money ($500 trillion globally). But this is only the start.

Even now, to be of any use in transactions, the coins must be split into units, equivalent to dollars and cents, to buy goods and services. Ultimately, each coin can be split into 100,000,000 units. If bitcoins were to become recognised currency, the demand could quickly grow to a point where each unit would be worth a cent (the minimum value for transactions)... turning the whole supply into $14 trillion and counting, up to $21 trillion in 2140.

Not such a small amount.

Bitcoiners can accelerate this process by doing three things: 1) restricting circulation, 2) promoting its use, and 3) working to get it legalised as virtual currency.... so people will trust it.

As it appears more and more likely that the coins will be legitimized, the value of each coin will quickly grow, with increased demand from speculators. This will also result in a higher and higher value for smaller and smaller units.

As each unit approaches 1 cent, the value will likely stabilise, allowing people to use it as a 'unit of account' for exchange.

At this point, Bitcoiners only have to spend or sell the coins they hold at a rate that doesn't create a massive drop in value due to 'over-supply' - to realise the full effect of their fraud.

Given the claimed advantages in the *use* of Bitcoins, if they are legitimized, it is conceivable that many people may be happy to buy the coins at a cent per unit, not as an investment or for speculation, but simply for use as a 'medium of exchange'.

For simply running a bit of code, those who mine, hold and judiciously spend or sell the coins into the economy (*entirely for their own benefit*), can push the value of their coins to $1 million each. That is the fraud. It is better than any counterfeiter could ever hope for.

7.4.3 The Solution

The solution is to outlaw the creation and acceptance of bitcoins (and their ilk), just as we outlaw counterfeiting. Of course, we cannot stop it. And we may push it underground. But it is already used for criminal purposes. What we want is to de-legitimise it - so the rest of society does not get duped into handing over $trillions of resources for nothing.

As outlined in this paper, there are ways to create a genuine digital currency that not only avoids the problems of Bitcoin, but also stabilises the banking system by eliminating 'moral hazard'.

How Digital Currencies can Eliminate Moral Hazard in Banking and Stabilise the Financial System

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