

Hanley, Brian P.

**Working Paper**

## Release of the kraken: a novel money multiplier equation's debut in 21st century banking

Economics Discussion Papers, No. 2011-8

**Provided in Cooperation with:**

Kiel Institute for the World Economy – Leibniz Center for Research on Global Economic Challenges

*Suggested Citation:* Hanley, Brian P. (2011) : Release of the kraken: a novel money multiplier equation's debut in 21st century banking, Economics Discussion Papers, No. 2011-8, Kiel Institute for the World Economy (IfW), Kiel

This Version is available at:

<https://hdl.handle.net/10419/45183>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



<http://creativecommons.org/licenses/by-nc/2.0/de/deed.en>

## **Release of the Kraken: A Novel Money Multiplier Equation's Debut in 21st Century Banking**

*Brian P. Hanley*

*Butterfly Sciences, California*

**Abstract** Use of a promise to pay by a bank to insure an outstanding loan in order to return the value of the insured amount into capital for use in writing a new loan is an invention in banking with calculably greater potential economic impact than the original invention of reserve banking. The consequence of this lending invention is to render the existing money multiplier equations of reserve banking obsolete whenever it is used. The equations describing this multiplier do not converge. Each set of parameters for reserve percentage, nesting depth, etc. creates a unique logarithmic curve rather than approaching a limit. Thus it is necessary to show behavior of this new equation by numerical methods. It is shown that remarkable multipliers occur and early nesting iterations can raise the multiplier into the thousands. This money creation innovation has the demonstrated capacity to impact nations. Understanding this new multiplier is necessary for economic analyses of the GFC.

**JEL** E20, E51, E17, H56, H63

**Keywords** GFC; CDS; AIG; money multiplier; banking multiplier

**Correspondence** Brian Paul Hanley, Butterfly Sciences, 205 El Cajon, 95616 Country, California, USA; e-mail: [brian.hanley@ieee.org](mailto:brian.hanley@ieee.org)

# 1 Introduction

An invention in banking with calculably greater economic impact than the invention of reserve banking itself has appeared. It uses promise to pay (PTP) notes on outstanding loans as new capital for banking, sometimes referred to as regulatory capital relief ( Sjostrom, W. K. 2009: 943). I will show how it radically changes the money multiplier calculations that have been the foundation of reserve banking for hundreds of years. The development of the Kraken money multiplier is shown in equations 3 through 5, culminating with equation 5. Since equation 5 is not reducible, tables 1-4 show numerical results for multipliers with different parameters and depth of nesting. Figure 3 plots curves for tables 3 and 4 on a semi-log graph.

## ***Money-lending***

Money-lending is the oldest financing transaction involving money. It is derived from physical symbols of money in earliest times, where money was made of metal coins, rare shells, and other materials. In this transaction, a party, let us call her Jane, loans money to another party, whom we will call Jack. When Jane loans money to Jack she no longer has the physical money she loaned out, Jack has it. The hope is that Jack will pay Jane her principal back, together with interest. Sometimes Jack may have trouble paying Jane back. To compensate for the risk on her outstanding portfolio of loans, Jane needs to charge high interest. This requirement for high interest raises the risk that loans will not be paid back. High interest also puts limits on the viability of enterprises within an economy dependent on money-lending. In this system, there is no new money creation by lending.

## ***Reserve banking***

Reserve banking is perhaps the most remarkable invention in history. By making loans, banks create newly invented money that is itself deposited into the banking system, and from such new deposits new loans are in turn made. Thus, it placed into private hands the ability to create money by placing a present value on estimates of future ability to pay. Those private estimates of ability to pay made by bankers have generally proven quite good, with the exception of bubbles that occur irregularly due to “the madness of crowds” ( Mackay, C. 2001), referred to in recent years as “irrational exuberance”.

Banking evolved from enterprises with the ability to store physical currency safely that enabled money transfers without actually carrying the currency symbol from place to place. These became systems that loaned part of the recorded value of vault storage, over time loaning greater and greater fractions of such deposits held in trust, giving some payment to depositors for use of their money. From these roots was developed our fairly well regulated reserve banking system.

In the modern world, a bank operates based on core capital categorized as tier 1 and tier 2 ( "BIS-Basel II" 2006). In this tier 1 and 2 capital is the money invested by stockholders or other investors along with other instruments. Net earnings from the difference between the interest paid to depositors (or borrowed from another institution) and the interest paid by borrowers is accounted as primary profits for investors in the bank. Tier 1 and 2 capital usually is greater than or equal to capital reserve requirements and is supposed to be secondary in position to the needs of demand depositors. A bank generally loans more money than it has in deposits by maintaining sufficient tier 1 and 2 capital as reserves and thus optimizes profits.

A side effect of modern banking is that it makes it possible for banks to charge what we now consider reasonable interest rates while being more profitable than money-lenders are and

carrying lower overall risk. This is due to the difference between the borrower’s loan repayment income streams relative to core investor capital and the income of the simple system of money-lending. In banking, overall risk is lowered dramatically vis-à-vis money-lending both because lower interest rates are less likely to precipitate default and because a much larger pool of borrowers exists relative to invested capital.

**Money multiplier in reserve banking**

The standard formula for the banking money multiplier,  $m$  is:

$$m = \frac{1}{R} \tag{1}$$

where  $R$  = capital reserve fraction

The primitive equation is below. At the limit, it renders to the simple one above.

$$m = \sum_{i=1}^n (1 - R)^i \tag{2}$$

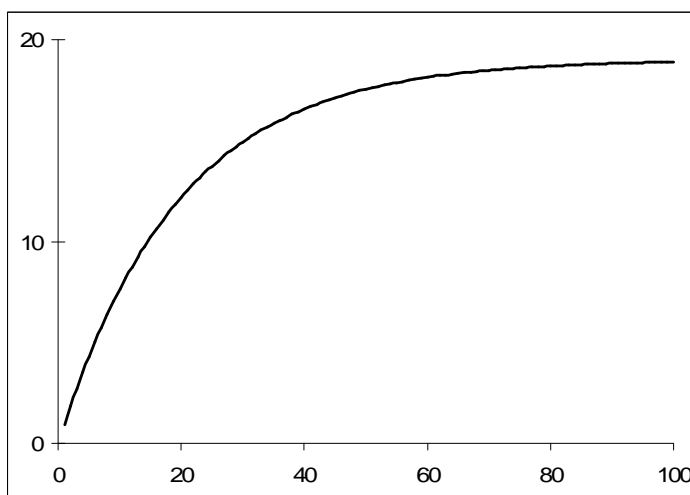
where  $R$  = capital reserve fraction

$i$  = iteration number on loans/deposits

$n$  = iteration limit

This equation has an asymptote at equation 1.

In figure 1 is a curve relating the number of iterations of equation 2 with the multiplier achieved for that iteration. In a hypothetical system, if it takes 30 days to approve each loan after acquiring new capital, then in one year 12 iterations are possible in that system. However, the number of iterations of loans for a real world banking system is variable with regard to time and this 30 day hypothetical system is simply a model system.



**Figure 1 – Iteration (x axis) versus multiplier (y axis) for a 5% reserve banking system.**

In the real world, a bank's lending is dependent on both capital availability and borrower creditworthiness which are both dependent on factors far beyond the scope of this discussion. The iteration period could be short if a backlog of approved borrowers is present, making the multiplier high in a short time period. Conversely, if a bank lacks creditworthy borrowers then there is no multiplier at all. So, in the real world, the multiplier can be extremely variable versus time; there is no rule that adding X amount of capital to banks will result in Y amount of new money created in any fixed time period.

In addition, in the real world, money is also taken out as circulating cash, loan losses, etc. so the true multiplier is always less than the theoretical values given by equation 1 or 2. Similar considerations apply to the equations developed below to describe the multiplier that will be described.

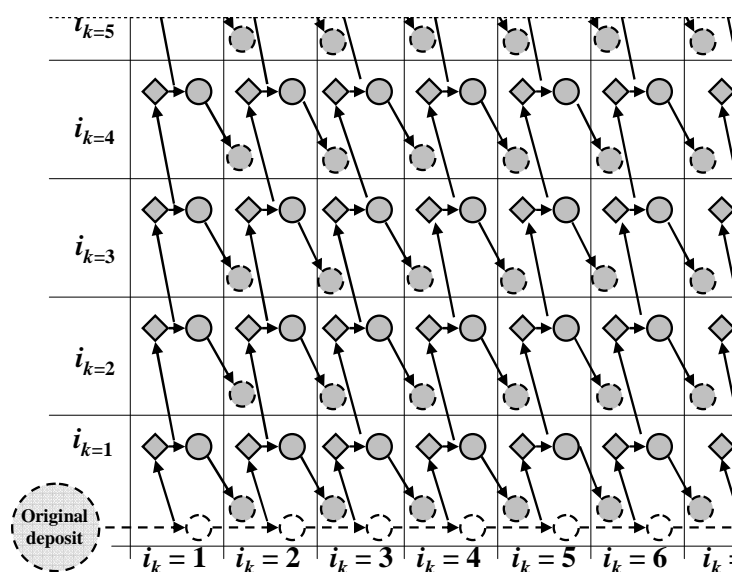
## 2 Kraken equation development

Much recent attention in banking centers on what can be allowed on the books as capital for reserve purposes and capital reserve levels. For instance, capital raised by use of trust-preferred securities has been a bone of contention for regulators as is reflected in legislation( "Dodd-Frank" 2010: 66). Some banks have gotten unusually low reserve requirements approved in the recent past leading to regulators demanding increases in reserve ratios( Hawken, K., et al. 2009: 49-53). In those discussions, the fundamental principle of the money multiplier in banking is not considered at risk. However, there is a class of capital for which the standard money multiplier formula fails. To calculate it for this class requires a new multiplier equation be constructed from the bottom up.

This novel invention of banking is based on the concept of acquiring a promise to pay (PTP) for an outstanding loan provided by a bank. The PTP guarantees to the bank that the loan will be paid off should the borrower go into default. In the most recent scenarios, these were provided by credit default swaps (CDS's) provided primarily by AIG on real estate loans. The bank pays a premium (nominally 1% to 5%) and receives in return a PTP for a loan that has been issued. On the basis of the PTP received, the bank puts the value of the PTP (or some major fraction thereof) into its capital account and can then write a new loan. This is described by equation 3.

A PTP would be paid over time. The nominal cost is based on a reported 5 year term for the CDS with quarterly payments of 0.5%. Very low premiums were reported as AIG's CDS business increased. In essence this created the opportunity to rent capital that could in principle be rolled over more or less indefinitely. (However a higher cost of 5% over a 5 year term was used in calculations for conservatism.)

In this new scenario described by equation 3, not only does each loan become new capital when it is deposited into the banking system by the borrower, but in addition, each PTP becomes brand new capital for the bank that holds the loan. Then, the brand new capital becomes the basis for a new loan and, that loan from the PTP capital becomes a new deposit of capital. In turn, each of those new deposits of capital becomes the potential basis for a new loan until the fractional capital available peters out. As shown in figure 2, in this new scenario money multiplies more than geometrically. It is completely different than the simple assumptions underlying Equation 2. Mathematically this is very interesting. It is a nested summation that can show hyper-exponential behavior depending on parameters (for equations 3 - 5).



**Figure 2 - New capital creation schematic for equations 3 - 5.**

Dashed arrows and dashed circles represent money creation in the normal reserve banking system. Horizontal dashed arrows are the first  $(1 - R)^i$  sub-term of equations 3-5. Dashed circles are new loans which become new capital deposits in the standard manner. Solid upward diagonal lines are the  $(1 - I)$  sub-term for acquisition of a promise to pay (PTP) based on each loan. These are the  $(O - I)$  term in equations 4 and 5. Solid gray-filled diamonds are the new capital created by each promise to pay acquisition. Solid horizontal arrows from diamond to circle are the second  $(1-R)^i$  sub-term. Solid gray-filled circles are new loans made which become new capital deposits. Downward diagonal arrows are the first new  $(1 - R)^i$  sub-terms. Dashed gray-filled circles are new loans made from new loan deposits in the conventional way, each of which anchors a new schematic identical with this one as an “original deposit”. However, for diagrams past the first layer shown here, the dashed circle amounts of the first line are no longer part of the conventional banking multiplier system.

$$m = \sum_{i_1=1}^n ((1-R)^{i_1} + ((1-R)^{i_1})(1-I) \cdot \sum_{i_2=1}^n ((1-R)^{i_2} + ((1-R)^{i_2})(1-I) \cdot \sum_{i_{k..}=1}^n ((1-R)^{i_{k..}} + ((1-R)^{i_{k..}})(1-I) \dots)))) \quad (3)$$

Where:  $R$  = deposit reserve fraction,  
 $i_1, i_2, i_{k..}$  = iteration number on loans/deposits,  $k$  being the series end term  
 $n$  = iteration limit  
 $I$  = insurance price

There are several new things in equation 3 compared to equation 2. There is the second sub-term adding a new loan. Within this sub-term, are  $I$ , the price of the PTP insurance policy and its companion term for allocating a new loan from new capital. And there are the series iteration

summation terms that are multiplied in nested manner. The equation is remarkable; it is a nested multiplicative series of summations. When historical values are plugged in of  $R = 5\%$  and  $I = 5\%$  we get very interesting numbers, as will be seen.

Restated, for each loan made, a PTP is acquired. This PTP is used to declare that the loan amount minus the cost of the PTP is new capital. Each PTP is then used to originate a new loan, which loan gives rise to more PTP capital, etc.

Examining equation 3, it becomes apparent that an assumption with possible impact on its behavior may not be entirely correct. In equation 3, the cost of  $I$  is subtracted from 1, which assumes the starting point is the value of the loan being insured with a PTP. However, banks charge origination fees (points) to borrowers. If all or part of the cost of  $I$  is paid for by such fees, then the subterm  $(1 - I)$  becomes  $(O - I)$  where  $O$  is loan plus origination fees and greater than or equal to 1. If it is possible to charge more in fees to originate the loan than the cost of  $I$ , then the same subterm can even evaluate to greater than 1. This generates more interesting behavior.

$$m = \sum_{i_1=1}^n ((1-R)^{i_1} + ((1-R)^{i_1}(O-I) \cdot \sum_{i_2=1}^n ((1-R)^{i_2} + ((1-R)^{i_2}(O-I) \cdot \sum_{i_{k..}=1}^n ((1-R)^{i_{k..}} + ((1-R)^{i_{k..}}(O-I) \dots)))))) \quad (4)$$

Where:  $R$  = deposit reserve fraction,

$i_1, i_2, i_{k..}$  = iteration number on loans/deposits,  $k$  being the series end term

$n$  = iteration limit,  $I$  = insurance price

$O = 1 +$  origination fee fraction of loan (generally charged as “points”)

As origination fees of 5 points are about as high as such fees go and 5% origination fees are reasonable to view as limits under normal circumstances.

In examining how PTP financing was actually conducted, a final parameter becomes visible, which is  $T$ , the tranche fraction for a portfolio of ventures for which a PTP is obtained. This results in equation 5 shown below. In Tables 1-4 is graphically shown how multipliers grow with nesting of equation 5 up to 10 levels deep for a realistic insurable tranche fraction of 30%.

$$m = \sum_{i_1=1}^n ((1-R)^{i_1} + (((1-R)^{i_1}(O-I) \cdot T) \cdot \sum_{i_2=1}^n ((1-R)^{i_2} + (((1-R)^{i_2}(O-I) \cdot T) \cdot \sum_{i_{k..}=1}^n ((1-R)^{i_{k..}} + (((1-R)^{i_{k..}}(O-I) \cdot T) \dots)))))) \quad (5)$$

Where:  $R$  = deposit reserve fraction,

$i_1, i_2, i_{k..}$  = iteration number on loans/deposits,  $k$  being the series end term

$n$  = iteration limit,  $I$  = insurance price

$O = 1 +$  origination fee fraction of loan (generally charged as “points”)

$T$  = tranche fraction insured.

It is instructive to see what happens using equation 5 when  $T = 0.30$ ,  $O = 1$ ,  $I = 5\%$ ,  $n = 100$ , and  $k$  increments from 1 to 10 (e.g. a maximum of 10 levels of nested iterations) with different values of  $R$ . These are shown in tables 1 and 2 below.

$k$	$m$ , where $T=0.30$ $O=1$ , $R = 0.05$
1	24
2	150
3	824
4	4,453
5	23,992
6	129,164
7	695,302
8	3,742,788
9	20,147,225
10	108,451,327

$k$	$m$ , where $T=0.30$ $O=1$ , $R = 0.025$
1	46
2	508
3	5,232
4	53,565
5	548,064
6	5,607,368
7	57,369,941
8	586,961,390
9	6,005,299,050
10	61,441,207,420

#### Tables 1 and 2

A sample of multipliers for values of  $k$  from 1 to 10 are presented. The tables show values of  $m$ , when  $n = 100$ ,  $O = 1.0$ ,  $I = 5\%$ ,  $T = 30\%$  for  $R = 5\%$  and  $R = 2.5\%$ . Numerical methods used because equations do not converge and are not reducible.

It is further instructive to see what happens using equation 5 for the same cases as tables 1 and 2 when  $O = 1.05$  to account for fee level of 5 points on origination of the loans as shown in tables 3 and 4 and in figure 3.

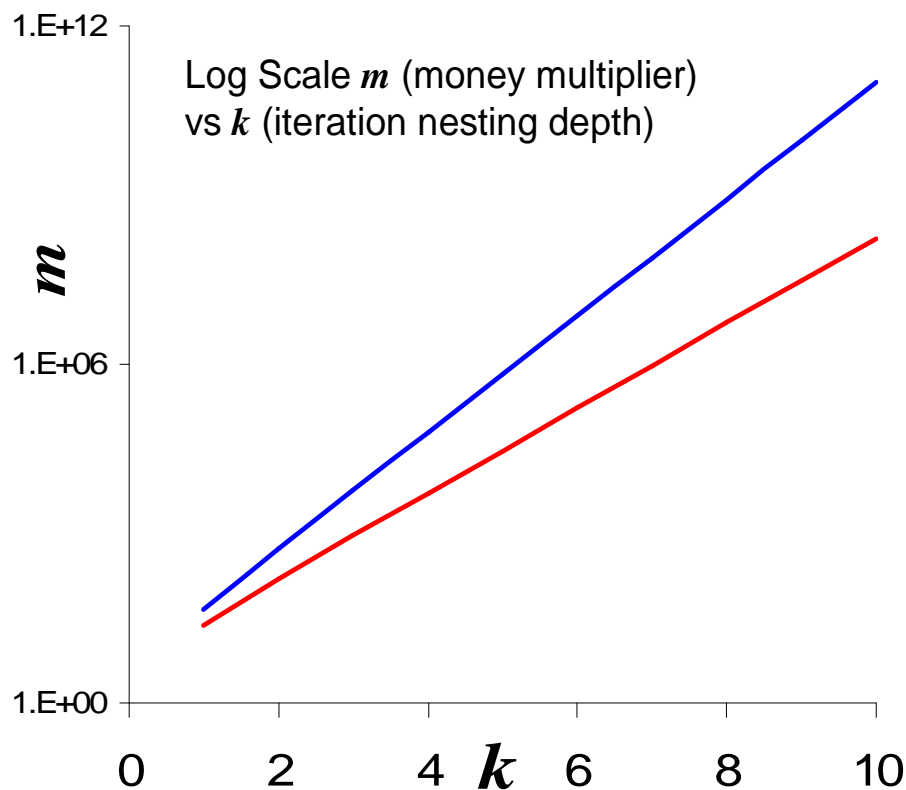
$k$	$m$ , where $T=0.30$ $O=1.05$ , $R = 0.05$
1	24
2	158
3	914
4	5,199
5	29,479
6	167,054
7	946,589
8	5,363,637
9	30,391,743
10	172,207,323

$k$	$m$ , where $T=0.30$ $O=1.05$ , $R = 0.025$
1	46
2	538
3	5,835
4	62,880
5	677,240
6	7,293,674
7	78,550,336
8	845,959,488
9	9,110,685,705
10	98,118,875,480

#### Tables 3 and 4

A sample of multipliers for values of  $k$  from 1 to 10 are presented. The tables shows values of  $m$ , for increasing  $k$ , when  $n = 100$ ,  $O = 1.05$ ,  $I = 5\%$ ,  $T = 30\%$  for  $R = 5\%$  and  $R = 2.5\%$ . Numerical methods used because equations do not converge and are not reducible.





**Figure 3 – Graph of money multiplier for reserves of 5% (red) and 2.5% (blue).**

Shows values of  $m$ , for  $k$  from 1 to 10, when  $n = 100$ ,  $O = 1.05$ ,  $I = 5\%$ ,  $T = 30\%$ .

(Red)  $R = 5\%$  (Blue)  $R = 2.5\%$ .

Each set of parameters will create a unique logarithmic curve rather than approach a limit. It is obvious from inspection of this figure that while the Kraken mechanism can be used to create money through credit without any internal limit, this mechanism must bump up against limits to its money creation present in the outside world.

The point of showing the numerical results in tables 1-4 and figure 3 is to make it clear that there is no reasonable limit to money creation using this mechanism that is inherent to its mathematics. Each set of parameters results in a unique logarithmic curve. Therefore it can, in theory, create billions of dollars for every original dollar. The only significant limitations are: A.) a bank's ability to acquire PTP contracts and if necessary maintain them by rollover; B.) to some degree limits due to regulatory tier 1 and 2 capital type restrictions where BIS standards are observed, which is discussed below; and C.) external limits on credit creation, also discussed below.

### 3 Discussion

CDS instruments have been around for decades. Most historical uses of credit default swaps (CDSs) have nothing to do with PTP capital creation, but with risk management ( Sjoström, W. K. 2009: 943). This discussion should not be construed as inherently critical of CDS instruments but of their utilization in this specific way where it is not conducted within a sound total system.

It is not clear that the Kraken multiplier mechanism is inherently problematic since in theory PTP financing should only be available for properly rated loan-backed securities. Consequently, in a regulated environment where security rating was properly attended to, and the economy needed the capacity to create large amounts of money in order to create new value, this new mechanism could have a perfectly valid place.

However, in practice, the short term rewards of the Kraken mechanism made by bypassing proper rating of securities irresistible to bankers ( Angelides, P., et al. 2011: xxv, 68, 118 & 165). Thus, a bubble appeared, running up prices in a speculative price-kiting-economy. The results were dramatic, and pondering this mechanism suggests that deliberate exploitation could prove catastrophic. Details of these aspects are discussed below.

#### *Creation of tier 1 and tier 2 capital versus creation of demand deposits*

Noting first that the definitions of capital categories are flexible, it will be observed that direct PTP capital would be defined as tier 1 up to the 15% rule per Basel II ( "BIS-Basel II" 2006), after which it would become tier 2 capital, and hence subject to tier 2 limitations. It does not appear that this rule has changed for Basel III ( "BIS-Basel III" 2010). Within the banking system as a whole, any loans created from such presumptive tier 1 or 2 capital will represent new demand deposits to the banking system and these would be in superior position to tier capital. Any secondary loans granted from the deposits using the standard money multiplier mechanism will also be demand deposits within the system as a whole. In theory, it is possible that demand deposits could be created so as to require retention of such monies to meet reserve requirements.

Examining equation 5, it can be seen that for each term, the subterm quantity representing the PTP capital for its corresponding loan is lower than the PTP itself by the amount of the retained reserve percentage. This can be used to yield an equation 6 which indicates that the ratio between logged PTP capital and new deposit creation from the mechanism itself.

$$r_{PTP} = \frac{1}{(O - I) \cdot T} \quad (6)$$

Where:  $r_{PTP}$  = ratio of PTP capital to new deposit creation

$I$  = insurance price

$O$  = 1 + origination fee fraction of loan (generally charged as "points")

$T$  = tranche fraction insured. (See equation 7.)

As long as the assumption is made that each new loan is in turn insured, there will be some limits to short term capital creation because  $r_{PTP}$  is greater than one, and so tiered capital limits will eventually be exceeded. Over longer time scales, circulation of created money could result in enlarging the pool of tier 1 and 2 investment capital. However, tiered capital only

becomes a limit if the bank does not increase its reserves through usual fiat money mechanisms. In a 5% reserve system  $r_{PTP}$  will be approximately 1.052 per transaction.

However, in cases in which some fraction of new loans are not insured the ratio drops below 1 as shown in equation 7.

$$r_{PTP} = \frac{1}{(O - I) + \sum_{i=s}^n (1 - R)^i} \quad (7)$$

Where:  $r_{PTP}$  = ratio of PTP capital to new deposit creation

$I$  = insurance price

$O$  = 1 + origination fee fraction of loan (generally charged as “points”)

$i$  = iteration number on loans/deposits

$s$  = iteration start,  $n$  = iteration limit for each loan not in turn PTP insured

In a simple example case of skipping one loan for PTP insurance, the ratio for that pair in a 5% reserve system would be approximately 0.54. Such a ratio would grow total deposits in the system at almost double the rate of the recording of PTP tier 1 or 2 capital. It could be theoretically possible that deposits could increase to a level such that demand deposit monies would be required to be retained to maintain capital reserve needs. In such a scenario, the limits on money creation would be unclear.

Of course, the banking system is not homogenous, but is composed of institutions that exhibit degrees of source and sink characteristics for any particular financial instrument. Consequently, should a limited number of institutions be generating new money by the PTP mechanism, that set of institutions will be limited in their money creation to the extent that new loan deposits leak from their institutional group. This leads to the conclusion that limits on creation of PTP originated money can vary greatly on a case by case basis. But it would appear likely that PTP capital creation would experience its first realistic limit in the crash which would generally follow an overexpansion of such capital based on any particular narrow asset class.

### ***Bailouts and the creation of a bubble***

The mechanism of equation 5 creates money as fast as the transactions can occur. It is a mechanism that generates money on a scale that would rapidly eclipse the previously created monetary wealth of the world if it were possible for it to operate unchecked for long.

“Too big to fail” bailouts, (of Long Term Capital Management, then of AIG and a host of banks) has privatized profit and left the public holding the bag for losses due to risk, thus undermining fundamental efficient market assumptions ( Hetzel, R. L. 1991: 3-15, Quiggin, J. 2010: 50-51). The mechanism of bubble creation relative to PTP banking is presumed to be that it encourages lenders to ignore credit risk ( Dickinson, E. 2008). This relies on failure of rating agencies to inform PTP sellers as well as failure of risk assessment by the sellers and these elements are present in the GFC ( Angelides, P., et al. 2011: xxv, 68, 118 & 165).

When an asset such as real estate turns over for an increased price, little or no new utility value is normally created. Creation of new utility value occurs if the home is built and sold for the first time where there is need for the housing, or to the extent it is improved commensurate with the price increase when turned over. Radical price increases for homes in the years just prior to the bubble were seen in the USA before the real estate bubble popped.

In an ideal model system, new capital would be accompanied by the creation of new value of goods and services commensurate with it, so the amount of money available to purchase does not rise dramatically while supply remains fixed (thus inflating price). Without commensurate increase in utility value of goods, increases in price due to excessive money supply creates a bubble and the market begins to resemble that for tulip bulb mania. So a PTP mechanism that exists only for a narrow sector would be expected to create a bubble by price inflation as the mechanism created more money in that sector. Thus, the mechanism of PTPs applied to real estate loans would be expected to create a bubble due to the massive amount of new money that can be created entirely focused on a narrow fixed asset class.

#### ***Lower reserves and raised fees in concert with use of the Kraken mechanism***

In table 1 we see that the hoary reserve multiple of equation 1 has increased by 20% from 20 to 24 at the first iteration ( $k = 1$ ) using equation 5. Looking at tables 1-4, we see that charging 5 points at the earliest iterations where  $k = 3$  nets multiplier differences that are hugely larger than equation 1 would yield. (e.g. table 3 has 914 and table 1 shows 824, for a multiplier difference of 90 times.)

The money multiplier results of tables 1 through 4 also show why equation 5 would motivate lower reserves in the context of equation 5. (e.g. for  $k = 3$ , table 4 shows 5,835 while table 5 shows 5,232, for a multiplier difference of 673 times.) In a system wherein “too big to fail” results in public guaranteeing large scale failures, when the music stops the biggest jackpot goes to those who hit the wall highest.

In the context of such high multipliers, larger fee totals for transactions are achievable though that aspect is not examined herein. Additionally, interest on the new loans that were based on PTP capital is another source of income, and interest rate differentials (also not examined here) can potentially compensate for ongoing PTP costs in order to maintain the contract that is insuring the PTP which is the basis of a specific loan.

#### ***External limits on money creation***

Creditworthy borrowers are a necessary component of banking or loan service will fail. Some fraction of loans will go into default in any banking system. The question is how large that fraction is and whether the rate of default is supportable. In the GFC, limits were exceeded when too many loans defaulted for real estate purchases ( Angelides, P., et al. 2011: xxv, 68, 118 & 165). It is clear from this that in the GFC, this money multiplier hit limits external to itself. That limits are present is also intuitively obvious. Such mechanisms cannot operate forever in the real world.

The modern economy may be primarily credit-driven, which correlates with the observation that fiat money creation lags credit creation, at least in boom times, contrary to the monetarist view ( Keen, S. 2009: 1-33). A related argument says that in times of contraction, fiat money introduced into the system will not get expanded by the banking multiplier because the system’s contraction is not a result of lack of fiat money in the first place ( Keen, S. 2009: 3-24). Since banks are allowed to back-fill their needs for fiat money as needed and institutions are reluctant to cause a credit crunch by refusing these requests, loan activity drags fiat money along to keep pace with private money creation. Thus, fiat money does not appear to have the “push” relationship to loan activity in the modern world. In boom times, the extension of credit is not limited by money supply even though the multiplier is still present as a mathematical relationship in banking.

That a push relationship to money creation does not exist also makes intuitive sense because it is obvious that provision of more money to loan can only result in a loan if there is

demand for loans from borrowers that banks consider good credit risks. Whether the evaluation of credit risk by banks, both positive and negative, is correct is another question. In this view, providing money to borrowers in some fashion is recommended to improve borrower creditworthiness.

The monetarist view has treated the GFC as a signal for heroic extension of money by the Federal Reserve in order to stimulate lending. In the monetarist view doing so provides the fuel to allow the banking system's multiplier to make credit available.

From both viewpoints, the existence of the Kraken multiplier for a segment of the economy is significant. In the monetarist view, it enables a far greater amount of credit to be created than would normally be thought possible under the currently understood money multiplier, with significant impacts on bailout requirements. In the credit demand driven view that eschews the push relationship on credit creation, it would be expected to raise the ratio of private debt to fiat money in unexpected ways.

Both views should see that this new multiplier applied to speculative (i.e. Ponzi price kiting) debt will fuel a greater capacity for "irrational exuberance". Both camps should realize that the existence of this new multiplier throws existing monitoring ideas into a cocked hat. Monitoring demand from banks if this new multiplier is operating cannot be a guide to credit extension activity as a rule of thumb when the Kraken is in play, and money ratios would be expected to change in ways hard to explain.

## 4 Concluding comments

The Kraken equation can provide banks that use it with an extreme advantage over other banks as long as the seller of promises to pay (PTPs) is able to cover liabilities or else have buyer liabilities guaranteed by the public to prevent the chaos a banking crash would cause. In the real world, using this method to create new lending capital when no commensurate creation of new utilitarian value can reasonably be expected is similar to a pyramid scheme in that it simply cannot go on forever. Although in theory brakes should be applied to availability of PTPs when rating agencies downgrade the ratings of underlying securities, in practice they were not.

This mechanism, generally, presents issues of significant interest to regulators and in some cases may justify loosening or tightening reserve requirements for specific banks.

There is no inherent theoretical reason why Kraken banking should not be acceptable as long as the underlying securities are sound in each case and everyone understands what is going on. It is conceivable that should an economy have valid needs for monetary expansion based on underlying productive fundamentals that the Kraken mechanism may be useful, perhaps even necessary, in order to provide an optimum amount of money within the economy. The advent of Kraken banking could prove to be positive by making availability of private money dependent on human ability to judge commercial prospects for value creation in the absence of the usual fiscal limitations inherent in the reserve banking system.

As fuel for speculative short term investing Kraken banking is clearly dangerous. Allowing its use by banks should be done with care toward the aspects of the economy it is fueling, as it has the ability to potentiate serious financial bubbles and there are overwhelming financial incentives to maximize short-term gain at public expense by using Kraken banking in a "too big to fail" financial system.

**Glossary of terms:**

**AIG** – American International Group corporation.

**BIS** – Bank for International Settlements.

**CDS** – Credit default swap.

**GFC** – Global financial crisis.

**Kraken** - The Kraken is a mythical beast from Scandinavian folklore with many tentacles that rises without warning from the depths of the ocean to drag ships to their doom. It has appeared (incorrectly) in movies as a creature of Zeus, god of Mount Olympus. In this usage it is metaphorical.

**PTP** – Promise to pay. A type of insurance that promises to pay the balance on a loan or investment should it fail. A generic term covering credit default swap (CDS).

**tranche** – When investments in a portfolio are grouped together, rules can be designed such that a part of the portfolio is paid off by different rules than other parts. For instance, a first tier tranche can be paid off before all others, second tier after the first, etc.. Each of these parts is a tranche and carries a different level of risk relative to the pool of investments. Typically, the risk level of a tranche is reflected in the interest rate paid.

## References

ANGELIDES, P., THOMAS, B., BORN, B., GEORGIU, B. S., GRAHAM, B., HENNESSEY, K., HOLTZ-EAKIN, D., MURREN, H. H., THOMPSON, J. W., WALLISON, P. J., EDELBERG, W., COHEN, G. J., SEEFER, C., FELDBERG, G., AHMED, S. I., ALLEN, H. J., ARMSTRONG, J. E., BACHMANN, R., BAKER, B., BALTAKE, S., BONDI, B. J., BOONE, S., BORGERS, T., BORZEKOWSKI, R., BRYAN, M., BUBB, R., BURRUS, T. A., CHENG, R. R., COLLINS, J. V., COOPER, M., CREGO, A., CUNICELLI, V. J., DANGANAN, J. G., DAVIDSON, S., REAL, E. A. D., DOWNEY, K., DUBAS, K., DUNCKER, D., DZIVI, B. A., EASTERLY, M. E., FALK, A., FASULES, M. L., FLAGG, M., SEAN J. FLYNN, J., GANZ, S. C., GREENE, T., HAGGERTY, M., HINKLEY, R. C., INGOGLIA, A. C., JACOBS, B., KAVOUNAS, P. A., KEEGAN, M., KEEGAN, T. J., KELLERMAN, B. L., KNAUS, S., KREBS, T. L., LERNER, J. N., LEWIN, J. E., MANDEL, S., MARCACCI, J. A., MAASRY, A., MAYO, C., MCCARDEN, C., MCWILLIAMS, B. G., MEDINA, M. L., MILLER, J., MINTZ, S. L., MORAIN, C., NATARAJAN, G., NEWSOM, G. K., NOONAN, D., NORMAN, D. K., PAUL, A. M., POULIN, J. D., ROBINSON, A. C., SANDERFORD, S., SCHULTE, R. T., SCOTT, L. J., SEABOLD, S., SHAFER, K. L., SHEMIN, G., SHROFF, S. C. P., SIMENDINGER, A., SIMHAI, M., SMITH, J., STANTON, T. H., STROEBEL, L. W., SYLVESTER, B. P., TANG, S., VAHDATI, F. Z., CORNEJO, A. A. V., VICKERS, M. Z., WAHL, G., WARREN, T., WASKOWICZ, C. D., ARTHUR E. WILMARTH, J., and ZUCKERMAN, S. (2011): *The Financial Crisis Inquiry Report: Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the United States - Submitted by The Financial Crisis Inquiry Commission Pursuant to Public Law 111-21*. Washington, D.C.: U.S. Government Printing Office.

- "Basel III: A global regulatory framework for more resilient banks and banking systems," (2010): Basel, Switzerland: Bank for International Settlements.  
<http://www.bis.org/publ/bcbs189.pdf>
- DICKINSON, E. (2008): "Credit Default Swaps: So Dear to Us, So Dangerous."  
<http://ssrn.com/abstract=1315535>
- "Dodd-Frank Wall Street Reform and Consumer Protection Act " (2010), 66.  
<http://thomas.loc.gov/cgi-bin/query/z?c111:H.R.4173>:
- HAWKEN, K., and BAKE, M. (2009): "Amendments to the Capital Requirements Directive adopted by European Parliament," *Journal of Investment Compliance*, 10, 49-53.  
<http://www.emeraldinsight.com/journals.htm?articleid=1811907>
- HETZEL, R. L. (1991): "Too big to fail : origins, consequences, and outlook," *Economic Review*, 77, 3-15.
- "International Convergence of Capital Measurement and Capital Standards," (2006): Basle, Switzerland: Bank for International Settlements.  
<http://www.bis.org/publ/bcbs128.pdf>
- KEEN, S. (2009): "Bailing out the Titanic with a Thimble," *Economic Analysis & Policy*, 39, 3-24.
- (2009): "The Roving Cavaliers of Credit," 1-33.  
<http://cdn.debtdeflation.com/blogs/wp-content/uploads/reports/KeenDebtwatchNo31February2009CavaliersOfCredit.pdf>
- MACKAY, C. (2001): *Extraordinary Popular Delusions and the Madness of Crowds*. Hertfordshire, UK: Wordsworth Editions, Ltd.
- QUIGGIN, J. (2010): "The Efficient Markets Hypothesis," in *Zombie Economics*. New Jersey; Woodstock, Oxfordshire: Princeton University Press, 50-51.
- SJOSTROM, W. K. (2009): "The AIG Bailout," *Washington and Lee Law Review*, 66, 943.  
<http://ssrn.com/abstract=1346552>

Please note:

You are most sincerely encouraged to participate in the open assessment of this discussion paper. You can do so by either recommending the paper or by posting your comments.

Please go to:

<http://www.economics-ejournal.org/economics/discussionpapers/2011-8>

The Editor