The Secretary Environment and Planning Committee
Parliament House, Spring Street
EAST MELBOURNE VIC 3002
epc@parliament.vic.gov.au

26-8-2016

SUBMISSION

Ref: 20160826-G. H. Schorel-Hlavka O.W.B. to The secretary Environment and Planning Committee - SUBMISSION, etc.

SUPPLEMENT 1

Sir/Madam,

Further to my 7-3-2016 submission I like to add the following as set out in my 25-8-2016 PRESS RELEASE that municipal/shire councils are charging 9.5% interest while the banks are criticised for not lowering their rates to 1/5%. In my view the 9.5% is a gigantic rip off and should be considered with any rate cap increase request by any council!

QUOTE 25-8-2016 PRESS RELEASE
Do as I say not as I do the hypocritical conduct by PM Malcolm Turnbull.

The documents can be downloaded from:

ISSUE - Interest (usury) by Government departments- its authorities & banks, etc & the constitution

As a CONSTITUTIONALIST my concern is the true meaning and application of the constitution.

Turnbull to banks: pass on whole interest rate cut - The Conversation
theconversation.com/turnbull-to-banks-pass-on-whole-interest-rate-cut-63455
Aug 3, 2016 - Malcolm Turnbull has sternly told the banks they should pass on the ... After the Reserve Bank cut the cash rate by 25 basis points to 1.5%, the ...

Malcolm Turnbull calls on bank bosses to pass on interest rate cut
www.smh.com.au › Business › News & Views › Banking
Aug 3, 2016 - A day after the Reserve Bank cut interest rates to the historic low of 1.50 per cent, Mr Turnbull said Australia’s official rates were higher than ...

Turnbull warns banks on rate cuts - ABC
www.abc.net.au/news/2016-08-03/banks-must-pass-on-interest.../7685644
Aug 2, 2016 - Prime Minister Malcolm Turnbull has urged banks to pass on ... The Reserve Bank cut the official interest rate to a new low of 1.5 per cent, ...

Victorian Municipal Councils such as Banyule city council and Buke Shire Council Are charging an interest rate of 9.5% on overdue payments. One has to ask are they charged
themselves 9.5% Fire Levy interest if they do not pay the full amount to the relevant Government Authority?
The ATO (Australian Taxation Office) applies a “fine” and charges a yearly rate of 9.01% compounding every day. This even so it is not borrowing any monies at 9.01% either.

*Commonwealth of Australia Constitution Act 1900 (UK)*

QUOTE

(xiii) banking, other than State banking; also State banking extending beyond the limits of the State concerned, the incorporation of banks, and the issue of paper money;

END QUOTE

While the constitution permits State Banking (ONLY if conducted within state boundaries) Victoria for example has no State Banks and as such I view cannot set any interest rate chargeable by municipal/shire Councils. It is a Commonwealth legislative power. However, Prime Minister Malcolm Turnbull I view is a hypocrite when lambasting the banks while the ATO charges a massive 9.01% daily compounding yearly interest rate which is absurdly high considering no monies are borrowed by the ATO for this, and moreover, it doesn’t pay 9.01% daily compounding interest to taxpayers on any refund, etc. For clarity I never have nor do now own any bank shares in my own name!

**This correspondence is not intended and neither must be perceived to state all issues/details.**

Awaiting your response,  G. H. Schorel-Hlavka O.W.B. (Gerrit)

MAY JUSTICE ALWAYS PREVAIL® *(Our name is our motto!)*

END QUOTE 25-8-2016 PRESS RELEASE

For example the ATO claimed to have fined me $1,700

Now lets see how a daily compounding interest of 9% percent amount to!

http://financialmentor.com/calculator/compound-interest-calculator

QUOTE

Beginning Account Balance:

Enter the **Daily** addition ($):

Annual Interest Rate (%):

Choose Your Compounding Interval:

Number of Years To Grow:

Future Value:

Total Deposits:

Interest Earned:

1000

0

9.01

Daily

1

$1,860.26

$1,700

$160.26

END QUOTE

http://financialmentor.com/calculator/compound-interest-calculator

QUOTE

Beginning Account Balance:

Enter the **Daily** addition ($):

Annual Interest Rate (%):

Choose Your Compounding Interval:

Number of Years To Grow:

Future Value:

Total Deposits:

Interest Earned:
As such the actual claimed interest by the ATO (as an example) is 9.43%.
One has to consider if any municipal/shire council applies such a scheme at all and if they could employ such a scheme by changing the yearly interest rate to a yearly daily compounding interest rate?

If the same daily compounding interest was applied with 2.5% then it would become:

http://financialmentor.com/calculator/compound-interest-calculator

Quote

Beginning Account Balance: 100
Enter the Daily addition ($): 0
Annual Interest Rate (%): 9.01
Choose Your Compounding Interval: Daily
Number of Years To Grow: 1
Future Value: $102.53
Total Deposits: $100
Interest Earned: $9.43

End Quote

Try the same on say $2000 rates bill:

http://financialmentor.com/calculator/compound-interest-calculator

Quote

Beginning Account Balance: 2000
Enter the Daily addition ($): 0
Annual Interest Rate (%): 2.5
Choose Your Compounding Interval: Daily
Number of Years To Grow: 1
Future Value: $2050.63
Total Deposits: $2000
Interest Earned: $50.63

End Quote

As such the actual claimed interest is compounded daily by the councils (as an example) would be 2.53%.

It is important that any rates applied must be to a strict formula and cannot be changed to daily or even Nano seconds, if some bright or ridiculous person may contemplate.

Again:

http://www.math.hawaii.edu/~ramsey/CompoundInterest.html

Quote (bolding and red colour added)
What if we are utterly greedy, and insist that the bank compound our interest continuously?

What happens if we make the compounding period a millionth of a second, and ever smaller? Does the amount of interest increase forever without bounds, or do we reach a ceiling (a limit!) as we compound more and more frequently?

END QUOTE

http://www.math.hawaii.edu/~ramsey/CompoundInterest.html

QUOTE

Bank deposits, over time, usually have **compound interest**. That is, interest is computed on an account such as a savings account or a checking account and the interest is added to the account. Because the interest is added to the account (the alternative would be to mail the interest to the customer), the interest itself earns interest during the next time period for computing interest. This is what is meant when it is said that the interest **compounds**. See Salas and Hille, page 448-449.

The time interval between the occasions at which interest is added to the account is called the **compounding period**. The chart below describes some of the common compounding periods:

<table>
<thead>
<tr>
<th>Compounding Period</th>
<th>Descriptive Adverb</th>
<th>Fraction of one year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 day</td>
<td>daily</td>
<td>1/365 (ignoring leap years, which have 366 days)</td>
</tr>
<tr>
<td>1 month</td>
<td>monthly</td>
<td>1/12</td>
</tr>
<tr>
<td>3 months</td>
<td>quarterly</td>
<td>1/4</td>
</tr>
<tr>
<td>6 months</td>
<td>semiannually</td>
<td>1/2</td>
</tr>
<tr>
<td>1 year</td>
<td>annually</td>
<td>1</td>
</tr>
</tbody>
</table>

The interest rate, together with the compounding period and the balance in the account, determines how much interest is added in each compounding period. The basic formula is this:

\[
\text{the interest to be added} = (\text{interest rate for one period}) \times (\text{balance at the beginning of the period})
\]

Generally, regardless of the compounding period, the interest rate is given as an **ANNUAL RATE** (sometimes called the **nominal rate**) labeled with an r. Here is how the **interest rate for one period** is computed from the nominal rate and the compounding period:

\[
\text{interest rate for one period} = (\text{nominal rate}) \times (\text{compounding period as a fraction of a year}) = (\text{nominal rate})/(\text{number of compounding periods in one year})
\]

If we put these two formulas together we get

\[
\text{the interest to be added} = (\text{nominal rate}) \times (\text{compounding period as a fraction of a year}) \times (\text{balance at the beginning of the compounding period})
\]
<table>
<thead>
<tr>
<th>Compounded</th>
<th>Calculation</th>
<th>Interest Rate For One Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily, each day, every 365th of a year</td>
<td>(.06)/365</td>
<td>0.000164384</td>
</tr>
<tr>
<td>Monthly, each month, every 12th of a year</td>
<td>(.06)/12</td>
<td>0.005</td>
</tr>
<tr>
<td>Quarterly, every 3 months, every 4th of a year</td>
<td>(.06)/4</td>
<td>0.015</td>
</tr>
<tr>
<td>Semiannually, every 6 months, every half of a year</td>
<td>(.06)/2</td>
<td>0.03</td>
</tr>
<tr>
<td>Annually, every year</td>
<td>0.06</td>
<td>0.06</td>
</tr>
</tbody>
</table>

6% means 6 percent (from Medieval Latin for per centum, meaning "among 100"). 6% means 6 among 100, thus 6/100 as a fraction and .06 as a decimal.

Here are some common units for this calculation:

- **nominal annual rate** has units of reciprocal year: for example, 0.06/year
- **the compounding period** is converted to years: for example, 3 months is converted to (1/4) year.
- **the interest rate for one period** is a pure number because the unit of years cancel in the calculation: (.06/year)*[(1/4)year] = .06/4.

### Some Examples With Various Interest Rates And Compounding Periods

<table>
<thead>
<tr>
<th>Nominal Interest Rate</th>
<th>Compounded</th>
<th>Interest Rate For One Period</th>
<th>Balance at the beginning of some period</th>
<th>Interest Added at the end of the same period</th>
</tr>
</thead>
<tbody>
<tr>
<td>15%/yr</td>
<td>Daily</td>
<td>0.000410959=.15/365</td>
<td>$10,000</td>
<td>$4.11</td>
</tr>
<tr>
<td>5%/yr</td>
<td>Monthly</td>
<td>0.004166667=.05/12</td>
<td>$10,000</td>
<td>$41.67</td>
</tr>
<tr>
<td>9%/yr</td>
<td>Quarterly</td>
<td>0.0225=.09/4</td>
<td>$10,000</td>
<td>$225</td>
</tr>
<tr>
<td>5.5%/yr</td>
<td>Semiannually</td>
<td>0.0275=.055/2</td>
<td>$10,000</td>
<td>$275</td>
</tr>
<tr>
<td>7.8%/yr86</td>
<td>Annually</td>
<td>.078=.078/1</td>
<td>$10,000</td>
<td>$780</td>
</tr>
</tbody>
</table>

1. "Nominal" in ordinary English can indicate something formal, in name only, but not quite reality and perhaps something that needs further description. It fits well here, because the effect of compounding is a real rate of interest slightly higher than the nominal rate of interest. Click
What Happens To An Account With Compounded Interest And No Withdrawals?

Consider now an account in which \( P_0 \) is invested at the beginning of a compounding period, with a nominal interest rate \( r \) and compounding \( K \) times per year (so each compounding period is \((1/K)^{th}\) of one year). How much will be in the account after \( n \) compounding periods? Let \( P_j \) denote the balance in the account after \( j \) compounding periods, including the interest earned in the last of these \( j \) periods. NOTE THAT WE HAVE JUST DEFINED A SEQUENCE OF REAL NUMBERS. To review what these sequences are, in general, see sequences of real numbers. Note that we have a recursive definition of this sequence:

\[
P_{j+1} = P_j + \text{the interest earned by } P_j \text{ in one compounding period.}
\]

In words, the balance at the end of a new compounding period is the balance at the end of the preceding period plus the interest that older balance earned during the compounding period. The interest earned is \( r \cdot (1/K) \cdot P_j \), as described above in the interest calculation for one period. Thus, at the end of the \((j+1)^{th}\) period,

\[
P_{j+1} = P_j + \text{the interest earned by } P_j \text{ in one compounding period}
\]

\[= P_j + (\text{nominal rate} \cdot \text{compounding period as a fraction of a year}) \cdot P_j
\]

\[= P_j + r \cdot (1/K) \cdot P_j
\]

\[= P_j + (r/K) \cdot P_j
\]

\[= P_j \cdot (1 + r/K)
\]

In the last line of the table above, \( P_j \) has been factored from the two terms of the previous equality. Here are some examples of the use of this formula, period by period:

<table>
<thead>
<tr>
<th>Values of &quot;j&quot;</th>
<th>( P_j )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( j=0 )</td>
<td>( P_1 = P_0 \cdot (1+r/K) )</td>
</tr>
<tr>
<td>( j=1 )</td>
<td>( P_2 = P_1 \cdot (1+r/K) = P_0 \cdot (1+r/K) \cdot (1+r/K) = P_1 = P_0 \cdot (1+r/K)^2 )</td>
</tr>
<tr>
<td>( j=2 )</td>
<td>( P_3 = P_2 \cdot (1+r/K) = P_0 \cdot (1+r/K)^2 \cdot (1+r/K) = P_0 \cdot (1+r/K)^3 )</td>
</tr>
<tr>
<td>( j=3 )</td>
<td>( P_4 = P_3 \cdot (1+r/K) = P_0 \cdot (1+r/K)^3 \cdot (1+r/K) = P_0 \cdot (1+r/K)^4 )</td>
</tr>
</tbody>
</table>

In general

\[
P_j = P_0 \cdot (1+r/K)^j
\]

for non-negative whole numbers \( j \). The rare person may wonder how we can leap to this conclusion about an infinite number of possible \( j \)'s, given only four examples! This formula can be proved for all of the infinite number of possible \( j \)'s by using the principle of mathematical induction.
For The Saver, There Is An Advantage To Compounding More Frequently. If One Fixes The Nominal Interest Rate And The Total Time The Account Collects Interest, More Frequent Compounding Produces More Interest. In the analysis below, we assume that the total time is a whole number multiple of compounding periods.

If one fixes the initial balance \( P_0 \), the nominal interest rate \( r \) and the duration of the deposit \( T \) (in years), you earn more interest with more compounding periods per year \( K \). The number of compounding periods that make up \( T \) will be \( KT \). To avoid fractions of compounding periods, which were not analyzed above, assume that \( K \) is such that \( KT \) is a whole number. Then, by the formula above,

\[
P_{KT} = P_0 \times (1+r/K)^{KT}.\]

With \( T \) and \( r \) fixed (not changing) for this discussion, view the right-hand side above as a function of real variable \( K \), say \( f(K) \). As long as \( 1+r/K \) is positive, this function will have a derivative:

\[
(d/dK)[f(K)] = P_0 \times (1+r/K)^{KT} \times \left[ T \times \ln(1+r/K) + K \times T \times \left(1/(1+r/K)\right) \times (-r/(K^2))\right].
\]

This simplifies somewhat:

\[
(d/dK)[f(K)] = P_0 \times (1+r/K)^{KT} \times T \times \left[ \ln(1+r/K) - r/(K+r)\right].
\]

It well known that for \( x \) in the interval \([0,1)\), we have \( \ln(1+x) \geq x - x^2/2 \). If we substitute \( r/K \) for \( x \) and assume that \( r > 0 \) and \( K > r \), we find that

\[
\ln(1+r/K) - r/(K+r)) \geq (K-r)r^2/(2K^2(K+r)) > 0
\]

["ln" refers to the natural logarithm, the log to the base \( e \).] Note that the derivative exists and is positive when \( P_0 \), \( r \), \( K \), and \( T \) are all positive and \( K > r \) (which are natural assumptions about a savings account!). Since the derivative is positive, the original function \( f(K) \) is increasing. Thus, larger values of \( K \) make \( f(K) \) larger. If we make \( K \) larger and also make \( KT \) be an integer, then \( f(K) \) happens to coincide with \( P_{KT} \). Thus compounding more frequently produces more interest (subject to the assumption that \( T \) is a whole number multiple of the compounding period). If \( T \) is not a multiple of the compounding period, the conclusion depends strongly on the account’s policies on withdrawals in the middle of a compounding period. For example, in some certificates of deposits the bank may charge a substantial penalty for “early” withdrawal.

What if we are utterly greedy, and insist that the bank compound our interest continuously?

What happens if we make the compounding period a millionth of a second, and ever smaller? Does the amount of interest increase forever without bounds, or do we reach a ceiling (a limit!) as we compound more and more frequently?

To answer these questions, consider \( g(K) = \ln(f(K)) \):

\[
g(K) = \ln(P_0) + (KT) \times \ln(1+r/K).
\]

As \( K \) approaches positive infinity, we have a race between two factors because \( KT \) is also approaching positive infinity (we assume that \( T \) is positive) while \( r/K \) approaches 0. As \( r/K \) approaches 0, \( 1+r/K \) approaches 1 and \( \ln(1+r/K) \) approaches 0. Thus we seem to have infinity*0 in our limit as \( K \) approaches positive infinity. Recall that L’Hôpital’s rule applies to indeterminate forms 0/0 and infinity/infinity. Rewrite the difficult part of \( g(K) \) to take advantage of this rule:

\[
g(K) = \ln(P_0) + \ln(1+r/K) / [1/(KT)].
\]
Note that $1/(KT)$ is approaching 0, so that we have the indeterminate form of 0/0. By L'Hôpital's rule, examine the limit of a new ratio which is the ratio of the separate derivatives of the top and bottom of the indeterminate form:

\[
\frac{1}{(1+r/(K))(\ln(r/(K))}/(1/(KT)-2^-T)
\]

After simplifying this new ratio, one has

\[
[1/(1+r/(K))] \times (r/(K)) \times [\ln(r/(K))] / (1/(1+r/(K))].
\]

As $K$ approaches positive infinity, this new ratio approaches $(r/(T)) \times [1/(1+0)] = r/T$. Thus, $g(K)$ has the limit $\ln(P_0^r) + rT$ as $K$ approaches positive infinity. Because $e^x$ is a continuous function, we can apply $e^x$ to the function $g(K)$ to get $f(K)$ back AND a limit for $f(K)$ which is

\[
e^{\ln(P_0^r) + rT} = P_0^r e^{rT}.
\]

Thus, compounding faster and faster does have a finite limit; this finite limit defines what economists (and bankers) mean by continuous compounding. If compounding is continuous at a nominal interest rate of $r$ for a duration $T$ (in years) with an beginning balance of $P_0$, the balance at the end is

\[
P_0^r e^{rT}.
\]

Your comments and questions are welcome. Please use the email address at www.math.hawaii.edu

Edited on September 6, 2006.

END QUOTE

Also, this nonsense about any “sister city” so councillors can have an excuse to visit overseas in a junk trip should be considered to be evidence that council concerned has no monies problems. Also, any venture a council may enter into that places it at risk and so purportedly would justify an above rate increase should be investigated if such a venture really was justified.

As I indicated previously Banyule City Council contemplated a $400 million project against which I was the only objector and it then didn’t proceed. But having demolished the swimming pool it then incurred a $40 million debt for a commercial enterprise which clearly with the wave pool was not simply for the rate payers but rather for a commercial enterprise to which municipal/shire councils should not get involved in. As such councils should be prohibited from engaging in any multimillion dollar project such as this wave pool without specific authority by the ESC. This as otherwise councils can circumvent any rate increase restrictions by simply engaging into multimillion dollar projects and then use that as an excuse to seek to justify increases beyond the rate cap. One also has to consider why a rate cap of 2.5% when the interest rate is much lower?

Senior citizens who are self-funded may year after year lose because the escalating rate by councils beyond the return of any investments they may have. Also, Social Security payments are ordinary in line with the CPI (Consumer Price Index) and as such I view any rates applied by councils (apart of my constitutional submitted issues) should therefore never be higher than the CPI.

This document is not intended and neither must be perceived to refer to all details/issues.

MAY JUSTICE ALWAYS PREVAIL®

(Our name is our motto!)

Awaiting your response, G. H. Schorel-Hlavka O. W. B. (Friends call me Gerrit)