

BACKGROUND

Linking associates the mortgage interest rate to the performance of an **Index**. That identity is purely mathematical. By Linking, the mortgagor signifies its requirement that interest be computed in a particular way. That right is valuable and enforceable, but it is not property. A Link is neither an asset nor a liability.

But suppose a mortgagor was prepared to create an asset and a liability in order to replicate a Link – specifically, by making a drawing under its mortgage to fund the acquisition of assets equivalent to the **Reference Assets**. We call this scenario “**Borrow To Invest**”.

This paper considers whether Borrow To Invest can plausibly replicate Linking.

REFERENCE ASSETS

We note that a borrower might Link “to the market” by selecting an Index that reflects a market-wide benchmark. We assume that the Reference Assets and the investments acquired by the Borrow To Invest mortgagor are the same, namely the basket of equities that make up the All Ordinaries index.

BORROW TO INVEST CONSIDERED

CASH NEUTRALITY CONSTRAINT

Linking is not the same as borrowing. For example, neither the scheduled repayments nor the outstanding balance of an Index Mortgage increase when a borrower initiates a Link. Of itself, Linking has no cashflow consequence to the borrower. Correspondingly, an “apples to apples” comparison requires that Borrow To Invest not require cash contributions external to the investment itself. We call this **cash neutrality**.

AFTER TAX ANALYSIS

For the reasons set out in Product Tax Ruling [PR 2017/3](#), Linking has no tax effect.¹ This is consistent with the nature of a Link.

¹ The ruling assumes (as does this paper) that the mortgage in question is given over the borrower’s principal place of residence.

On the other hand, there are tax consequences to borrowing to invest. Financial investments inhere taxes upon capital gains. Dividends paid on shares are taxable, but the tax payable may be alleviated by franking credits. And deductions for interest may be claimed upon funds borrowed to buy income producing assets. We must take these tax flows into account.

We must also consider whether tax benefits identified to Borrow To Invest are properly allowable. For example, interest charges are *prima facie* deductible when the debt is used to acquire income producing assets. And that is so no matter that the debt is secured over the borrower’s principal place of residence.

But if, for example, drawings are made under a loan facility that is “split” between a private purpose and an investment purpose then interest deductibility is capped by the principle in [Commissioner of Taxation v Hart](#) (“Hart’s Case”).² In short, unless the investment related drawings are repaid at the same rate as other drawings secured against the property, the so-called “additional interest” will not be deductible.

DEBT STRUCTURE

To assure full deductibility, the investment loan should be structured as a *credit foncier*.^{3,4} This gives rise to an issue because (to be properly comparable) Borrow To Invest must be cash neutral. As we show below, a *credit foncier* cannot meet this requirement, absent some unrealistic assumptions about dividend yields and/or mortgage rates.

By way of example, let’s assume an investment loan repayable by 300 equal, monthly in arrears instalments. Since the drawing is secured against the borrower’s principal place of residence, we assume a loan interest rate equal to the **Prime Borrower Home Lending Rate**.

We now compute the aggregate annual dividend flow required meet the first 12 loan repayments, thereby assuring cash neutrality over the first year. This translates into the following dividend yields.

Table 1: Mortgage Rate Versus Pre-Tax Cash Neutral Dividend Yield

Prime Borrower Home Lending Rate	Pre-Tax Cash Neutral Dividend Yield
3.00% per annum (convertible monthly)	5.6905% per annum
4.00% per annum (convertible monthly)	6.3340% per annum
5.00% per annum (convertible monthly)	7.0151% per annum
6.00% per annum (convertible monthly)	7.7316% per annum

However, dividend yields of this magnitude can’t reasonably be expected.

² (2004) 217 CLR 216.

³ That is, equal instalments comprising principal and interest computed such that at the end of the scheduled loan term the loan balance is zero.

⁴ See *Hart’s case* *ibid* especially per Gleeson CJ and McHugh J at [7] and [8].

For example, according to the [Australian Taxation Office](#), the average annualised dividend yield of a portfolio invested to the All Ordinaries mandate from 30 June 1998 to 31 January 2018 was 4.07%, well short of the required yields published in Table 1.⁵

Of course, one might reasonably say that Borrow To Invest need only be cash neutral **after tax**. After all, structuring the investment loan as a *credit foncier* assured the deductibility of interest. On the other hand, dividends will be taxed as income, albeit subject to the effect of franking credits.

Such considerations necessarily make for a complex analysis. For the moment we will make some simplifying assumptions that favour Borrow To Invest, namely:-

- Tax effects are experienced at the highest personal tax rate, presently 47%.⁶

This assumption maximises the utility of interest deductions. For example, a \$100 deductible interest charge has an (approximate) after-tax cost of \$60 to one who pays tax at a rate of 40%.⁷ Conversely, to one who pays at 20% the (approximate) after-tax cost is \$80. So arises the unsurprising proposition that tax deductions are more valuable to those who pay tax at higher rates.

- The analysis is limited to the first year.

Compared to any alternative assumption, this maximises the interest component of each *credit foncier* repayment.

And, for the sake of the argument, we also make the following assumptions, thereby allowing us to test Borrow To Invest in the limit, namely:-

- (a) All dividends are fully franked. This assumption will very probably be wrong, but is maximally favourable to the Borrow To Invest thesis.
- (b) Fully franked dividends are tax spared. This is plain wrong, but it is maximally favourable to the Borrow To Invest thesis.⁸

Even so, when we solve for the dividend yield required to meet after-tax cash neutrality, we see that it still exceeds the long-term average of 4.07%, as Table 2 demonstrates.

⁵ Our analysis dating back to September 1985 shows an average annualised dividend yield of 4.02%.

⁶ Includes the Medicare levy of 2%.

⁷ The after-tax cost of interest being: $(1 - \text{tax rate}) \times \text{interest charge}$. This calculation is approximate because tax savings are not experienced instantly. The tax system credits and debits taxpayers periodically, not continuously. Consequently, this equation overstates the benefit of tax deductions, by their time value.

⁸ That is, a taxpayer marginally taxed at a rate in excess of the corporate tax rate **will** pay tax upon a fully franked dividend (albeit at a lower rate than the marginal tax rate).

Table 2: Mortgage Rate Versus “Best Case” Post-Tax Cash Neutral Dividend Yield

Prime Borrower Home Lending Rate	Post-Tax Cash Neutral Dividend Yield
3.00% per annum (convertible monthly)	4.3006 % per annum
4.00% per annum (convertible monthly)	4.4777% per annum
5.00% per annum (convertible monthly)	4.6913% per annum
6.00% per annum (convertible monthly)	4.9394% per annum

The dilemma faced by Borrow To Invest is readily stated. Low interest rates reduce the monthly payment required to service the investment loan, and so reduces the dividend yield necessary for cash neutrality. But low interest rates also reduce the benefit of tax deductibility.⁹ And this partially counteracts the advantage of lower monthly repayments.

In the result, the relationship between the after-tax cost of debt and the after-tax cash neutral dividend yield is not linear. This is demonstrated by solving for the Prime Borrower Home Lending Rate which meets the after-tax cash neutrality requirement, given a dividend yield of 4.07% per annum. That rate solves to be less than 1.10% per annum.

CONCLUSION

Assuming against dividend yields in excess of the long-term average, the Borrow To Invest hypothesis cannot replicate a Link if mortgage rates exceed 1.10% per annum.

RELAXING THE CASH NEUTRALITY CONSTRAINT

The cumulative effect of Hart’s Case and the cash neutrality constraint mean the economic effect of Linking cannot be reproduced, absent some unrealistic expectations.

Since the judgment in Hart accords with the Commissioner’s view (held since 1998),¹⁰ it is unrealistic to suppose that view will change. To the contrary, [Tax Determination TD 2012/1](#) makes clear the Commissioner will challenge investment loans secured against a principal place of residence if the amortisation of the investment loan is deferred relative to the amortisation of the home loan.

But we might suppose that a Borrow To Invest mortgagor is prepared to meet shortfalls in the after-tax cashflows from its own free cash. That is, we might abandon the cash neutrality constraint. In that case we should apply equivalent amounts of free cash against the balance of the Index Mortgage. This enables an equivalent increase in the Link.¹¹

To model this we engage the assumptions in Schedule One. Our analysis extends until the Index Mortgage balance reaches zero, at which point we compute the result of $(A - B) - (C +$

⁹ For example, in the limit - an interest rate of 0.00% - the before and after-tax cost of borrowing is the same.

¹⁰ See [Tax Ruling TR 98/22](#).

¹¹ That is, we are still comparing “apples with apples” but now we are modelling the effect of allowing for cash contributions by the borrower to each scenario.

D) where:

- (a) A is the market value of the investment portfolio under the Borrow To Invest scenario;
- (b) B is the capital gains tax payable upon the sale of that portfolio at that market value;
- (c) C is the balance of the mortgage component of the Borrow To Invest scenario; and
- (d) D is the balance of the investment loan component of the Borrow To Invest scenario.

If the outworking of this equation is a positive number, then Borrow To Invest will have proved the better option. That is, the Borrow To Invest mortgagor will have paid off its mortgage (and its tax obligations) with cash to spare, whereas the Index Mortgage borrower will only have paid off its mortgage.

On the other hand, a negative result indicates that the Borrow To Invest mortgagor still owes money. That is, after liquidation of the investment portfolio and payment of all outstanding taxes, moneys remain outstanding under the mortgage. Conversely, the balance of the Index Mortgage is nil.

Finally, a foundational assumption bears repetition, namely that the Link and the investment portfolio identify to the same assets. Even so, important differences arise:-

- Under Borrow To Invest, after-tax dividends flows are applied to service debt, whereas no such requirement attends upon a Link. Consistent with that, Link **Index Values** are computed on a **Total Return** basis.
- On the other hand, the Link, having no interest charge associated to it, offers no tax deductions on account of interest. Conversely, the tax benefit of deductibility must be accounted for under Borrow To Invest. We do so by applying the tax saved pro rata to the private and investment loan balances at the end of each tax year.
- Ultimately, the Borrow To Invest borrower must redeem its investment. This will motivate the taxation of any capital gain, whereas there is no equivalent impost under the Index Mortgage.¹²

CONCLUSION

In our “**Base Case**” (defined by the assumptions in Schedule One) the Index Mortgage proves the better choice, offering a relative advantage of \$18,681.32 per \$100,000 of initial mortgage balance. We call the ratio of this advantage to the initial mortgage balance the “**Benefit Ratio**”. Hence, the Base Case Benefit Ratio is 18.68%.

¹² That is, a Link is not an asset that could be disposed of to yield a capital gain. Linking triggers an obligation to compute interest charges in a particular way. Removing a Link simply means the lender will revert to its usual method of computation.

When Borrow To Invest presents as the superior option the Benefit Ratio will be negative. As we demonstrate, such circumstances are improbable.

SENSITIVITY ANALYSIS

The advantage of the Index Mortgage relative to Borrow To Invest is principally sensitive to the following parameters:

- Capital Growth Rate** : The rate of growth in the price of a share. Here, the analogous index value is the All Ordinaries Index (as opposed to the All Ordinaries Accumulation Index).¹³
- Dividend Yield** : The trailing twelve month dividend yield of a basket of shares invested to the All Ordinaries mandate.
- Franking Rate** : The dollar value of all grossed up dividends (i.e. dividends grossed up to include imputation credits) relative to the dollar value of all dividends paid.
- Interest Rate** : The Prime Borrower Home Lending Rate.

We report our sensitivity testing to changes in these parameters by way of the Tables at page 9. Our calculation methodology inheres varying one parameter whilst holding all others constant to the Base Case and re-computing the Benefit Ratio.

By way of example, if we increase the Franking Rate to 100% then the Benefit Ratio diminishes to 14.37%. Obviously, 100% is the upper limit of the Franking Rate. It is a limit unlikely to be realised in practice.¹⁴ Moreover, by definition, an index that does not reflect a pool of equities that pay franked dividends (such as an international share index) necessarily instantiates a Franking Rate of 0.00, which increases the Benefit Ratio to 22.99%.

Ceteris paribus to the Base Case, if the corporate tax rate falls to 25% then the Benefit Ratio increases from 18.68% to 19.64%. This is because the quantum of a franking credit is a function of the company tax rate. Hence, varying the company tax rate impacts Borrow To Invest, but not the Index Mortgage.

BREAK EVEN AND LIMIT ANALYSIS

We also undertake break even and limit analysis by iterating a single parameter such that the Benefit Ratio is 0.00%, in which case the mortgagor will be ambivalent as between the Index

¹³ The compound annual growth rate (“CAGR”) for the All Ordinaries Accumulation Index from 31 December 1979 to 26 February 2018 was 11.35% per annum. Assuming an annualised dividend yield of 4.07% (payable quarterly in arrears) – as to which see page 3 above – the Capital Growth Rate solves to be 7.00% per annum.

¹⁴ To the contrary, even funds specifically mandated to invest in high dividend yielding Australian equities rarely report Franking Rates in excess of 80%.

Mortgage and the Borrow To Invest alternatives. The parameters capable of being “stressed” in this way are the Capital Growth Rate and the Interest Rate. The “break even” values for these parameters are:

Capital Growth Rate	:	1.38%
Interest Rate	:	9.22%

So, taking the Capital Growth Rate result, given a constant:

- (a) Interest Rate of 4.00% per annum;
- (b) Dividend Yield of 4.07% per annum; and
- (c) Franking Rate of 50.00%,

the borrower would logically prefer an Index Mortgage over Borrow To Invest unless it believed the Capital Growth Rate over the mortgage term would likely be less than 1.38% per annum.

The remaining parameters (Dividend Yield and Franking Rate) cannot be tested in this way, simply because the Benefit Ratio proves to be greater than zero even when these parameters are set to the lower limit. This is to recognise that neither the Dividend Yield nor the Franking Rate can be negative (less than zero). Correspondingly, we report the Benefit Ratio in the circumstance of the relevant parameter being set to zero, which results report as follows:

Dividend Yield	:	4.0125%
Franking	:	14.373%

CONCLUSIONS

- We conclude that Borrow To Invest cannot reliably reproduce the benefits of Linking.
- Assuming against dividend yields significantly in excess of the long-term average, the cash neutrality constraint means Borrow To Invest can’t replicate a Link when mortgage rates exceed 1.10% per annum.
- Relaxing the cash neutrality constraint, a preference for Borrow To Invest depends upon unwarranted assumptions as to Franking Rates, Capital Growth Rates and borrowing costs.

Schedule One – Base Case Modelling Assumptions

Index Mortgage

Open Mortgage Balance	:	\$100,000
Open Index Participation	:	\$15,000
Base Mortgage Rate	:	4.00% per annum, convertible monthly.
Benchmark Rate	:	The same as the Base Mortgage Rate.

Borrow to Invest

Open Mortgage Balance	:	\$100,000
Open Investment Loan	:	\$15,000
Open Investment Balance	:	\$15,000
Mortgage Rate	:	4.00% per annum, convertible monthly.
Investment Loan Rate	:	The same as the Mortgage Rate.

Reference Asset / Investment Portfolio Performance

Dividend Yield Annual	:	4.070%.
Capital Growth Rate	:	7.000%.

Tax Rates

Marginal Personal Rate	:	47% including Medicare levy.
Company Rate	:	30%.

Dividends

Franking Rate	:	50%.
Paid	:	Quarterly in arrears.

Capital Gains Tax

Method	:	CGT discount method.
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Other

Index Mortgage	:	Fully costed.
Borrow to Invest	:	Costed per Vanguard's Australian Shares Index Retail Fund.

Sensitivity Tables

Dividend Yield, Franking Rate = Per Base Case					
Capital Growth Rate	Interest Rate				
	4.00%	5.00%	6.00%	7.00%	8.00%
4.00%	12.49%	9.30%	4.26%	-8.62%	-40.25%
5.00%	14.77%	4.28%	10.52%	4.28%	-12.59%
6.00%	17.16%	16.55%	14.29%	10.94%	3.60%
7.00%	18.68%	18.17%	17.34%	14.71%	11.02%
8.00%	20.39%	19.77%	18.95%	18.02%	15.10%

Interest Rate, Franking Rate = Per Base Case					
Capital Growth Rate	Dividend Yield				
	1.00%	2.00%	3.00%	4.00%	5.00%
4.00%	-3.77%	2.25%	7.25%	11.97%	16.19%
5.00%	1.57%	6.29%	10.76%	14.93%	18.11%
6.00%	5.32%	9.39%	13.43%	16.71%	19.88%
7.00%	7.93%	11.71%	15.21%	18.45%	21.77%
8.00%	9.91%	13.36%	16.65%	19.93%	22.98%

Interest Rate, Dividend Yield = Per Base Case					
Capital Growth Rate	Franking Rate				
	0.00%	25.00%	50.00%	75.00%	100.00%
4.00%	17.35%	14.92%	12.49%	10.06%	7.63%
5.00%	19.38%	17.07%	14.77%	12.46%	10.16%
6.00%	21.63%	19.40%	17.16%	14.93%	12.69%
7.00%	22.99%	20.84%	18.68%	16.53%	14.37%
8.00%	24.62%	22.50%	20.39%	18.27%	16.16%

Capital Growth Rate, Franking Rate = Per Base Case					
Dividend Yield	Interest Rate				
	4.00%	5.00%	6.00%	7.00%	8.00%
1.00%	7.93%	5.49%	0.59%	-12.34%	-39.90%
2.00%	11.71%	9.99%	7.01%	1.13%	-16.75%
3.00%	15.21%	14.36%	12.75%	8.52%	1.04%
4.00%	18.45%	17.80%	16.72%	14.98%	10.85%
5.00%	21.77%	21.95%	21.12%	19.05%	17.19%

Interest Rate, Capital Growth Rate = Per Base Case					
Dividend Yield	Franking Rate				
	0.00%	25.00%	50.00%	75.00%	100.00%
1.00%	9.54%	8.74%	7.93%	7.13%	6.33%
2.00%	14.48%	13.10%	11.71%	10.32%	8.94%
3.00%	18.82%	17.01%	15.21%	13.40%	11.59%
4.00%	22.71%	20.58%	18.45%	16.32%	14.19%
5.00%	26.59%	24.18%	21.77%	19.36%	16.96%

Capital Growth Rate, Dividend Yield = Per Base Case					
Interest Rate	Franking Rate				
	0.00%	25.00%	50.00%	75.00%	100.00%
4.00%	22.99%	20.84%	18.68%	16.53%	14.37%
5.00%	23.09%	20.63%	18.17%	15.71%	13.26%
6.00%	23.10%	20.22%	17.34%	14.46%	11.58%
7.00%	21.56%	18.14%	14.71%	11.28%	7.85%
8.00%	19.70%	15.36%	11.02%	6.68%	2.34%