

The Treatment of Gains on the Sale of Assets

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1. Introduction

Over the period in which the Commission is assessing Excess Earnings on gas pipeline businesses, asset sales have occurred between firms subject to assessment (both intra-sector transactions and transactions with firms outside the sector). This raises the question of how gains on sale of such assets should be dealt with. This paper examines this question.

2. Intra-Sector Transactions

The Excess Earnings for a firm over a period t is as follows

$$\text{Excess Earnings}_t = \text{Earnings}_t - k_t A_{t-1}$$

where k_t is the cost of capital for year t and A_{t-1} is the asset base at the beginning of year t . Such measures are open to various possible manipulations and perversities. Consequently, certain fundamental principles must be observed. The first of these is that intra-sector transactions (either between or within firms) should have no effect upon the sector in aggregate, i.e., the Excess Earnings of the sector in aggregate should be invariant to intra-sector transactions, unless they have tax implications (“neutrality”)¹. Applying this principle to gains on sale arising from intra-sector transactions, it follows that either

- (a) gains on sale between firms in the sector should be ignored both in the income of the seller and in the asset base of the purchaser; or
- (b) gains on sale of assets between firms in the sector should be treated as income of the seller and the purchase price is recognised as the new asset base of the buyer.

An alternative policy is as follows.

- (c) recognising the gain on sale as income of the seller whilst continuing to use the ODV of the asset in determining the asset base of the purchaser.

Policy (c) would fail the neutrality test, and lead to conclusions about the existence of

Excess Earnings that were unwarranted.

Consider the following example. Firms 1 and 2 are identical, with each having Earnings of \$100m, an asset base of \$1000m and a cost of capital of .10. There is no depreciation. Accordingly, the Excess Earnings of each firm are zero as follows.

$$\text{Excess Earnings} = \$100m - .10(\$1000m) = 0$$

The aggregate of these Excess Earnings over the entire sector is therefore also zero.

Now suppose that firm 1 sells half of its assets to firm 2, at a price of \$600m, at the beginning of a year. This implies a gain on sale of \$100m. In selling half of its assets, half of firm 1's Earnings (exclusive of the gain on sale) are assumed to flow over to firm 2. If this gain on sale is included in the Earnings of firm 1, but has no impact upon the allowed asset base of firm 2, then the Excess Earnings of each firm will be as follows.

$$\text{Excess Earnings}(1) = \$50m + \$100m - .10(\$500m) = \$100m$$

$$\text{Excess Earnings}(2) = \$150m - .10(\$1500m) = 0$$

So, for the sector as a whole, the Excess Earnings have risen from zero to \$100m, simply as a result of an intra-sector transaction, i.e., neutrality fails. This problem is purely a result of adopting policy (c), and can be resolved by adopting either policy (a) or (b).

If policy (a) were adopted, then the Excess Earnings of each firm would be as follows.

$$\text{Excess Earnings}(1) = \$50m - .10(\$500m) = 0$$

$$\text{Excess Earnings}(2) = \$150m - .10(\$1500m) = 0$$

¹ The tax implications arise from interactions with an entity outside the sector (IRD).

Aggregate Excess Earnings are then zero, and neutrality is achieved. By contrast, if policy (b) were adopted, the Excess Earnings of firms 1 and 2 would be as follows.

$$\text{Excess Earnings}(1) = \$50m + \$100m - .10(\$500m) = \$100m$$

$$\text{Excess Earnings}(2) = \$150m - .10(\$1600m) = -\$10m$$

Aggregate Excess Earnings are then \$90m, and this appears to violate neutrality. However, firm 2 would experience a reduction of \$10m in its Excess Earnings in every future year, and the present value of this impact would be -\$100m. So, across time, neutrality would be achieved. Clearly, instantaneous attainment of neutrality is preferable to attainment of it over time. So, policy (a) is preferred.

3. Transactions with External Parties

We now turn to the question of transactions with parties outside the sector. For example, suppose that an asset was sold for more than ODV to a firm outside the sector. The second general principle that should be observed in determining Excess Earnings is that transactions between the sector and the rest of the economy should matter. Without this principle, there is nothing to calculate. It follows that the sale price on an asset sold to a firm outside the sector is relevant. This conclusion contrasts with that relating to intra-sector transactions.

4. Tax Issues

Sale prices (even on intra-sector transactions) have tax implications and these are now considered. These tax implications arise from interactions between the sector and an external party (IRD). Following the second principle, they must then have the potential to affect Excess Earnings for the sector as a whole. Asset sales can give rise to timing differences between regulatory and tax depreciation, and they can also give rise to a

divergence between total tax and total regulatory depreciation over the life of the asset. This gives rise to the question of which depreciation figures should be used, and how. In addressing this question, a third fundamental principle that is invoked is that Excess Earnings should accord with the underlying economic situation, i.e., the present value of the Excess Earnings should equal the NPV of a project (the present value principle). Since intra-sector asset sales are neutral, except for tax effects, this analysis can be conducted for the sector as a whole.

We start with a situation in which tax depreciation matches regulatory depreciation, and then introduce a sale transaction within the sector. The following initial scenario is assumed. Assets are purchased from outside the sector for \$10m, with a life of two years and no salvage value, operating costs are expected to be \$3.1m in year 1 and \$3.2m in year 2, regulatory and tax depreciation is \$5m per year, the corporate tax rate is .33, and the cost of capital is .10. Following the building block model, the expected revenues of the business in year 1 are the sum of the cost of capital, depreciation, operating costs and taxation as follows.

$$E(REV_1) = .10(\$10m) + \$5m + \$3.1m + .33[E(REV_1) - \$3.1m - \$5m]$$

Solving for $E(REV_1)$ yields

$$E(REV_1) = \frac{.10(\$10m)}{1 - .33} + \$5m + \$3.1m = \$9.59m$$

Similarly, for the second year, the expected revenues are thus.

$$E(REV_2) = \frac{.10(\$5m)}{1 - .33} + \$5m + \$3.2m = \$8.95m$$

The present value of these revenues is as follows.

$$PV = \frac{\$9.59m - \$3.1m - .33[\$9.59m - \$3.1m - \$5m]}{1.10} + \frac{\$8.95m - \$3.2m - .33[\$8.95m - \$3.2m - \$5m]}{(1.10)^2} = \$10m$$

This matches the initial investment of \$10m, and so the NPV of the investment is zero. Consistent with this, the Excess Earnings in each year of the project are expected to be zero, as follows.

$$E(\text{ExcessEarnings}_1) = \$9.59m - \$3.1m - .33[\$9.59m - \$3.1m - \$5m] - \$5m - .10(\$10m) = 0$$

$$E(\text{ExcessEarnings}_2) = \$8.95m - \$3.2m - .33[\$8.95m - \$3.2m - \$5m] - \$5m - .10(\$5m) = 0$$

We now consider a sale transaction within the sector. Suppose the assets of this business are sold to another company within the sector at the end of the first year. If the sale price is less than \$10m (say \$8m), then the tax depreciation claimed by the first company over the first year will be \$2m (\$5m less the gain on sale of \$3m). The second company then claims \$8m over the second year, for a total of \$10m. So, the sale merely alters the timing of the tax depreciation. In respect of a timing divergence between regulatory and tax depreciation, Lally (2002) shows that tax depreciation should be used in assessing the tax expense whilst regulatory depreciation should be used elsewhere in the calculation, because this yields Excess Earnings whose present value matches the present value of the cash flows.

We now suppose instead that the asset is sold for \$12m, yielding tax depreciation of zero in the first year and \$12m in the second year. For the sector in aggregate, the present value of the cash flows will then be as follows.

$$PV = \frac{\$9.59m - \$3.1m - .33[\$9.59m - \$3.1m]}{1.10} + \frac{\$8.95m - \$3.2m - .33[\$8.95m - \$3.2m - \$12m]}{(1.10)^2} = \$10.41m$$

This PV exceeds the initial cost of the assets (NPV = \$.41m), i.e., the revenues of the business exceed its costs in present value terms. Invoking the third fundamental principle, the present value of the Excess Earnings should match the NPV. To ascertain whether this does occur, we consider three possible approaches to assessing Excess Earnings.

Method 1: Tax depreciation is used to assess the tax expense whilst regulatory depreciation is otherwise used in the calculations. The Excess Earnings (in aggregate) are then as follows.

$$E(\text{ExcessEarnings}_1) = \$9.59m - \$3.1m - .33[\$9.59m - \$3.1m] - \$5m - .10(\$10m) = -\$1.65m$$

$$E(\text{ExcessEarnings}_2) = \$8.95m - \$3.2m - .33[\$8.95m - \$3.2m - \$12m] - \$5m - .10(\$5m) = \$2.31m$$

The present value of these Excess Earnings is \$.41m. So, these Excess Earnings calculations reflect the underlying economic situation. However, any assessment of Excess Earnings at the end of year 1 would give rise to misleading conclusions. Of course, this is a general problem, of which there are many other examples.

Method 2: Tax depreciation is used everywhere in these calculations of Excess Earnings. The Excess Earnings are then as follows.

$$E(\text{ExcessEarnings}_1) = \$9.59m - \$3.1m - .33[\$9.59m - \$3.1m] - .10(\$10m) = \$3.35m$$

$$E(\text{ExcessEarnings}_2) = \$8.95m - \$3.2m - .33[\$8.95m - \$3.2m - \$12m] - \$12m - .10(\$12m) = -\$5.39m$$

The present value of these Excess Earnings is -\$1.41m, and therefore these calculations do not reflect the underlying economic situation. Method 2 is then flawed.

Method 3: Regulatory depreciation is used everywhere in these calculations of excess earnings. The excess earnings are then as follows.

$$E(\text{ExcessEarnings}_1) = \$9.59m - \$3.1m - .33[\$9.59m - \$3.1m - \$5m] - \$5m - .10(\$10m) = 0$$

$$E(\text{ExcessEarnings}_2) = \$8.95m - \$3.2m - .33[\$8.95m - \$3.2m - \$5m] - \$5m - .10(\$5m) = 0$$

The present value of these Excess Earnings is zero and therefore these calculations do not reflect the underlying economic situation. Method 3 is then flawed.

In summary, the only method of assessing Excess Earnings that is compatible with the underlying economic situation is the first method, i.e., tax depreciation is used to assess the firm's tax expense whilst regulatory depreciation is otherwise used in the calculations. The conclusion here matches that in Lally (2002).

5. Conclusion

Gains on the sale of assets within the set of firms that are regulated give rise to the question of how they should be treated. Three fundamental principles are invoked here. The first is that, in assessing Excess Earnings, intra-sector transactions should not affect the aggregate Excess Earnings of the sector, leaving aside tax implications (neutrality). With the latter caveat, it follows that gains on sale should be completely ignored in respect of both seller and buyer or they should be recognised fully in respect of both parties. By contrast, treating gains on sale as income for the seller, whilst ignoring their impact upon the asset base of the buyer, raises Excess Earnings for the sector as a whole. This violates the principle of neutrality. In respect of the two policies that observe neutrality (completely ignoring the transaction or completely recognizing it), the first achieves neutrality instantaneously whilst the second only achieves it across the life of the assets in question. Clearly, instantaneous attainment of neutrality is preferable to attainment of it over time and therefore the first policy is preferred. This involves ignoring gains on sale in respect of both the buyer and the seller.

The second general principle is that the Excess Earnings of the sector must be sensitive to

transactions between the sector and the rest of the economy. Without this principle, there would be nothing to calculate. It follows that the sale price on an asset sold to a firm outside the sector is *relevant*. This conclusion contrasts with that relating to intra-sector transactions.

The third general principle that should be observed is that the present value of the Excess Earnings on an operation should match its NPV. Invoking this principle, it is shown that tax depreciation should be employed for determining the tax expense whilst regulatory depreciation is used elsewhere in the determination of Excess Earnings. This conclusion holds even in the presence of an intra-sector transaction. The use of tax (or regulatory) depreciation everywhere in the calculations does not satisfy this test. The conclusion here is a generalisation of that in Lally (2002).

REFERENCES

Lally, M. 2002, *Measuring Excess Earnings on Airfields*, paper prepared for the Commerce Commission.