

Valuation in Corporate Finance: a new look. (I, Aderemi Fadele, am the sole author and as such I have permission to post the full text on SSRN).

This research note offers a rationale for regularly observed industry concentration as industries mature. And for mergers within and across industries. The received advice in the Finance literature as of 2005 was against conglomerate mergers. Furthermore the literature had no explanation for merger waves. We revisit these issues below. In addition we take a new look at the Capital Budgeting decision.

We assume stochastic Income, spending and credit limits due to:

Employment/unemployment,

Self – imposed or external credit constraints,

Spending limits,

Amongst other factors.

Furthermore, there is further heterogeneity in these factors between firms, due for instance, to Market segmentation and targeting Marketing strategies.

$$V_{\text{firm}} = V(V_1, V_2)$$

$V_1$ : Stochastic Income, spending and credit limits channel

$V_2$ : Option pricing channel

$$V_{\text{Levered firm}} = V_{\text{Unlevered firm}} + \tau\beta - \text{PV}(\text{Business disruption costs});$$

$$\text{Variance}(\text{Portfolio of customer spending}) = \sum \sum w_i w_j \text{COV}(X_i, X_j)$$

We assume that customers come in types and there are stable proportions of them in the firm's market.

Copeland, Weston and Shastri (2014) report that as the number of customers increases

'Variance (Portfolio of customer spending)' decreases, approaching the average covariance:

$$\text{cov}(X_i, X_j)$$

$$V_{\text{Levered firm}} = V_{\text{Levered firm (from NPV type analysis)}} - V_{\text{European put option sold to shareholders by debtholders}}$$

$$V_{\text{Firm}} = V_1 + V_2$$

$$\Delta V_{\text{Firm}} = \Delta V_1 + \Delta V_2$$

$$= \Delta V_1 + \int \partial V_2 / \partial K * dK$$

For a cash based merger  $\Delta V_1 > 0$  due to the lowering of the Present Value of Business disruption costs which are proportional to cashflow Value at risk (Jorion (2007), Hubbert (2011)).

Assuming independent and normally distributed customer spending

Cashflow Value at risk =  $\alpha \cdot \text{Var}(\text{Portfolio of customer spending}) \cdot I$

Where  $\alpha$  is a standard normal deviate, and  $I$  is the initial value of customer spending.

This creates an incentive for mergers - intra – industry and across industry to seek the benefits of diversification. This author knows of the example of an OECD Software firm that considered going into a different industry within the same country during a recession in search of new projects for example.

The optimal firm size is determined by the trade – off between this effect and dis - economies of scope as the firm gets very large.

Mergers however are often funded by significantly increased debt levels. When firm assets follow a geometric Brownian motion,  $\partial V_2 / \partial K < 0$

Thus in a debt – funded merger there is a third factor in the trade – off. The resulting optimization problem determines the optimal size of the firm.

Furthermore in a continuous – time framework merger waves can be explained by the stochastic processes of customer income/spending and their correlations. For intuition the correlation between customer spending can differ during recessions and “boom” times. In recessions there may be significant heterogeneity of incomes/spending whereas in boom time most people might be doing well.

In real – world applications managers would be concerned about the negative advice on the effects of increasing scope of business on the ability of management to manage the firm. However the economic performance of large diversified economies such as the US and the UK suggests that given good technology levels and given good management systems, increasing business scope, within reason, should not be an insurmountable problem for well educated and capable modern managers.

Furthermore given the magnitude of economies of scale, of synergies and of business disruption costs (up to 15% of firm value for business disruption costs alone (Copeland et. al (2014))), the finance literature’s opposition to conglomerate mergers is wrong. If conglomerates are under – performing, economists and business scholars should take more care in locating the sources of the failure and in ascribing blame.

At the level of Capital budgeting a generalised adjusted PV rule (GAPV) should be used. The NPV of a project should be modified not only for costs and benefits of financing but for reduction in business disruption costs due to diversification effects in customer spending. This is also new.

$$\text{GAPV} = \text{base case NPV (unlevered)} + \sum \text{PV (financing effects)} + \text{PV (diversification effects)}.$$

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