

Excess Cash Flow Method and Required Rates of Return



~ GUEST COLUMNIST ~

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The excess cash flow (“ECF”) method¹ has been widely used by valuation professionals for many years. Many of these practitioners appreciate the method’s simplicity while their clients and some courts have grown accustomed to seeing it used. But the ECF method has not garnered full acceptance throughout the valuation profession for some important reasons.

This article starts by noting similarities between the ECF method and a corporate performance measurement technique known as residual income (“RI”). For decades RI has been recommended as the preferred technique to measure corporate value-creation performance over other techniques such as return on investment (“ROI”) or return on equity (“ROE”).² After this comparison, the article analyzes technical concerns about the ECF method – the treatment of rates of return and measurement of net tangible assets. The article concludes by proposing adjustments to the ECF methodology that could address some of the technical and practical concerns about it.

EXCESS CASH FLOW METHOD

Originating during Prohibition as the excess earnings or formula method, the ECF method has a long history of application in specific areas of the business valuation profession. It has received some updating and theoretical attention in recent years, thanks largely to the efforts of leading business valuation authors.³ Despite these improvements the ECF method continues to be discouraged by the Internal Revenue Service⁴ due to technical concerns that cannot be fully reconciled with current valuation theory.

The principal use of the ECF method is to make an estimate of a company’s intangible asset value distinct from its net tangible asset value. There are important examples in

which a business’ value must be split between tangible and intangible assets, marital dissolution valuations involving professional practices being the most common example. The income and market approaches typically determine a company’s value as a lump sum and typically do not distinguish between value derived from intangible assets and net tangible assets.⁵ The asset approach does separately consider tangible and intangible asset value, but deriving values for individual assets can be time consuming and expensive. The ECF method, however, gets away from an exclusive focus on either earnings or cost by looking at the required return on assets employed in a business. When rates of return are combined with assets employed the method becomes a hybrid of the income and asset approaches and, if properly applied, can serve as a bridge between them.

The ECF method treats the cash flows of a company as coming from two sources, net tangible assets and

intangible assets, and uses valuation principles to convert cash flow into value. In analytical terms, the method is generally presented as shown in the chart below.⁶

In practice there are many variations of the ECF method. The example below represents what I believe to be certain “best practices” including:

- 1) utilizing the market value of net tangible assets instead of book value,
- 2) using cash flow to invested capital instead of earnings,
- 3) valuing invested capital instead of

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<i>(Dollars in Thousands)</i>	
Normalized cash flow to invested capital	\$10,500
Net tangible asset value	\$40,000
Rate of return on net tangible assets	16%
Cash flow attributable to net tangible assets	(6,400)
Excess cash flows	4,100
Rate of return on intangible assets	30%
Market value of intangible assets	13,667
Add net tangible asset value	40,000
Market value of invested capital (“MVIC”)	53,667
Less debt	(10,000)
Market value of equity	\$43,667
Return on MVIC (10,500 ÷ 53,667)	19.6%

equity directly and
4) making sure that the total return on MVIC approximates a company's weighted average cost of capital ("WACC") less anticipated growth.⁷

SIMILARITIES WITH RESIDUAL INCOME

The ECF method has close similarities with measurements of residual income, which many large and mid-sized U.S. businesses have long used as a performance measurement tool. Measuring management's value creation performance—its ability to enhance the value of the business it is entrusted with—is an important task in corporate finance. RI is often recommended as a superior measure over return on investment when evaluating management's ability to enhance the value of the company.⁸ A common presentation of RI is shown in the box below.⁹

Unlike the ECF method, RI measurements do not result in a value.¹⁰ They are intended to result in residual income, which is hypothesized as a reflection of management's ability to create value from the resources they have been entrusted with. A foundation of corporate finance is that if a company is generat-

ing returns in excess of its cost of capital, it is increasing the value of the firm. Likewise, if a company generates returns less than its cost of capital it is decreasing the value of the firm. RI captures this essential concept. A positive RI indicates value creation while a negative RI indicates value destruction. RI is viewed in absolute terms, not relative terms. Those projects or business units that produce a greater level of residual income create more value. So all proposed projects with a positive RI should be accepted; and in the event of a capital constraint, the projects with the greatest RI should be accepted (even if their relative rate of return is not the highest).

As the previous tables demonstrate, the calculation of excess cash flows under the ECF method is very similar mechanically to the calculation of residual income. Their commonality indicates that in broad terms the ECF method is supported by well-established corporate finance theory. If so, then it is not the technique that causes doubts about the ECF method, but the details in how the method is executed.

TECHNICAL CONCERNS

Weaknesses of the ECF method come in two forms – theoretical and practi-

cal. One of the primary theoretical weaknesses is that distinct rates of return for tangible and intangible assets cannot be observed in the market.¹¹ They are, quite simply, only an estimate. The primary practical weakness is that the method requires an appraisal of a company's tangible assets, which rarely happens in practice. Many valuation analysts use book value as a proxy for market value most likely due to cost and timing constraints arising from appraisals of individual tangible assets.¹² An analysis of these concerns follows.

Rates of Return

Valuation practitioners often assume that expected rates of return vary by type of asset. It makes sense because there are many specific examples in everyday business of an asset being matched to its funding. Common examples include car loans or home mortgage loans. Financial firms are often most active in directly matching an asset to its funding. Some larger industrial firms will securitize their accounts receivable providing a direct link between the asset and its funding source. Asset-based finance is another example in which the advances on a line of credit are tied to a certain percentage of accounts receivable and inventories and have a different cost than other loans.

In each of these examples we see funding rates that are often far less than the company's WACC. And these examples are an important reason that practitioners assume varying rates of return by asset type. The evidence from these examples is influential because short-term financing costs for near-cash assets (accounts receivable) are generally less than mid-term financing costs for equipment which are generally less than longer-term unsecured financing. So the assumption is that this hierarchy continues down the balance sheet with the highest rates for intangible assets, goodwill being the highest, because they are the most risky from a lender's perspective
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<i>(Dollars in Thousands)</i>		
Revenue		\$2,000
Expenses, except depreciation	450	
Depreciation	50	(500)
Income before taxes		1,500
Less income taxes		(525)
After tax operating profit		\$975
Net operating assets	\$5,000	
Less operating liabilities	(500)	
Net operating investment	\$4,500	
Capital charge – required rate of return	20%	(900)
Residual income		\$75

when liquidation is considered.¹³

The hierarchy of rates of return appears reasonable from a technical perspective also. The quicker an asset can be converted to cash, generally the lower its financing cost. In other words, it appears that the cost of funds of an asset class has a close relationship with its liquidity. Banks tend to be more willing to take more liquid assets such as accounts receivable as collateral than they are to take a customer list. Accounts receivable are generally collected over a fairly predictable collection cycle. Likewise, inventories can be turned into receivables through a predictable operating cycle. Because of their longer time and more complex process to convert to cash, inventories generally have a meaningfully lower advance rate than do accounts receivable. Markets exist for many types of equipment and most real estate, but the time to convert them to cash is generally longer than that for current assets.

Individual intangible assets, on the other hand, are difficult to convert to cash. There are examples of transactions occurring for individual intangible assets but many tend to be licensing transactions where cash is received over an extended period of time.¹⁴ It is not often that intangible assets are sold individually apart from the sale of an entire company. Therefore banks are generally less likely to place explicit emphasis on them from a collateral perspective.

There are important examples, however, that create questions about whether the hierarchy is absolute. A few are discussed in the following paragraphs.

- **Discount terms:** Many privately held companies offer discount terms on their accounts receivable. Traditional discount terms, 2 percent/10 net 30, would seem to imply a very high cost associated with receivables. I have written an article, though, that demonstrates when discount terms are stated in a manner consistent with a firm's cost of capital they are quite similar.¹⁵ Since

so many firms have utilized discount terms over such an extended period of time, it would be fair to say that they have viewed the cost of those accounts receivable in terms of the company's overall cost of capital, and not a lower loan-based cost.

- **Factoring:** It is commonly reported that factoring accounts receivable can carry annual interest rates up to, and even exceeding 20 percent. Certainly there are other influences that impact the implicit rate charged by factors. As an example, many companies that use factors are young/growing or troubled. But a factor's claim on accounts receivable is quite direct, so to some extent they are insulated from certain of the risks associated with their customers' businesses. Importantly, two companies selling to the same large customer could experience dramatically different financing costs with exactly the same underlying accounts receivable as collateral; the only difference being one is financed by a bank while the other is financed by a factor.
- **Risk inversion:** Risk inversion can happen in a number of situations. A timely example is when industries go through hard times as happened in the automobile industry during 2008/2009. During that period the riskiest asset in many suppliers' balance sheets were accounts receivable from GM, Chrysler and many "Tier One" parts suppliers that were teetering on the brink of bankruptcy. In essence the risk relationship between receivables and other asset classes inverted. The situation is broad-ranging and includes any number of near-cash and depreciable assets in healthy or troubled industries. Commodity inventories can experience sharp changes in market conditions; large capital expenditures for seemingly mundane assets can prove to be the straw that broke the camel's back. In these cases assets further up the hierarchy could be considered to be the most risky.

- **Fixed / variable costs:** It is generally agreed that a fixed cost structure tends to increase the risk of a firm over a variable cost structure. Importantly, it would seem that fixed costs tend to be associated with tangible assets (new factory, new production line) while variable costs tend to be associated with intangible assets (trained production team, new process layout). Attributing a higher cost of capital to intangible assets would seem to be inconsistent with the apparent relationship between cost behavior and asset type.

There is a reinforcing effect that allows better-run companies to obtain funding at lower rates – on all sources of capital. If we assume that better-run companies tend to have relatively greater intangible value, then it is the existence of these intangible assets that allow a company to obtain funding for all other assets at more favorable rates. There is a common saying for it in shorthand – “capital follows management,” meaning that stronger management teams— which produce better-run companies with greater intangible value—have better access to lower-cost sources of capital.

Also, there does not appear to be any evidence from the public capital markets that investors value cash flow differently whether it is derived from current assets or intangible assets. As long as the overall risk/return characteristics of the firm are maintained, investors should be indifferent about the source of cash flows.

In corporate finance it is common to view the funding of a company as a package. The financial managers
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expert TIP

This is a fresh look at how the excess cash flow method is similar to corporate performance measures of residual income.

of any company can pick and choose among various available financing options to establish a capital structure that best meets their long-term and short-term goals. As markets shift or as management's view of the firm's risk profile changes they can adjust the package of financing to better fit those market conditions. The cost of such a package of financing is known as the weighted average cost of capital, or WACC. From a performance measurement perspective, it is generally recommended that any project's (or company's or division's) cost of funds be viewed in terms of its particular WACC. In my experience, differing rates of return are generally not attributed to different asset classes for performance measurement purposes.

It would appear to be logical to assume that rates of return do vary by asset class, with intangible assets being the most risky assets. Although market-based returns cannot be observed, the assumption is supported by sound reasoning. However, there are important examples that call the assumed hierarchy of rates of return into question. In the absence of empirical market data supporting either conclusion, the financial reporting realm appears to have adopted the discrete application of rates of return by asset type. Until more empirical support is provided, it would make sense to follow the lead of those practitioners in the financial reporting field.

An important question is whether useful insights can be drawn from varying required rates of return by asset class in the ECF method. If so, then continuing the practice could be useful. The following example was prepared to test whether varying rates of return by asset class has a meaningful impact on the attribution of value between tangible and intangible assets.

The table takes the ECF method example we began with and merely changes the rate of return applied to each asset class. But it keeps one requirement that leading authors agree on – that the total return on MVIC

<i>(Dollars in Thousands)</i>	Hitchner Page 135	Slight Difference in Returns	Sharp Difference in Returns
Normalized cash flow to invested capital	\$10,500	\$10,500	\$10,500
Net tangible asset value	40,000	40,000	40,000
Rate of return on net tangible assets	16.0%	19.0%	8.0%
Cash flow attributable to net tangible assets	(6,400)	(7,600)	(3,200)
Excess cash flows	4,100	2,900	7,300
Rate of return on intangible assets	30.0%	21.4%	53.5%
Market value of intangible assets	13,667	13,551	13,645
Add net tangible asset value	40,000	40,000	40,000
Market value of invested capital ("MVIC")	53,667	53,551	53,645
Less debt	(10,000)	(10,000)	(10,000)
Market value of equity	\$43,667	\$43,551	\$43,645
Return on MVIC (WACC - growth)	19.6%	19.6%	19.6%

should approximate a company's overall capitalization rate (WACC minus growth). All other elements of the calculation remain the same. As the above table demonstrates, there is very little difference in value by asset class when rates of return are changed between the scenarios. Whether one uses widely varying discount/capitalization rates or slightly varied rates, the attribution between tangible and intangible assets is the same as long as the overall return on MVIC is the same. As a result, the capitalization/discount rates selected for intangible/net tangible assets become irrelevant. The key rate is the company's overall capitalization rate

(WACC minus growth), because that is what determines the relative value in each asset category.

Additionally, difficulties arise when varying rates of return by asset class. Consider the top table on the next page.

The table again uses the ECF method example we began with and only varies normalized cash flow to invested capital. Note that the value attributed to intangible assets does vary meaningfully between the scenarios. Importantly, though, note that the return on MVIC also varies between the scenarios. Differing returns on
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FINANCIAL VALUATION - Excess Cash Flow Method, continued

MVIC in each scenario causes great difficulty, because a basic requirement of corporate finance theory is that the value of the firm should rise or fall such that the return on MVIC is always equivalent to a company's WACC minus growth.

It is the lack of equivalence in the return on MVIC between the scenarios that causes concern about varying rates of return. Without equivalence, the rates of return utilized are something of an unknowable quantity. A suggestion of differing growth rates given different cash flows can't explain it – if we assume that the three scenarios represent three different companies with the exact same risk/return and growth characteristics, then a simple difference in the magnitude of cash flows should have no impact on the overall return on MVIC – value should rise or fall so the return equalizes.

A suggestion of differing tangible asset values as a result of differing cash flows doesn't explain it either. Often, companies with similar tangible asset bases will have widely different total market values due to one management team's ability to create and maintain intangible asset value. Additionally, if cash flows attributable to net tangible assets are the same in each scenario then the value should be the same as long as their required rate of return is the same. Therefore, all of the difference in value in the top table is not captured in the value of intangible assets. In fact, the only way the ECF method attains equivalence in this example is if we assume no growth and the same discount / capitalization rate for each asset class, as is shown in the table at bottom right.

The foregoing table demonstrates that changes in the market value of invested capital flow through intangible assets first, which is a significant weakness of the ECF method. It places an inordinate emphasis on tangible assets. The ECF method assumes that a company is generating the required return on tangible assets,
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<i>(Dollars in Thousands)</i>	Lower Cash Flow	Use Base Assumptions	Higher Cash Flow
Normalized cash flow to invested capital	\$10,000	\$10,500	\$11,000
Net tangible asset value	40,000	40,000	40,000
Rate of return on net tangible assets	16%	16%	16%
Cash flow attributable to net tangible assets	(6,400)	(6,400)	(6,400)
Excess cash flows	3,600	4,100	4,600
Rate of return on intangible assets	30%	30%	30%
Market value of intangible assets	12,000	13,667	15,333
Add net tangible asset value	40,000	40,000	40,000
Market value of invested capital ("MVIC")	52,000	53,667	55,333
Less debt	(10,000)	(10,000)	(10,000)
Market value of equity	\$42,000	\$43,667	\$45,333
Return on MVIC (WACC - growth)	19.2%	19.6%	19.9%

<i>(Dollars in Thousands)</i>	Lower Cash Flow	Use Base Assumptions	Higher Cash Flow
Normalized cash flow to invested capital	\$10,000	\$10,500	\$11,000
Net tangible asset value	40,000	40,000	40,000
Rate of return on net tangible assets	19.6%	19.6%	19.6%
Cash flow attributable to net tangible assets	(7,840)	(7,840)	(7,840)
Excess cash flows	2,160	2,660	3,160
Rate of return on intangible assets	19.6%	19.6%	19.6%
Market value of intangible assets	11,020	13,571	16,122
Add net tangible asset value	40,000	40,000	40,000
Market value of invested capital ("MVIC")	51,020	53,571	56,122
Less debt	(10,000)	(10,000)	(10,000)
Market value of equity	\$41,020	\$43,571	\$46,122
Return on MVIC (WACC - growth)	19.6%	19.6%	19.6%

FINANCIAL VALUATION - Excess Cash Flow Method, continued

which may not always be the case. If an analyst believes that a company is not generating the required return on tangible assets, or something near it, then the ECF method may not be an appropriate technique to utilize.

Net Asset Value

For tangible and intangible assets there is general agreement that they are both stated at market value in the ECF method.¹⁶ Because market value is anticipatory (the value of an asset is equal to the present value of its expected future cash flows), the value of both tangible and intangible assets reflect the effect of future anticipated growth in the ECF method.

An important difference in RI measurements, though, is that the use of net tangible assets is basically an asset accumulation concept, not a value concept.¹⁷ The idea behind RI is to calculate a capital charge for the resources that have been placed in management's care. By using an asset accumulation concept instead of a value concept for net tangible assets, management need not be concerned with movements in the market – something over which they have no control. An important element of corporate performance measurement is that management should focus on those things that their team can control. Management should not be evaluated on those things over which they have no control – general movements in the market affecting value being an important one.

Viewed this way, the return required on net tangible assets in the RI method is akin to the coupon on a debt security. The promised return is paid on the face value of the note, not the market value of the note. The providers of capital earn a return on cash they gave to the company. If the value of their claim goes up due to general market movements or due to management increasing the value of net tangible and intangible assets, the promised return does not change. In this context it is widely accepted in corporate finance that the capital charge

in the RI method is calculated using a discount rate, not a capitalization rate, which is in agreement with the ECF method.

Even though it is often done in practice, it is not helpful to add the accumulated cost of net tangible assets to the market value of intangible assets – then the valuation conclusion will not reflect fair market value of all the assets. Fortunately, corporate finance theory allows for a useful resolution to the issue.

PUTTING IT ALL TOGETHER

Let's look at the original analysis and make a few changes. First, only one rate of return – the WACC – is used for all asset classes (assuming a 3 percent growth rate). Second, the capital charge is derived from an asset accumulation concept (instead of a value

concept). Third, the required corporate finance equivalence between value and required rate of return is relied on to solve for the market value of net tangible assets.

The calculation below of the ECF method is insightful, because it recognizes that management can create value in different ways. Management can increase the value of net tangible assets by maintaining them efficiently or by arranging them so that their “in place” value is maximized. Management can create or increase the value of intangible assets by building a cohesive team of employees that generates strong customer loyalty. Either way, the value of the firm increases.

It would appear that employing the ECF model in this fashion allows analysts to stay more closely aligned
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<i>(Dollars in Thousands)</i>	Lower Cash Flow	Use Base Assumptions	Higher Cash Flow
Normalized cash flow to invested capital	\$10,000	\$10,500	\$11,000
Net tangible assets adjusted book value	40,000	40,000	40,000
Rate of return on net tangible assets	22.6%	22.6%	22.6%
Cash flow attributable to net tangible assets	(9,040)	(9,040)	(9,040)
Excess cash flows	960	1,460	1,960
Rate of return on intangible assets	19.6%	19.6%	19.6%
Market value of intangible assets	4,898	7,449	10,000
Add net tangible asset value (a)	46,122	46,122	46,122
Market value of invested capital (“MVIC”)	51,020	53,571	56,122
Less debt	(10,000)	(10,000)	(10,000)
Market value of equity	\$41,020	\$43,571	\$46,122
Return on MVIC (WACC - growth)	19.6%	19.6%	19.6%

(a) Determined by dividing the cash flow attributable to net tangible assets by WACC-g

with established valuation theory. It has an additional practical benefit – if an appraisal of the net tangible assets is not available then an analyst can estimate it consistent with valuation theory. Equivalence in the corporate-wide capitalization rate can be relied on to estimate the market value of net tangible assets.

There may be circumstances in which equivalence with a firm’s overall capitalization rate is not adequate to measure the value of net tangible assets. But these circumstances would be applicable in other valuation methods as well. A common example is real estate that has significantly appreciated in value. Well-known normalization techniques can be used to capture such an additional increment of value.

By using WACC across all asset classes, differences in value among assets are driven by cash flows and the required return is indicated by the use to which the assets are put, consistent with widely accepted corporate finance practice. Such an assumption is also consistent with good management practices. By attributing higher required rates of return to intangible assets, management may develop a bias in their decision-making process to bulk up on tangible assets instead of further developing intangible value. Using a consistent required rate of return across all asset classes forces management to focus on cash flow, which is the most controllable indicator of a firm’s value from management’s perspective.

CONCLUSION


Conceptually, the ECF method has merit. The main sticking point has long been the treatment of rates of return

which are quite theoretical for individual asset classes. While the assumed hierarchy of rates of return by asset type is logical, contradictions in observable market data would seem to raise questions about it. WACC is also theoretical but it has the advantages of being based on market data, widely studied and generally accepted in the valuation discipline. Research of WACC has been quite good. Importantly, using WACC provides a basis for constructive discussion about differences of opinion. If rates of return are estimated for individual assets, based principally on the analyst’s judgment, there is likely to be little objective basis to resolve differences of opinion.

Additionally, from a practical standpoint the ECF method generally results in a combination of book value (for tangible assets) and market value (for intangible assets). If the intended result of applying the ECF method is the fair market value of the firm, then the value of tangible assets should be addressed by obtaining individual appraisals of assets or by relying on the equivalence with the firm’s overall capitalization rate.

This article has proposed two adjustments to the ECF method to address these concerns:

- 1) Use a single rate of return across all asset classes based on the company’s WACC, and
- 2) Use an asset accumulation concept when measuring the required return on net tangible assets, and solve for the market value of net tangible assets (when tangible asset appraisals are not available).

In both cases the analysis shows that the adjustments are consistent with corporate finance theory. 

¹ The ECF method is also referred to as the excess earnings method.

² Robert N. Anthony, John Dearden, Norton M. Bedford, *Management Control Systems* (Homewood Illinois: Richard D. Irwin, Inc., 1984), p. 345.

³ James R. Hitchner, *Financial Valuation: Applications and Models*, 2nd edition (New Jersey: Wiley and Sons, Inc., 2006), pp. 133-142; Shannon Pratt, Robert F. Reilly, and Robert P. Schweihs, *Valuing a Business*, 4th edition (New York: McGraw-Hill, 2000), pp. 281-303; Gary R. Trugman, *Understanding Business Valuation*, 3rd edition (New York: American Institute of Certified Public Accountants, 2008), pp. 329-339.

⁴ Revenue Ruling 68-609 states, “Accordingly, the “formula” approach may be used for determining the fair market value of intangible assets of a business only if there is no better basis therefore available.”

⁵ Income and market approaches can be used to value intangible assets directly, but in the context of an entire business these approaches do not distinguish between tangible or intangible assets.

⁶ Hitchner, p. 135 (formatting has been changed to fit the presentation here).

⁷ Leading authors would seem to agree that the total return on MVIC should approximate a company’s overall capitalization rate (WACC minus growth). For additional information see Hitchner, p. 139; Pratt, p. 291; and Trugman, p. 335.

⁸ G. Bennett Stewart III, *The Quest for Value*, (New York: HarperCollins, 1991). This book had a meaningful impact on corporate performance measurements when it introduced a specialized form of residual income known as Economic Value Added® (“EVA®”).

⁹ Similar to the ECF method, RI measurements vary in practice. The example presented here is a common view of residual income in the author’s experience.

¹⁰ However, EVA® as developed by Stewart contained certain modifications to the residual income calculation which allowed it to be used as a valuation tool as well.

¹¹ Literature supportive of distinct rates of return for specific tangible and intangible assets under ASC 805 is growing, although observable market rates remain difficult to obtain.

¹² Pratt, p. 287.

¹³ Hitchner, p. 140 for an insightful schematic of the relationship.

¹⁴ The Financial Valuation Group has developed a very useful database of such transactions.

¹⁵ Ron DiMattia, “Discount Terms: A Framework for Negotiation,” *The Credit and Financial Management Review*, First Quarter 1996, pp. 27-30.

¹⁶ Hitchner, pp. 136-137, Pratt pp. 286-288, and Trugman, p. 332.

¹⁷ Stewart, p. 86.