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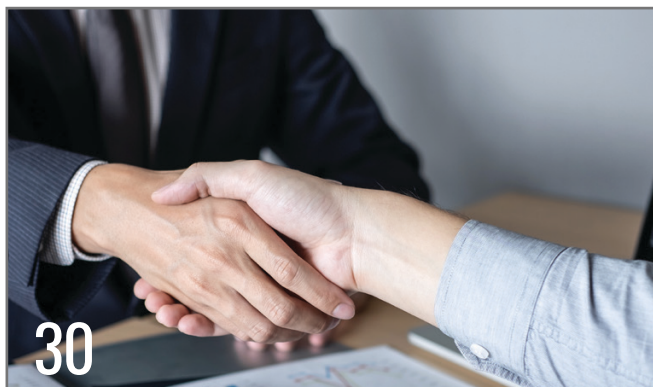
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## From the Executive Director's Desk



**THOMAS MORROW, CIRA**  
AIRA

This issue is coming out on the heels of our 35th Annual Conference in Boston. To those of you who were able to attend I hope that you enjoyed the fantastic educational program the planning committee put together. If you missed it, I hope you will be able to join us in Chicago next year.



*Hon. Joan N. Feeney, honored at AC19*

Our annual dinner on Thursday night was especially memorable for two reasons. We started the evening by **honoring the career of Hon. Joan N. Feeney**. Judge Feeney has just retired after 27 years as a bankruptcy judge in Massachusetts. During her tenure she was highly respected and always very busy. She spent 23 years as a member of the Bankruptcy Appellate Panel for the First Circuit and presided over a full range of cases, including complex commercial cases with multiple parties and conflicting interest. During her service as bankruptcy judge she wrote over 500 opinions in many different areas of law. With her reputation as an impartial, compassionate, candid, fair-minded, tireless and brilliant jurist, it is not surprising Hon. Feeney is embarking on a new career as a mediator for JAMS (formerly known as Judicial Arbitration and Mediation Services, Inc.). I can't think of a more qualified mediator than Judge Feeney. Congratulations on your career as a bankruptcy judge and best wishes in your new role as mediator for JAMS!



*Jay Alix, Manny Katten awardee*

Our annual dinner concluded with **presenting the Manny Katten award to Jay Alix**, chosen by unanimous vote of AIRA's board. One of the pioneers in the restructuring field, Jay was one of my early mentors and it was part of his vision to build restructuring into a career that people could pursue. He was one of the first to adopt the role of Chief Restructuring Officer – in fact, Jay's name was given to the Jay Alix Protocol setting forth the terms that the U.S. Trustee will accept for professional employment as CRO in bankruptcy cases. Beyond his role as an innovator in the restructuring field, the board also wanted to recognize the work Jay is doing now to protect the integrity of the bankruptcy system. Jay has been working hard to make sure that all firms follow the requirements of Rule 2014 to disclose all connections to parties in interest in any bankruptcy case for which they seek employment. After accepting the award, Jay spoke to the audience about why this is such an important issue worthy of the time and effort he is putting into it.

### 2019 COURSE SCHEDULE

## CIRA

Part:	Dates:	Location:
2	Nov 05-15	Online
3	Dec 10-20	Online

## CDBV

Part:	Dates:	Location:
3	Sep 03-19	Online
1	Nov 05-15	Online

**2020 course schedules  
coming soon!**

**More information  
and registration  
at [www.aira.org](http://www.aira.org)**

# A Letter from AIRA's President



**BRIAN RYNIKER, CIRA**  
*Ryniker Consultants, LLC*

Dear AIRA members and friends:

The end of the AIRA's 35th Annual Bankruptcy and Restructuring Conference marks the begin of my term as president of the Association. I would like to thank the past president Kevin

Clancy for all his hard work with the various regional and annual conferences as well as the continuation of moving our mission and objectives forward.

I enjoyed seeing many of you at this year's Annual Conference held in Boston, MA. I want to thank our three conference Co-chairs – Eric A. W. Danner, CIRA (CohnReznick LLP), Stephen B. Darr, CIRA CDBV (Huron) and Lynne Xerras (Holland & Knight LLP); our Judicial Co-chairs Judge Joan Feeney (Bankr. D. MA) and Judge Bruce A. Harwood (Bankr. D. NH); the entire planning committee, our sponsors and the AIRA staff for all of their hard work and support in planning and implementing this year's conference and making it a great success.

Over the past few years as a member of the AIRA as well as a board member I have had the honor of assisting in preparing many other conferences. Please make the effort to join us at some of our future events.

- September 17, 2019 – 8th Annual Energy Summit at The Belo Mansion and Pavilion, Dallas, TX
- November 1, 2019 – Annual AIRA Breakfast Program at NCBJ at the Marriott Marquis, Washington, DC
- November 18, 2019 – 18th Annual Advanced Restructuring & POR Conference at The Union League Club, New York, NY



*Scholarship recipient Jeff Larkin*

Now I would like to turn to the AIRA Grant Newton Educational Endowment Fund. In 2011 the AIRA Board of Directors established a scholarship fund in recognition of Executive Director Grant Newton's life-time

contribution and support of the Association. This year, the 2019 Endowment Fund Scholarship was awarded to Jeffrey Larkin at Pepperdine University's Annual Spring Accounting Banquet in April. Jeff was chosen by Pepperdine accounting faculty for outstanding academic performance and service to the department. He has excelled in his accounting classes and is currently doing an internship as an Assurance Intern with Ernst & Young in Tysons Corner, VA. His good grades resulted in the receipt of three different awards and scholarships this academic year, but his achievement goes beyond his own academic success in that he has demonstrated a heart for mentoring others. This spring, as a teaching assistant for the Financial Accounting course and research assistant, Jeff exhibited strong work ethic and reliability in managing experiment data and disbursing compensation to participants. As a teaching assistant, he helped other students master accounting concepts outside of office hours, showing concern for students and investment in their success. During internship searches, Jeff was always available to answer questions about the application process and provide lower class students with tips for excellent interviews.

If you wish to contribute to the AIRA Grant Newton Educational Endowment Fund please visit our website or contact Sue Cicerone at [scicerone@aira.org](mailto:scicerone@aira.org).

I hope everyone enjoys their summer.

*Brian Ryniker*

## An Invitation from AIRA Journal

*AIRA members and others are invited to submit articles, proposed topics and content-related questions to the AIRA Journal Editorial Board: Michael Lastowski [mlastowski@duanemorris.com](mailto:mlastowski@duanemorris.com), David Bart [David.Bart@rsmus.com](mailto:David.Bart@rsmus.com) and Boris Steffen [bsteffen@glassratner.com](mailto:bsteffen@glassratner.com). Articles are currently being accepted for upcoming quarterly issues; see AIRA Journal information and Authoring Guidelines at [www.aira.org](http://www.aira.org).*

*To inquire about placing an ad in AIRA Journal contact Michael Stull [mstull@aira.org](mailto:mstull@aira.org)*



# HIGHER EDUCATION: A RESTRUCTURING PERSPECTIVE<sup>1</sup>



**ROBERT HERSHAN**

*Alvarez & Marsal*

## Introduction

The value of higher education once seemed unquestionable, and the pipeline of resources to support academic programs, research and student financial aid appeared unwavering. While the higher education sector continued to grow for decades with rising student populations, increasing federal research funds and robust investment markets, recent trends demonstrate the landscape for U.S. colleges and universities is changing. The news earlier this year involving admissions scandals in higher education may be disturbing, but the industry has more widespread challenges to overcome to survive or even thrive in a highly competitive industry. The reality is that costs, alternative revenue streams and student enrollment have shifted – all in the wrong direction – applying significant pressure to academic boards and management teams who now must reevaluate their business models in pursuit of long-term sustainability. Negative demographic trends, declining

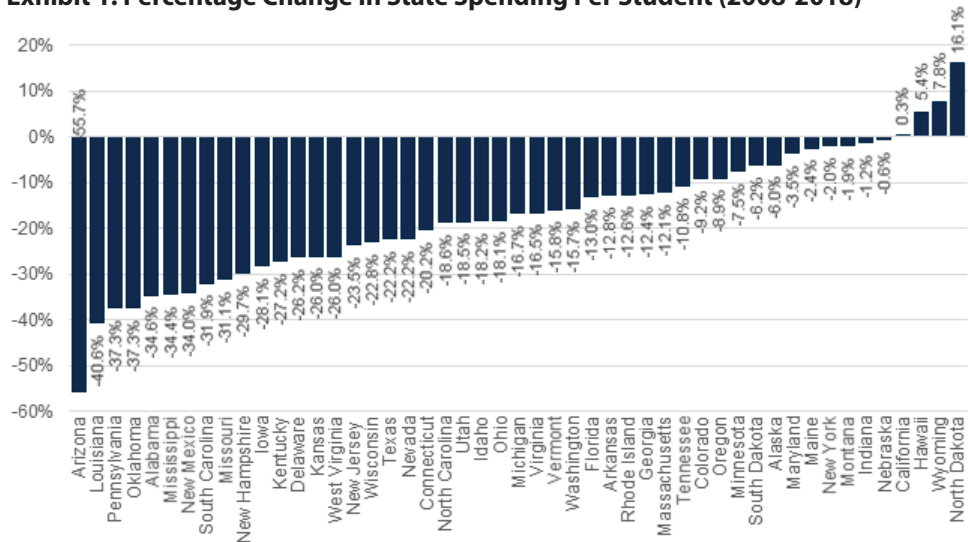
revenue streams and student questions about whether college is still worth the investment are just a few of the significant hurdles institutions must clear over the next decade.

More specifically, state funding for higher education has been declining since the start of the Great Recession, showing no signs of rebounding even as the economy steadily improves. At the same time, the future of federal funding for academic research, grants and loans is, at best, uncertain. Proposed changes to the Higher Education Act and versions of the federal budget include further reductions to federal Pell Grant reserves, changes to loan consolidation and borrowing limits for both students and parents and a potential, yet significant, decrease of more than 13 percent to the Department of Education's resources.

The decline of state and federal funding has shifted more of the cost burden for higher education to students and their families. In the last 10 years, annual tuition rates increased by 35 percent on average with several U.S. states witnessing rises of 60 percent or more at four-year, public institutions. Real median income growth doesn't come close to matching those tuition hikes.

<sup>1</sup> This article is an updated version of a 2018 outlook published on Alvarez & Marsal's website. It was produced with research and support from A&M's Insight Center, which provides A&M professionals and clients with actionable insights derived through proprietary studies and research. See list of sources on p.47.

**Exhibit 1: Percentage Change in State Spending Per Student (2008-2018)**



Source: Center on Budget and Policy Priorities

Consequently, college enrollment has declined as more students and families question the potential return on investment in higher education. Some institutions are finding competition (and others opportunity) in alternative delivery methods like massive open online courses (MOOCs) that offer classes, credentials and a growing number of degree programs at significantly lower costs. At least two dozen state universities and public institutions have been talking openly about significant expansion of their online education programs. One system, the University of Missouri, expects enrollment to jump from 75,000 to 100,000 by 2023 as it expands online programs. Like Missouri, many schools hope that rolling out more robust online learning will result in higher tuition revenue. Meanwhile, international student enrollment – a key source of tuition income for many institutions – is also falling off, driven by uncertainty about future U.S. immigration policies and rising competition from colleges and universities in other countries.

All these factors are placing never-before-seen financial stress on U.S. colleges and universities, and there is the urgent need for greater focus on thoughtful fiscal responsibility across the higher education sector. Annual cash operating deficits and thin liquidity are common in higher education today, and in most cases, are non-sustainable. Credit rating agencies Standard & Poor's (S&P), Moody's and Fitch Ratings continue to express skepticism about the fundamental stability of higher education. Each service recognizes that financial statements continue to weaken across the sector as a whole, and operating pressures continue to increase, resulting in the sector facing significant challenges from all directions.

The unmistakable bottom line is that higher education is in a new environment, one that more closely resembles the corporate landscape with steep competition,

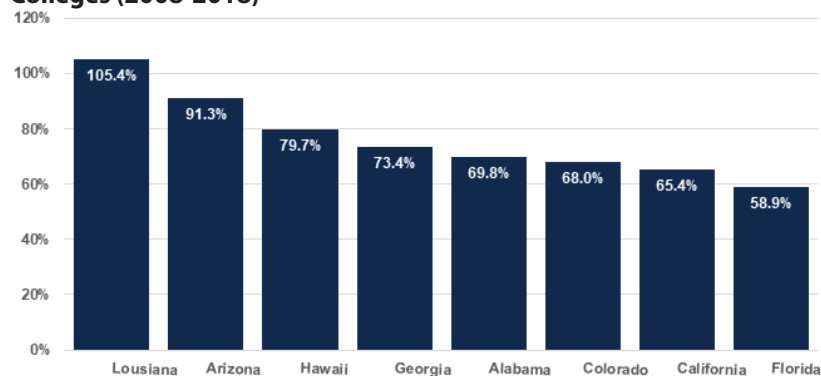
constant pressure to demonstrate value to all its constituents and an expectation of greater self-support. To remain viable, U.S. colleges and universities must adapt. This article highlights the challenges facing higher education and explores solutions for creating sustainable financial, operational and academic models to ensure each institution remains equipped to fulfill its mission.

## Challenges Facing Higher Education

At a very high level, financial sustainability is the greatest challenge threatening the ability of U.S. colleges and universities to fulfill their individual missions. Nearly all funding sources – government allocations and grants, tuition and debt financing – have been squeezed, and changes in one source can have a domino effect on the others. On the expense side, most schools are simply spending more than they can afford. Importantly, though, the challenges are more than financial. Colleges and universities also require updated operational and academic strategies, coordinated with financial responsibility, to sustain their core mission. Revenue enhancement and cost cutting, in the absence of strategies that are aligned with investment in and resource allocation to the institution's mission, will likely fail to achieve true sustainability.

## Declining Government Funding

State funding of public higher education institutions in the U.S. declined by 16 percent between 2008 and 2017, falling to an average state spend per student of approximately \$1,500. In the 2014-15 academic year, the average cost per student for a four-year public college or university – including student services, academic support and instructional support – was more than \$10,000. Of the 44 U.S. states that reduced funding for higher education during that timeframe, more than 40 percent made cuts of 20 percent or greater (Exhibit 1).

**Exhibit 2: Percentage Change in Average Tuition at Public, 4-Year Colleges (2008-2018)**


Source: Center on Budget and Policy Priorities

To compensate for these losses, many colleges and universities increased tuition substantially, shifting more of the financial burden of higher education to students and their families. The published average annual tuition increased by 39 percent over the last decade with eight states seeing hikes of 60 percent or more at four-year, public institutions. Arizona and Louisiana, which had the greatest declines in state funding during that timeframe at 55.7 and 40.7 percent respectively, increased tuition by more than 90 percent (Exhibit 2). Overall, net tuition as a total percentage of educational revenue has increased by 30 percent since before the Great Recession, growing from 36.7 percent in 2006 to 46.4 percent in 2017 (Exhibit 3). Tuition increases over the past decade have far outpaced increases in inflation. Hence, the pressure on affordability and, consequently, accessibility.

While tuition rates rose sharply, real median income only grew by about 2 percent. The gap between the rate of increase in college tuition compared to the rate of increase in household income has contributed to a more than 9 percent rise in student debt between 2008 (55 percent) and 2016 (60 percent). In the fourth quarter of 2018, the total value of student debt at four-year, public institutions was \$1.57 trillion.

Federal loans are the primary source of debt financing for students, and reliance on these has outpaced reliance on private loans over the past decade with compound annual growth rates (CAGR) of 10.9 percent and 2.9 percent respectively (Exhibit 4). Because of

this, proposed changes to federal funding for higher education have significant implications not only for institutions, but also for students and families seeking financial aid for higher learning. The current administration is pushing for a greater reliance on private funding for student financial aid. This has the potential to make higher education less accessible to low-income students since private loans typically offer less flexible repayment plans compared to federal loans. As a consequence, an ongoing challenge in higher education today is maintaining both affordability and accessibility

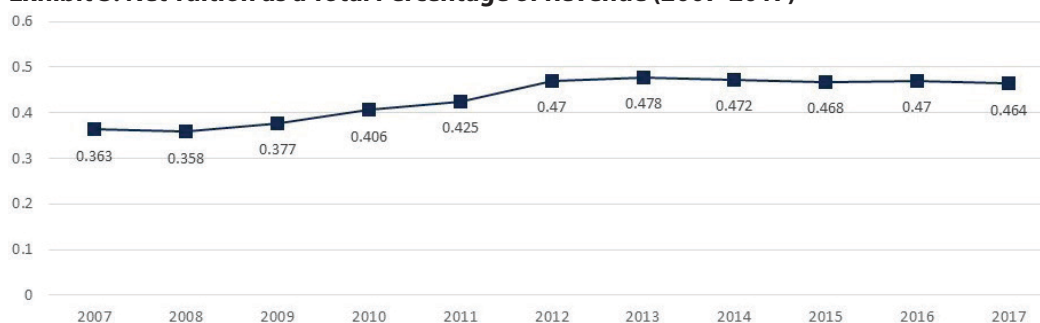
to foster a diverse student population.

Other changes being discussed at the federal level that could impact debt financing decisions for students and their families include changes to loan consolidation and borrowing limits, an end to loan forgiveness for public sector workers and an increase in income-based repayment plans from the current 10-percent rate of a students' post-graduation monthly income to 12.5 percent.

Versions of the 2018 federal budget recommended up to a 13.5 percent year-over-year decrease in the Department of Education's resources through the elimination of more than 20 programs, most of them focused on assistance for low-income students, and up to a 16 percent decrease in federal Pell Grant reserves (\$3.9 billion) while maintaining a maximum award of \$5,920 per student.

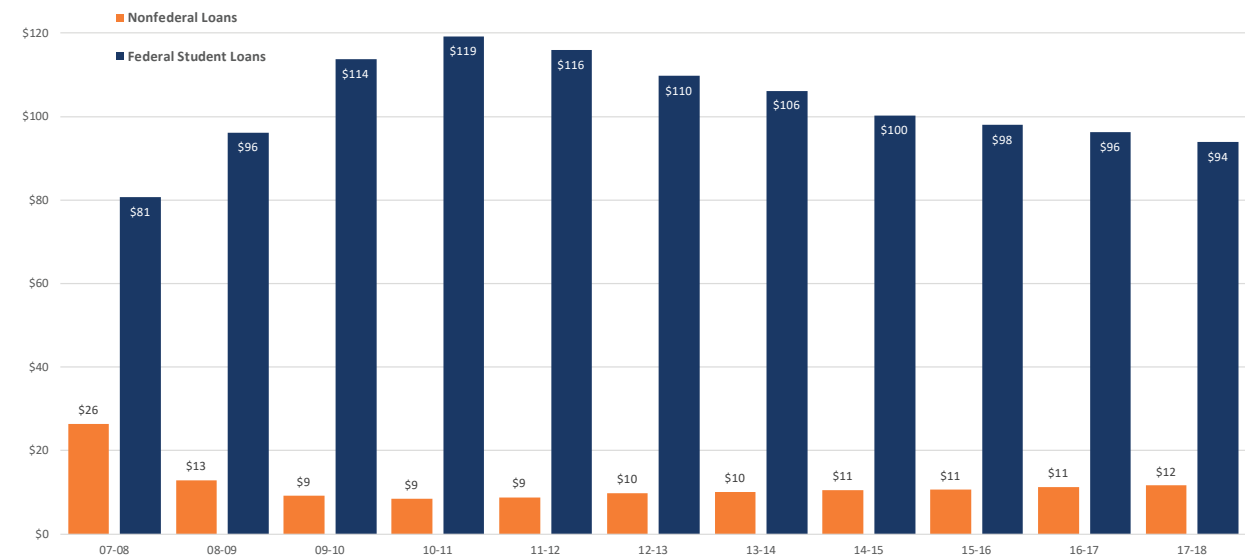
**Drop-offs in Student Enrollment**

In response to the rising cost burden of higher education on students and their families, overall U.S. college and university enrollment is declining. Between 2011 and 2016, enrollment in U.S. institutions dropped 7.8 percent from 20.6 million to 19 million. The rate of decline may be escalating. In Spring 2017, post-secondary enrollment fell by more than 272,000, a year-over-year decrease of 1.5 percent. In the fall of 2018, four-year, for-profit institutions experienced the greatest decline at 15.1 percent compared to 3.2 percent for two-year, public institutions and 2.4 percent for private, non-profits (Exhibit 5). Declining enrollment is expected

**Exhibit 3: Net Tuition as a Total Percentage of Revenue (2007-2017)**


Source: State Higher Education Executive Officers

**Exhibit 4: U.S. Student Loans by Type and Enrollment Period (\$ Billions, 2007-2018)**



Source: College Board

to continue through at least 2030. Across the U.S., the number of high school graduates is declining, and this varies by region and state. These declines, of course, have different impacts on smaller and larger institutions, but the overall result is increased competition for students and yet another pressure point on schools.

This drop-off, fueled by declining affordability and accessibility, is particularly steep for low-income, high school graduates. Total post-secondary enrollment for this segment fell by nearly 23 percent from 2008 (55.9 percent) to 2013 (45.5 percent). In comparison, enrollment by high-income, high school graduates declined just 4 percent in that same timeframe (81.9 to 78.5 percent).

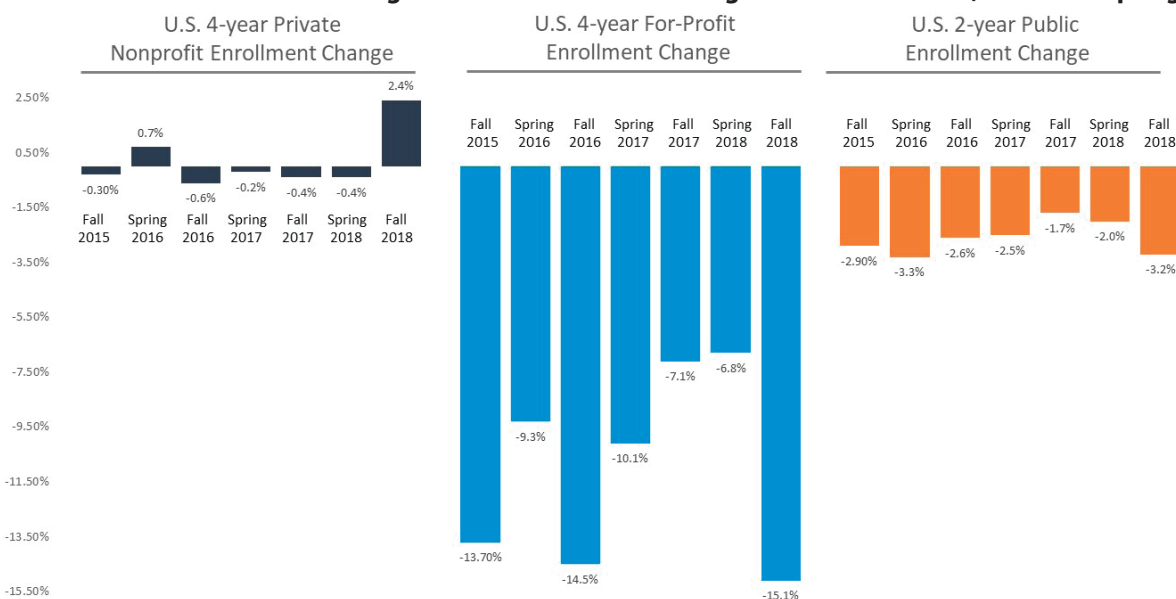
Simultaneously, international student enrollment – a significant source of tuition income for many U.S. institutions – has also been declining (Exhibit 6).

Between 2016 and 2017, U.S. colleges and universities reported a 3 percent decrease year over year in international enrollment. This drop-off is due partly to newfound immigration concerns and partly to rising competition from other nations. For example, between 2008 and 2015, international student enrollment in Canada increased by 98 percent and is expected to rise even further because of the nation's affordable higher education programs and greater political stability compared to other English-speaking countries.

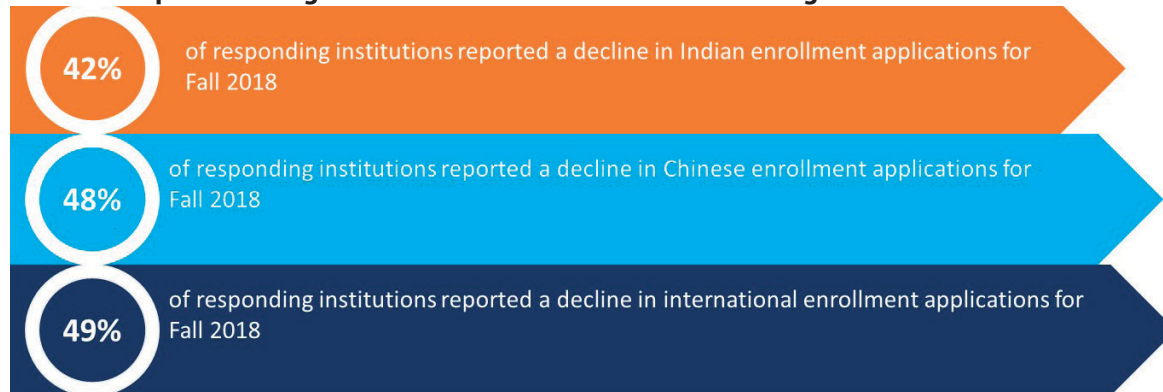
Declining international enrollment – particularly from China, India and Saudi Arabia – could have a significant impact on the financial models of U.S. colleges and universities, with potential loss of around \$250 million in tuition revenue annually.

The combination of rising tuition, deeper debt burdens and an increasingly competitive job market is fueling

**Exhibit 5: Semester to Semester Changes in Enrollment in US Colleges and Universities (Fall 2016 - Spring 2018)**



Source: National Student Clearinghouse Research Center

**Exhibit 6: Reported Changes in International Enrollment in US Colleges and Universities**

Source: Institute of International Education - 2018 OpenDoors Survey

greater scrutiny by students and their families when it comes to assessing the value of a college degree. Today's students expect improved college affordability by way of lower tuition. While schools continue to attempt to control costs, students now expect improved services and campus infrastructure (dorms, classrooms, sports facilities, etc.) These financial and operational challenges confront each and every school. This makes the landscape significantly more competitive for U.S. colleges and universities than it has been in the past. To contend, institutions need to not only demonstrate clear value to students, they need to structure their financial, operational and academic models to maximize resources and attract students while attempting to remain viable and sustainable.

### Sustainable Solutions for Higher Education

All schools are affected in some way by the economic, political and financial changes of the last decade, and no institution is immune to the myriad number of challenges. At this stage, every college and university should have a firm handle on its realistic revenue

streams, a clear understanding of and ability to communicate its unique value proposition and a unified strategy for ensuring maximum efficiency and long-term sustainability to support its core mission. If this is not the case for an individual institution, it must recognize that doing nothing is no longer an option.

In fact, changing an institution of higher education is significantly more challenging than changing a corporation. Regardless of an individual college or university's age, the culture of academia is deeply rooted in centuries-old philosophies and practices. The larger an institution is, the more siloed its organizational structure likely is and the harder it will be to uproot outdated models and achieve systemic change. Nonetheless, it must be done if an institution is to remain competitive and continue to fulfill its mission for the long term.

For too many schools, balance sheets and income statements are trending negatively. Maintaining reasonable levels of liquidity, in many instances, is a significant and ongoing challenge. To remain viable, U.S. colleges and universities need to contain tuition, increase affordability and broaden access by:

- Ensuring all constituents (e.g., board, administration, faculty) embrace the need for change and the urgent need for sustainability
- Diversifying funding sources to address revenue shortfalls
- Investing in and applying appropriate resources to the core business
- Creating multi-faceted, cost-efficient financial, operating and academic models that appropriately align costs while preserving the core mission
- Offering a clear value proposition to students and stakeholders and aligning programs with student demands
- Having the conviction and resolve to make the difficult decisions and implement the necessary changes

#### ABOUT THE AUTHOR



**Robert Hershan**  
Alvarez & Marsal

Mr. Hershan brings more than 30 years of commercial and legal experience and deep expertise in managing complex transactions, with emphasis on problem-solving, structuring and negotiation. Since joining A&M in 2007, Mr. Hershan has facilitated bottom-line and organizational improvement for

clients in manufacturing, transportation, language services and technology solutions, financial services and higher education. In the higher education sector, Mr. Hershan recently led the firm's engagement with a major university in New York City, developing and implementing financial, operational and restructuring strategies for the university, across its four campuses, at both the undergraduate and graduate levels. Mr. Hershan earned his bachelor's degree from the Wharton School of the University of Pennsylvania and his juris doctor from Fordham University School of Law.

Article continued on p. 44

# INSOLVENCY DETECTION USING PUBLICLY-TRADED DEBT AND EQUITY



**J.B. HEATON**  
J.B. Heaton, P.C.

On January 11, 2019, Windstream Holdings, Inc. (WIN) closed in trading with a stock-market capitalization of \$131.8 million. Its total listed short- and long-term unsecured debt as of the last financial statement available exceeded \$1 billion. Among its debt, WIN had a 6.75 percent first-lien bond due April 1, 2028, with outstanding face amount of \$100 million. Bloomberg reported the last trade of January 11, 2019, at 60.036. As shown below, this was sufficient information to know that Windstream was balance-sheet insolvent that day despite its positive stock market capitalization of \$131.8 million. WIN filed for bankruptcy protection on February 25, 2019. Its stock fell from \$3.08 on January 11, 2019, to \$0.45 on February 25, 2019.

The balance-sheet solvency test—whether, as of a given date, the value of a firm's assets is greater than the amounts owed—"is the traditional bankruptcy test of insolvency."<sup>1</sup> It plays substantial roles in both bankruptcy and corporate law. The permissibility of leveraged buyouts and spinoffs depends on whether the resulting entities are solvent, typically requiring solvency opinions before consummation. When such transactions do not work out, the question of whether

the entity was solvent or insolvent at the time the deal was consummated is a key focus of litigation. Creditors may be able to enforce fiduciary duties when a corporation is insolvent, but not when it is solvent. The creditors of an insolvent corporation may be able to seek the appointment of a receiver. Only solvent corporations can legally pay out corporate assets to shareholders in the form of dividends and repurchases. Insolvency also determines what payments to creditors before a bankruptcy filing are voidable preferences under 11 U.S.C. § 547, what transactions without "fair consideration" or "reasonably equivalent value" are voidable under state and federal fraudulent transfer law, and whether shareholders are entitled to form an equity holders' committee in a bankruptcy proceeding. Insolvency is also a "badge of fraud" that can serve as evidence that a transfer of a debtor's property was made with actual intent to hinder, delay, or defraud creditors. These restrictions of bankruptcy law and corporate law are especially important because borrowing firms cannot contract out of these requirements as they can contract out of traditional covenants with so-called "covenant-lite" loans.

In practice, balance-sheet solvency testing is fraught with difficulties. Mechanically, the balance-sheet

<sup>1</sup> *In re Premier Entm't Biloxi LLC*, 445 B.R. 582, 640 (Bankr. S.D. Miss. 2010).

solvency test asks if the market value of assets exceeds the face value of debt.<sup>2</sup> Calculating both amounts—the market value of assets and the face value of debts—can be hard. As for debts, solvency testing usually requires a definition of “debt” identical or similar to that found in the United States Bankruptcy Code’s broad definition of “debt” as “liability on a claim[.]”<sup>3</sup> where a “claim” is a “right to payment, whether or not such right is reduced to judgment, liquidated, unliquidated, fixed, contingent, matured, unmatured, disputed, undisputed, legal, equitable, secured, or unsecured[.]”<sup>4</sup> This includes, for example, liabilities for torts inflicted on others, which alone can force some firms into bankruptcy.<sup>5</sup> These contingent liabilities must be identified and discounted for their probability of occurrence. As for assets, direct market values of assets are rarely if ever available (closed-end funds may be an exception, but these are hardly run-of-the-mill businesses). Analytical valuation tools—including discounted cash flow analysis, comparable company multiples, and comparable transaction analysis—require considerable subjective judgment and can lead to large valuation errors. In no case does a positive accounting book balance in the shareholder’s equity account imply legal solvency, since generally accepted accounting principles do not necessarily reflect fair valuation or an accurate valuation of contingent liabilities. Under certain circumstances, GAAP only requires that certain liabilities be disclosed in the notes to the financials, and in other circumstances, where probability is low (at least in management’s judgment), contingent liabilities may not even be disclosed at all.

Recently, courts have placed greater emphasis on financial-market evidence to overcome these difficulties. While this trend appears to stem as much from skepticism about analytical valuation methods in the hands of paid expert witnesses as on a judicial acceptance of the reliability of market prices, the concept is clear. In theory, the market value of the firm’s assets can be determined by adding the market value of the firm’s debt (including contingent claims) to the market value of the firm’s equity and can then be compared to the face value of the firm’s debt to assess solvency. But much debt that is

on the balance sheet does not trade in the market, and it is often impossible even to identify all the contingent liabilities like pensions, guarantees, insurance liabilities, and obligations to involuntary creditors like tort claimants, all of which should be valued appropriately and included in determining the total face value of “debt.” These problems leave the standard application of market evidence open to criticisms of both under-detecting and over-detecting insolvency.

In recent research, I address these limitations of financial-market-based solvency tests by developing a simple balance-sheet solvency test for publicly traded firms. I derive the solvency test from an elementary algebraic relation among the inputs to the balance-sheet solvency calculation for a publicly traded firm. The solvency test requires only the generally uncontroversial assumption that the market value of assets equals the sum of the market value of the firm’s debt plus the market value of the firm’s equity. The method then generates an upper bound on the total amount of debt the firm can have and still be solvent. The virtue of the method—apart from its ease of implementation—is that it makes possible the detection of balance-sheet insolvent firms notwithstanding the possibility that not all of the firm’s liabilities can be identified. As a result, the method allows for the detection of balance-sheet insolvent firms that otherwise might escape detection. The method proposed here can help identify insolvent firms that should be retaining assets and not paying them out to shareholders as dividends or repurchases, stocks that should be treated by brokers and investment advisers as out-of-the-money call options that may be unsuitable investments or not in the best interest of advised investors, and publicly traded firms that are candidates for going-concern qualifications by auditors or other disclosures.

### The Simple Algebra of Market-Based Solvency Tests

The solvency test developed here requires only a bit of simple algebra. Let  $A_M$  be the market value of the firm’s assets. This value is unobservable for most firms, since their assets are not priced directly in any actively traded market.  $A_M$  is all the firm’s value available for the satisfaction of debt. We let  $D_F$  be the total face value of all the firm’s debt, including all contingent liabilities and off-balance-sheet obligations. Some of this debt will appear accurately on the firm’s financial statements or the notes to those statements, including bank debt and bonds and (in the notes) some off-balance sheet obligations. Some may be reflected, but could be either accurate or inaccurate, like the liability associated with guarantees, pension obligations, insurance contracts, and reserves for litigation liability. Other debt could be missing altogether or disguised.

<sup>2</sup> For example, the United States Bankruptcy Code defines “insolvent” using a balance-sheet solvency test. “Insolvent” is the “financial condition such that the sum of such entity’s debts is greater than all such entity’s property, at a fair valuation[.]” 11 U.S.C. § 101(32)(A) (2018).

<sup>3</sup> *Id.* § 101(12).

<sup>4</sup> *Id.* § 101(5).

<sup>5</sup> Consider, for example, the Form 8-K filed by PG&E Corporation, the California utility, on January 14, 2019, stating that because of potential liabilities for damages from the severe California wildfires in 2018, “the boards of directors of the Corporation and the Utility have determined that commencing reorganization cases under Chapter 11 of the U.S. Bankruptcy Code (‘Chapter 11’) is appropriate, necessary and in the best interests of all stakeholders, including wildfire claimants, PG&E’s other creditors and shareholders, and is ultimately the only viable option to restore PG&E’s financial stability to fund ongoing operations and provide safe service to customers”. PG&E Corporation, Current Report (Form 8-K), January 14, 2019.

To start, we assume that all of the firm's debt  $D_F$  shares the same seniority level (is *pari passu*), an assumption we relax below. Some of this debt may have observable trading prices in the form of secondary-market prices for bonds or bank debt or credit default swaps. In any event, while  $D_F$  is the face or legal value of the claims, we let  $D_M$  be the market value of those claims.  $D_M$  can differ substantially from  $D_F$  because the market value of the debt will reflect the probability of recovery on the debt, not just what the firm has promised or may be liable for.<sup>6</sup> We let  $E_M$  be the market value of the equity of the firm. We are concerned here only with publicly traded firms, so the market value of equity is always observable as the stock price times the number of shares outstanding.

Armed with  $A_M$ ,  $D_F$ ,  $D_M$ , and  $E_M$ , we can set out some basic algebraic relations. First is the definition of balance-sheet insolvency:

$$(1) D_F > A_M$$

That is, using a balance-sheet solvency test, the firm is insolvent when the face value of the firm's debt (that is, the amount *promised* to creditors) is greater than the market value of its assets. We can state this same condition in terms of the market value of the debt,  $D_M$ , and the market value of the equity,  $E_M$ . Assuming that the market value of the assets is the sum of the market value of the debt and the market value of the equity, that is, if  $A_M = D_M + E_M$ , then we can restate the financial condition of insolvency as:

$$(2) D_F > D_M + E_M$$

From inequality (2) it is clear that if we subtract  $D_M$  from both sides, the firm is insolvent if and only if:

$$(3) D_F - D_M > E_M$$

Inequality (3) says that when the firm is insolvent, the "discount" we observe on the debt,  $D_F - D_M$ , that is, the difference between the debt's face or legal value and its market value, will be greater than the market value of the equity.<sup>7</sup>

The practical problem with inequality (3) is that we often cannot identify the full set of debt,  $D_F$ , and therefore we cannot identify  $D_M$  either. But even when we cannot observe  $D_F$  and  $D_M$  in their entirety, we do often observe the ratio  $D_M/D_F$  because that is just the price that debt of the same seniority sells for in the market. We denote  $D_M/D_F$  as  $P$ , the price of \$1 of the firm's debt in the market,

6  $D_M$  can also differ from  $D_F$  if the promised interest rate is higher or lower than the prevailing interest rate. We abstract from this difference here and assume that  $D_M$  reflects the market value after adjusting for interest rate differences.

7 This relationship has been recognized in Delaware case law. See *Quadrant Structured Prod. Co. v. Vertin*, 115 A.3d 535, 562 (Del. Ch. 2015) ("Under the balance sheet test, a company is insolvent 'if the total 'debt discount'—i.e., the difference between the amount of its debt claims and the fair market value of those debts—is greater than the fair market value of its equity.'" (quoting Gregory A. Horowitz, *A Further Comment on the Complexities of Market Evidence in Valuation Litigation*, 68 Bus. Law. 1071, 1077 (2013))).

which we assume is the same for all the debt. We also assume that  $0 \leq P \leq 1$ , that is, we assume here that debt trades at or below par, such that we have already adjusted for any part of  $P$  that is explained simply by marketwide differences in interest rates versus the promised yield on the debt. Since  $D_M = (D_M/D_F) \cdot D_F = P \cdot D_F$ , we can rewrite  $A_M = D_M + E_M$  as

$$(4) A_M = P \cdot D_F + E_M$$

For the firm to be solvent,  $A_M \geq D_F$  (the market value of assets must be at least as great as the face value of the debt) or, in terms of equation (4),

$$(5) P \cdot D_F + E_M \geq D_F$$

which we can rewrite as

$$(6) E_M/(1-P) \geq D_F$$

Inequality (6) gives us an upper bound for the debt of a solvent firm. Even if we cannot observe the firm's actual  $D_F$  directly, the firm is solvent only if  $D_F$  is less than or equal to  $E_M/(1-P)$ , a number we can calculate from the observable market value of equity,  $E_M$ , and the trading price of the firm's debt  $P$ . The upper bound on  $D_F$  is a line with a slope of  $1/(1-P)$  against  $E_M$ . The allowable amount of debt  $D_F$  for a solvent firm increases in the amount of the market value of equity (that is, the larger is the market value of equity for a given price  $P$ , the more debt the firm can have and still be solvent) and increases in the price  $P$  (that is, the closer to face value is the price of debt for a given market value of equity, the more debt the firm can have and still be solvent). Put somewhat differently, for a given level of debt, an increase in the observed price of that debt allows a decrease in the observed market value of equity, and vice versa. We can rewrite inequality (6) as  $E_M/D_F \geq (1-P)$ , which gives a lower bound on the ratio of equity to debt in terms of the price of the firm's debt. The lower is the price, the higher is the right-hand side of  $E_M/D_F \geq (1-P)$ , meaning that the ratio of equity to debt must be higher for the firm to be solvent.

We can also rearrange inequality (6) as:

$$(7) P \geq 1 - E_M/D_F$$

which is a lower bound on the price of the solvent firm's debt. Suppose, for example, that there is no discount and the firm's debt trades at its par value, that is  $A_M = D_M + E_M = D_F + E_M$ . In this case,  $P=1$  and inequality (7)'s solvency condition can be rewritten as  $0 \geq -E_M/D_F$  and the firm is clearly solvent for any values of  $E_M$  and  $D_F$  which are both positive, satisfying the inequality as it must.

Consider a company that has  $E_M = 6.2$  (we can think of this as millions or billions of dollars) and  $P=0.65$ . At those values, the company's total debt  $D_F$  must be less or equal to  $6.2/(1-0.65) = 6.2/0.35 = 17.7$  in face amount. Thus, even though  $A_M$  is unobservable, and

the total  $D_F$  is unobservable, our ability to observe  $E_M$  and  $P_M$  allows us to put an upper bound on the debt this firm can have and still be solvent. If we are able to identify more than 17.7 in debt (including probability-discounted contingent liabilities), then we know that the firm is balance-sheet insolvent. Suppose we can reliably identify 19.6 in face value debt and probability-discounted contingent claims, which may—we are not certain one way or the other—be only a subset of  $D_F$  the total debt. We nevertheless know from inequality (6) that the firm is insolvent because the identified debt exceeds the upper bound of 17.7. We can equivalently calculate that the firm is insolvent because  $P=0.65 < 1-6.2/19.6 = 0.68$ , violating inequality (7). The debt of this firm is trading as an out-of-the-money call option. Although the equity is positive, it does not reflect a solvent firm.<sup>8</sup>

### Applying the Method to Multiple Classes of Debt

In reality, of course, a firm can have debt of different seniority, including senior and junior secured debt and senior and junior unsecured debt of various levels. In this section, we relax the assumption that all debt shares the same seniority level. We now let  $D_F = D_{1,F} + D_{2,F} + D_{3,F} + \dots + D_{j,F}$ , where the  $D_{i,F}$  are the face amounts of different seniorities of debt arranged in order of decreasing seniority with  $i=1$  denoting the most senior debt and  $i=j$  denoting the most junior debt. Correspondingly, we let  $D_M = D_{1,M} + D_{2,M} + D_{3,M} + \dots + D_{j,M}$ , where the  $D_{i,M}$  are the market values of those different seniorities of debt arranged in the same order.<sup>9</sup>

We can now restate equation (4) as

$$(8) \quad A_M = P_1 * D_{1,F} + \dots + P_j * D_{j,F} + E_M$$

Solvency requires  $A_M \geq D_F$ , or,

$$(9) \quad P_1 * D_{1,F} + \dots + P_j * D_{j,F} + E_M \geq D_F$$

which we can rewrite as

$$(10) \quad E_M \geq (1-P_1) * D_{1,F} + \dots + (1-P_j) * D_{j,F}$$

Since all the terms of the form  $(1-P_i) * D_{i,F}$  on the right-hand side of inequality (10) are positive, inequality (10)—a condition for solvency—holds only if for every  $i$  it is also the case that

$$(11) \quad E_M / D_{i,F} \geq (1-P_i)$$

Therefore, if we can observe  $P_i$  and  $D_{i,F}$  for any seniority level and inequality (11) does not hold, we can conclude that the firm is insolvent.

Consider again the company that had  $E_M = 6.2$  and assume the firm has three tiers of debt outstanding, but that only the most junior tier is traded, and it trades at an observed price of  $P_3 = 0.62$ . The face amount of that junior tier,  $D_{3,F}$  is observed to be 17. Since  $6.2/17 = 0.3647 < (1-0.62) = 0.38$ , inequality (11) is violated and the firm is insolvent. Said differently, whatever the amounts of  $D_{1,F}$  and  $D_{2,F}$  (the firm's more senior debt), and the prices of that debt ( $P_1$  and  $P_2$ ), the firm must be insolvent because the minimum price of the firm's most junior debt if the firm is still solvent is higher than the observed price of that debt in the market.

Assuming, as is reasonable, that the price of more junior debt is never strictly greater than the price of more senior debt, we can further tighten the bound by stacking up more junior debt to the debt for which we can observe a price. That is, for observed  $D_{k,F}$  and  $P_k$ ,  $1 < k < j$ ,  $E_M \geq (1-P_1) * D_{1,F} + \dots + (1-P_j) * D_{j,F}$  means that  $E_M \geq (1-P_k) * D_{k,F} + \dots + (1-P_j) * D_{j,F}$  (since all the terms  $(1-P_1) * D_{1,F}, \dots, (1-P_{k-1,F}) * D_{k-1,F}$  are positive) which in turn means that firm solvency requires:

$$(12) \quad E_M \geq (1-P_k) * (D_{k,F} + \dots + D_{j,F})$$

since  $(1-P_k) \leq (1-P_i)$  for all  $i > k$ .

### Examples

#### Frontier Communications Corporation (Ticker: FTR)

On May 24, 2019, FTR closed in trading with a stock-market capitalization of \$186.4 million. Its total listed short- and long-term unsecured debt as of the last financial statement reported on Bloomberg LLC exceeded \$17 billion. FTR is insolvent if for any seniority (including an earlier-maturing pari passu bond),  $E_{FTR} / D_{unsecured,F} < (1-P_{unsecured})$  or  $E_{FTR} < D_{unsecured,F} \times (1-P_{unsecured})$ . Of FTR's outstanding debt, one issue is of 8 ¾ senior unsecured bonds maturing April 15, 2022 with outstanding amount of \$500,000,000. The last trade reported as of May 24, 2019 was a trade on May 22, 2019 at 66.00. Another issue is of 6 ¼ senior unsecured bonds maturing September 15, 2021 with outstanding amount of \$219,721,000. The last trade reported as of May 24, 2019 was a trade on May 22, 2019 at 75.00. Since  $\$186.4 \text{ million} < \$500 \text{ million} \times (1-0.66) + \$220 \text{ million} \times (1-0.75) = \$225 \text{ million}$ , FTR is insolvent.

#### J.C. Penney Company Inc. (Ticker: JCP)

On May 24, 2019, JCP closed in trading with a stock-market capitalization of \$295.5 million. Its total listed short- and long-term unsecured debt as of the last financial statement reported on Bloomberg LLC exceeded \$5 billion. Of JCP's outstanding debt, one issue is of 5 7/8 first lien bonds due July 1, 2023 with outstanding amount of \$1,000,000,000. The last trade reported as of May 24, 2019 was a trade on May 22, 2019 at 83.5. Another issue is of 5.65 senior unsecured bonds maturing June 1, 2020 with outstanding amount

<sup>8</sup> For a discussion of equity as an out-of-the-money call in the context of solvency testing, see J.B. Heaton, *Positive Equity Prices with Insolvency Under Legal Solvency Tests*, 23 J. Forensic Econ. 63 (2018).

<sup>9</sup> Note that "junior" and "senior" can, in practice, be more nuanced than whether the debt is senior secured, second lien, or first lien. Debt that matures earlier is, in the sense used here, more senior if the market assigns a greater probability of nonpayment to longer-maturity debt. Similarly, debt that has a guarantee from a financial guarantor will act like more senior debt than debt that is not guaranteed, so long as the guarantee has some value.

of \$110,006,000. The last trade reported as of May 24, 2019 was a trade on May 22, 2019 at 86.625. Another issue is of 6 ¼ senior unsecured bonds maturing September 15, 2021 with outstanding amount of \$219,721,000. The last trade reported as of May 24, 2019 was a trade on May 22, 2019 at 75.00. Another issue is 6 3/8 senior unsecured bonds maturing October 15, 2036 with outstanding amount of \$388,262,000. The last quote as of May 24, 2019 was at 31.5. Since  $\$295.5 \text{ million} < \$1 \text{ billion} \times (1 - 0.835) + \$110 \text{ million} \times (1 - 0.86625) + \$220 \text{ million} \times (1 - 0.75) + \$388 \text{ million} \times (1 - 0.315) = \$500.5 \text{ million}$ , JCP is insolvent.

## Conclusion

That solvency testing is difficult is nothing new. Commentators in a 1929 Columbia Law Review article lamented that "courts have not yet developed any clear-cut principles or rules" for solvency testing.<sup>10</sup> Seventy-five years later, Delaware's Court of Chancery complained that "it is not always easy to determine whether a company even meets the test for solvency."<sup>11</sup> More than a decade after that, courts still struggle to detect insolvency reliably. This article presents a simple method of detecting balance-sheet insolvency at a publicly traded firm. The method provides guidance for using financial-market evidence, even when it is incomplete in some respects.

10 James C. Bonbright & Charles Pickett, *Valuation to Determine Solvency Under the Bankruptcy Act*, 29 Colum. L. Rev. 582, 620 (1929).

11 Prod. Res. Grp., L.L.C. v. NCT Grp., Inc., 863 A.2d 772, 790 n.56 (Del. Ch. 2004).

## ABOUT THE AUTHOR



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J.B. Heaton received his J.D., M.B.A. and Ph.D. (financial economics) from the University of Chicago in 1999. He is the founder of J.B. Heaton, P.C. in Chicago (<https://jbheaton.com>) where he consults on finance and law based on his research (including on solvency tests) which has been cited by state and federal courts throughout the United States and scholars throughout the world. Prior to starting his own firm, J.B. was a partner at Bartlit Beck LLP from 2004 to 2017 focused on financial litigation and high-stakes damages.

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- 3:00 – 3:05pm Welcome and Opening Remarks
- 3:05 – 3:45pm Executive Compensation
- 3:45 – 4:30pm Keynote Presentation
- 4:30 – 4:40pm Break
- 4:40 – 5:30pm Corporate Restructuring
- 5:30 – 5:40pm Break
- 5:40 – 6:30pm M&A
- 6:30 – 7:30pm Networking Reception

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# USE OF MONTE CARLO SIMULATIONS IN VALUATION



**NEIL BEATON and JOHN SAWYER**

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## Introduction

Valuation professionals are constantly presented with challenging client needs, such as valuing new, and often exotic, securities with a variety of features that defy commonly-used valuation techniques. Monte Carlo simulations, however, can help bridge the gap between ordinary and extraordinary valuation assignments. The Monte Carlo analysis arose out of computer simulations created to address equilibrium properties for specific experiments. Prior to the advent of computers, the outcome of an experiment could be predicted in only one way: by making use of a theory that provided an approximate description of the system under consideration. An approximate theory was used because very few model systems could compute exact equilibrium properties. As a result, most properties of real materials were predicted on the basis of approximate theories. However, approximate theories required one to execute an experiment and then compare the results with the thesis. This was suboptimal because such experimentation was often expensive, and feedback took so much time to gather. With the advent of computer simulation, researchers were able to obtain very accurate results for a given model system without having to rely on approximate theories. It is from this original work that Monte Carlo has found its way into the world of valuation.

## Pulling Back the Curtain

Often Monte Carlo is seen as a more sophisticated method for valuing an asset or liability with a level of complexity that traditional valuation approaches or methods seemingly are unable to capture. However, the first step in implementing Monte Carlo is to understand that it is NOT a distinct valuation approach or method and does not provide a solution to valuing any asset or liability unless the underlying economics are understood

and input correctly. Rather than being a valuation approach or method, Monte Carlo is a technique for performing a set of calculations for the general purpose of understanding/measuring the impact of one or more, often uncertain, variables on the outcome of those calculations, which may represent either a final output or an input into further calculations.

In the implementation of a Monte Carlo simulation, certain distribution and/or correlation assumptions are applied to one or more variables of a calculation. Then, hundreds or thousands of trials are conducted in which a different combination of input variables is selected based on the distribution and/or correlation assumptions. The outcomes are recorded for each trial, enabling a statistical analysis of all the trials of the simulation.

For example, a company's potential future cash flow could be analyzed by applying certain distribution and correlation assumptions to the variables impacting its financial performance, such as product price, quantity sold, fixed and variable costs, etc. Taken a step further, an appraiser could introduce discounted cash flow calculations into the simulation to measure the uncertainty of the cash flows and/or derive a value of the subject company.

While a Monte Carlo simulation is an extremely powerful tool for measuring and obtaining insight into uncertainty, the above example can also be illustrative of the limitations of this technique.

First, the statistics (outputs) produced by the simulation are meaningless if the distributions and correlations of the variables (inputs) are not well supported. Garbage in, garbage out, as the proverb goes.

Second, the Monte Carlo simulation and the resulting statistics may provide a false sense of accuracy or

ability to capture risk and potentially not be any more insightful than a simple data table or scenario-based analysis (both easily accomplished with tools available in a standard spreadsheet application).

Finally, the mean statistics (typically utilized for estimating the value of an asset or liability) produced for any given outcome/result may not be meaningfully different than would be produced by using static calculations based on the mean of the underlying inputs/variables. This is particularly true when the outcome/result varies linearly without any upper or lower bounds. Thus, a Monte Carlo simulation may not be as beneficial for certain calculations, particularly when considering the relatively complex and time-intensive nature of implementation.

The situations in which Monte Carlo is most useful – and often required – are when attempting to analyze/ value an asset or liability with outcomes that are path-dependent, contingent, conditional, and/or non-linear (e.g., fixed outcomes conditional on a variable underlying metric, outcomes with minimums or maximums, etc.). A brief description of each condition follows.

Path-dependent outcomes are dependent on the measurement of certain results or performance over time. For example, a restricted stock award may vest only when the underlying stock price reaches a defined threshold during a defined period; thus, the stock prices through time and not just at maturity dictate the value of the award.

Contingent and/or conditional outcomes are dependent on the occurrence of certain circumstances or results. For example, an acquiring company may offer a fixed earn-out payment to a target company based on the future achievement of a minimum earnings target.

Non-linear outcomes are those in which the outcome is not proportional to the underlying asset/liability. For example, a typical stock option only provides a positive payoff if the underlying stock price exceeds the exercise price at maturity and results in zero value in all other scenarios – the payoff is non-linear with respect to the underlying stock price.

These conditions are most often encountered in the valuation of equity or debt derivatives (such as restricted stock, options, and warrants with anti-dilution provisions) and other complex financial instruments in which the outcomes or payoffs generally meet one or more of these criteria. Occasionally, a Monte Carlo simulation is employed even in the absence of these conditions, when implementation into a standard closed-form solution, such as a binomial lattice model, may be too complex and difficult with standard spreadsheet software.

In short, Monte Carlo should not be considered a magical solution to valuing an asset or liability. The variables determining the outcome or payoffs need to be understood; then it should be determined whether

the outcome or payoff has any path-dependent, contingent, conditional, or non-linear outcomes that cannot be properly measured using closed-form or other mathematical solutions. Once these questions have been answered, it may then be appropriate to consider a Monte Carlo simulation to address the problem at hand.

## Understanding Key Statistics and Conducting Diagnostics

After understanding when and how to apply Monte Carlo simulations for valuation purposes, it is important to be able to interpret the resulting statistics of the simulation and conduct diagnostics using those statistics to ensure the simulation is performing as expected.

During the preparation of the analysis/model to be used in the Monte Carlo simulation, the user should have some expectations of the performance of the simulation and results, and then identify and design diagnostics that will facilitate a statistical analysis of the results.

In understanding statistics for any Monte Carlo simulation, it should be reiterated that within the simulation, each trial is of equal weight (if a certain outcome is more probable than others, then that outcome will occur in more trials than others). Thus, the statistical analysis is performed on the entire dataset of the outcomes from all trials within the simulation with each outcome given equal weight.

The following is a description and summary of how to interpret some key statistics that may be relevant when performing a Monte Carlo simulation:

**Mean** – The mean of the results, in most cases, is the conclusion to derive the input into another calculation (i.e., discrete cash flow when simulating financial statements) or the estimate of value; therefore, the mean is the most critical statistic for valuation purposes (but not the only).

**Median** – In certain instances, the median may be considered a more meaningful indication of the “average” of a distribution than the mean, given that it is less skewed by outliers. In the context of a Monte Carlo simulation, the median can be helpful in understanding the distribution of the results. As an example, in a unimodal distribution if the mean is less than the median, this indicates that the mean is not in the middle of the distribution, but instead the distribution is skewed to the left. Additionally, certain accounting guidance, such as determining the average time to vesting for market-based stock awards, may require the use of the median for a particular outcome.

**Minimum/Maximum** – The minimum and maximum are helpful to understand the potential range of outcomes as well as to ensure the simulation is not producing illogical results (e.g., the value of a restricted stock

award or option should never result in a negative value or a security with a fixed payoff should not have results exceeding the fixed amount).

**Standard Deviation** – The standard deviation is helpful to understanding the general distribution of the results; a larger standard deviation indicates a wider distribution of results. The expectation regarding the standard deviation of any outcome should be consistent with the underlying assumptions (e.g., higher expected volatility of stock price should correspond with a higher standard deviation of outcomes) and complexity of payoff structure, vesting, etc.

**Kurtosis** – The kurtosis is the measure of the extent the distribution of the results is peaked or flat. The notable value is 3.0, which indicates a standard normal distribution. A kurtosis higher than 3.0 indicates the results are peaked and concentrated at the mean and less than 3.0 indicates the results are relatively flat at the mean.

**Skewness** – The skewness statistic provides a numerical representation of what any observer of a distribution chart would be able to note. A skewness of 0 indicates a symmetrical distribution of results, while a positive value indicates a log-normal or skewed to the left distribution.

While it may be tempting to prepare the Monte Carlo simulation and just pull the mean from the results to derive the estimate of value without further analysis, it has been our experience that a more detailed review of the statistics and advanced consideration of potential diagnostics can provide assurances that the simulation is performing as expected and allow an analyst to provide insightful explanations of the results that may be invaluable when discussing with stakeholders.

### An Example of Application

As is the case with most new concepts, an example is often helpful to fully understand and apply the concept - certainly Monte Carlo simulations are no different. Thus, we are using the valuation of a relative total shareholder return restricted stock award (commonly referred to as an "rTSR") to illustrate how to implement and interpret the results of a Monte Carlo simulation.

In our example, the rTSR award's vesting will be based on the subject company's stock price relative to a group of four peer companies. The vesting percentage is based on rank of return (calculated using the 20-trading day average prior to the grant date and preceding the maturity date) over the measurement period (two years), as follows:

- Rank 1st – 200 percent of shares
- Rank 2nd – 150 percent of shares
- Rank 3rd – 100 percent of shares
- Rank 4th – 50 percent of shares
- Rank 5th – 0 percent of shares

The above vesting conditions contain both conditional (rank of return) and non-linear (shares vesting dependent on rank and the value of the award is not linear with stock price) outcomes; thus, as detailed previously, the valuation of the rTSR award requires a Monte Carlo simulation.

In order to value the rTSR award, simulating the stock price of the subject company and the four peer companies is required. The most common and widely accepted method for doing so is the geometric Brownian Motion (GBM). GBM utilizes a beginning stock price ( $S_0$ ), risk-free rate ( $\mu$ ), expected volatility of underlying stock ( $\sigma$ ), and simulated variable ( $\epsilon$ , a random number that has a normal distribution with a mean of zero and standard deviation of one) as inputs to the following formula to simulate each company's stock price:

The simulation can either be done using daily time-steps or, more efficiently, using a one-time jump to the beginning of the 20-day period at the maturity then using daily time-steps ( $t$  is the time interval of the time-step).

One additional element to consider is the correlation between the subject company's and each peer company's stock price as these types of awards often use companies within the same industry and some level of positive correlation would be expected. Based on our experience, correlation can have a meaningful impact on the results of an rTSR award and thus we incorporate the correlation in our analysis. The correlation of the simulated stock prices for each company are addressed by applying a correlation matrix to the simulated variable ( $\epsilon$ ) for each company for each time-step. This is typically calculated based on the historical correlation of daily stock price returns between the subject company and each of the peer companies, and between each peer company and all the other peer companies.

A Monte Carlo simulation consists of a large number (hundreds of thousands are typically necessary to capture the potential variability of the outcomes) of "trials" in which a new set of simulated variables ( $\epsilon$  in our example) are selected based on defined distributions (a normal distribution is a frequently utilized distribution; however, there are many available distributions, such as log-normal, bi-modal, triangular, uniform, etc., that may be more appropriate for any specific simulated variable).

In our example, one trial would consist of a stock price path between the valuation date and the maturity (two years) for the subject company and each peer company, representing one potential outcome or scenario. In each trial, the return – based on the 20-trading day average preceding issuance and the simulated 20-trading day average preceding the maturity – and rank for each company would be calculated and used to determine the number of shares of the rTSR award vesting, and then the future value (shares vested multiplied by the

future stock price) and present value (future value of rTSR award discounted at the risk-free rate) of the award would be determined.

At least one metric should be identified then tracked and recorded for each trial, enabling a review and interpretation of the results of the Monte Carlo simulation using statistical analysis. Often, we will track several metrics within the analysis to allow us to evaluate whether the simulation is performing as expected and further understand how various assumptions/factors might be impacting the results. For example, we might track the number of shares of the subject rTSR award vesting in each trial to ensure the minimum is not less than zero and maximum is not greater than 200 percent of the total award and understand the frequency/probability of reaching each vesting threshold (tracking the rank for each company would provide some insight here as well).

In addition to analyzing the results of a key outcome(s) to derive the intended value estimate, the statistical analysis can be leveraged for other outcomes within the simulation to interpret the performance of calculations and understand the results. Leveraging the example of the application of a Monte Carlo simulation for the valuation of an rTSR award, we can provide several examples of diagnostics that could be conducted for such an analysis.

One outcome of the rTSR simulation that would be of interest to analyze is the number of shares vesting and/or the rank of the subject company's stock price return. A simple solution would be to track the rank and/or number of shares vesting in each trial; however, the statistical analysis of the rank or number of shares vesting would not necessarily provide a clear understanding of the frequency of the various vesting thresholds (i.e., rank of return) being achieved. Alternatively, a secondary calculation could be performed which would result in a value of 1 when a certain rank is achieved and 0 if not; the resulting mean of all trials would provide the probability of that rank being achieved.

Another diagnostic that is often helpful to perform when preparing a valuation of an equity security or derivative using a risk-neutral framework (i.e., geometric Brownian Motion) is to calculate the present value (discounted at the risk-free rate) of the payoff of a standard European stock option (maximum of 0 and future stock price less exercise price) then compare the mean of the results to the value indicated by a standard Black-Scholes-Merton option pricing model with the same assumptions, which would provide some reassurances that the simulation of the stock price is behaving as expected and/or a sufficient number of trials has been selected. Alternatively, the behavior of the stock price simulation can be assessed by comparing the mean of the results of the present value of the future stock price at maturity in each trial

to the beginning stock price; the theoretical difference should be zero.

In the subject example, the key metric to track would be the resulting present value of the rTSR award for each trial as the mean of all the trials would represent the conclusion of the fair value or fair market value of the rTSR award (each trial is equally likely and, therefore, given equal weight). Additionally, it might be necessary to track the time to vesting for awards with variable maturities to capture the median term for certain accounting disclosures under financial reporting.

In conclusion, Monte Carlo simulations can be useful and powerful tools for the valuation analyst tackling complex problems that don't lend themselves to commonly-used valuation techniques. Once the Monte Carlo framework is understood, relevant inputs can be identified and simulated to provide statistically valid results that can enhance most valuation assignments.

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# CRITICAL ISSUES IN FRAUD INVESTIGATIONS

## PART II – FRAUD DETECTION AND INVESTIGATION



DAVID BART, CIRA, CDBV and ANDREW DAVIS, CPA  
RSM US LLP

### Introduction

All organizations face the risk of fraud. Understanding the sources of risk from fraud and the methods for its detection can help effectively identify and manage each unique investigation into fraudulent activity. Those investigations may be part of a general bankruptcy inquiry into losses of cash or assets, or they may be part of an investigation into theft(s) perpetrated by insiders. They may also be part of an investigation into poor internal controls that will need revision as a company reorganizes.

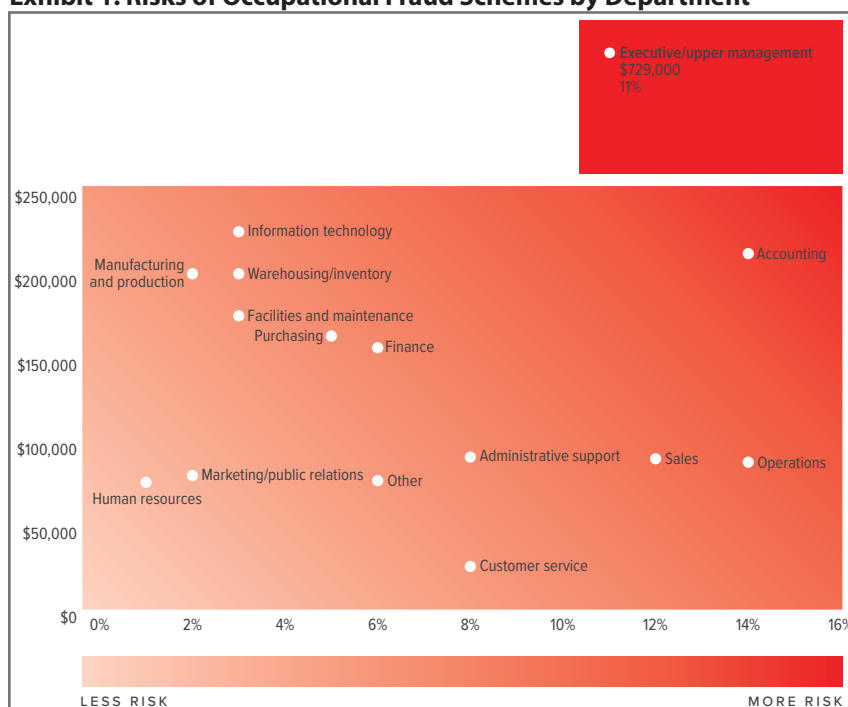
This two-part article discusses some basic concepts surrounding potential risk from fraudulent activities and common means of investigating allegations. Part I identified major types of fraud, their frequency of occurrence, and median sizes of loss. Part II focuses on fraud detection, methods used to investigate allegations of fraud, and summarizes key lessons and observations from past experience.

### Locations of Fraud

As noted in Part I, the location of fraud schemes within companies varies by department. Matching the percent of cases against the median size of loss can help highlight areas of greater risk. The 2018 *Report to the Nations* issued by the Association of Certified Fraud Examiners (ACFE) reported the analysis of 2,690 cases of occupational fraud in 125 countries occurring between January 2016 and October

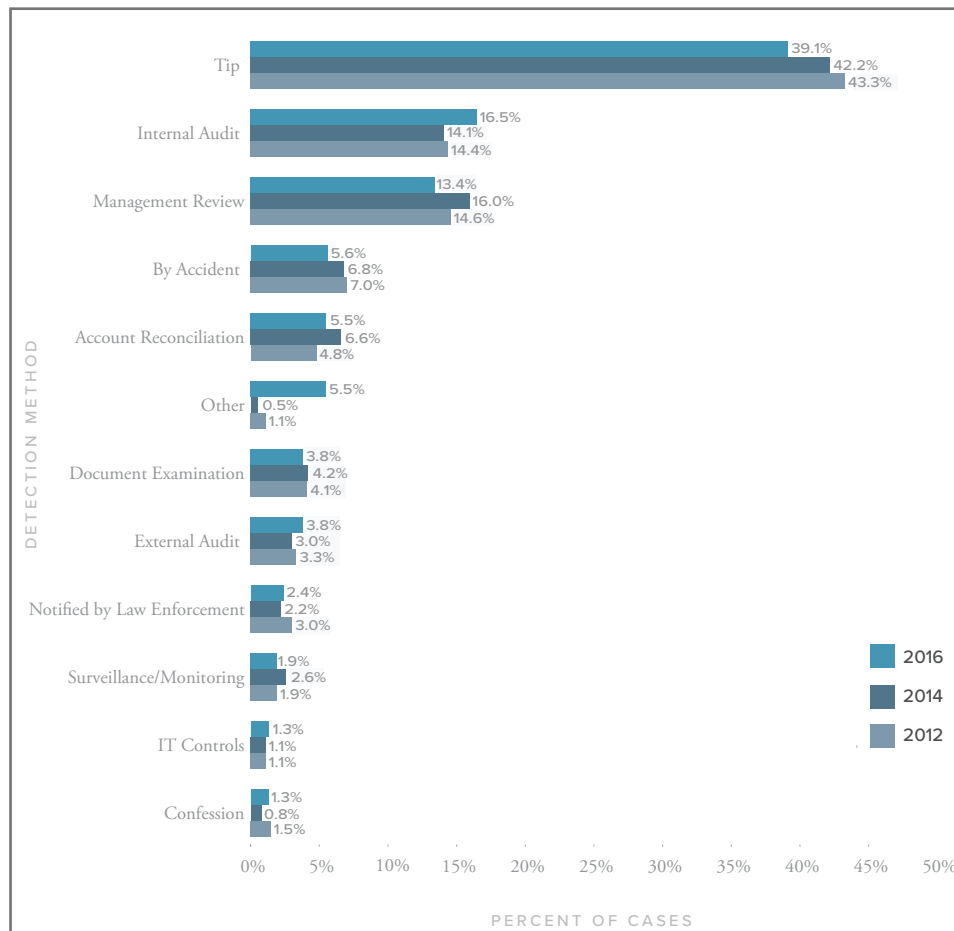
2017. The study found that accounting and operating departments together with executive management posed the greatest risks relative to the median loss per occurrence versus the frequency rates. Median losses in accounting schemes were \$212 thousand and median losses for operations were \$88 thousand, with each accounting for 14% of cases. Losses on executive/man agent schemes were \$729 thousand with an 11% occurrence rate (See Exhibit 1).

**Exhibit 1: Risks of Occupational Fraud Schemes by Department**



Source: ACFE 2018 *Report to the Nations*, Fig. 28.

## Exhibit 2: Fraud Detection and Notification



Source: ACFE 2016 Report to the Nations, Fig. 21

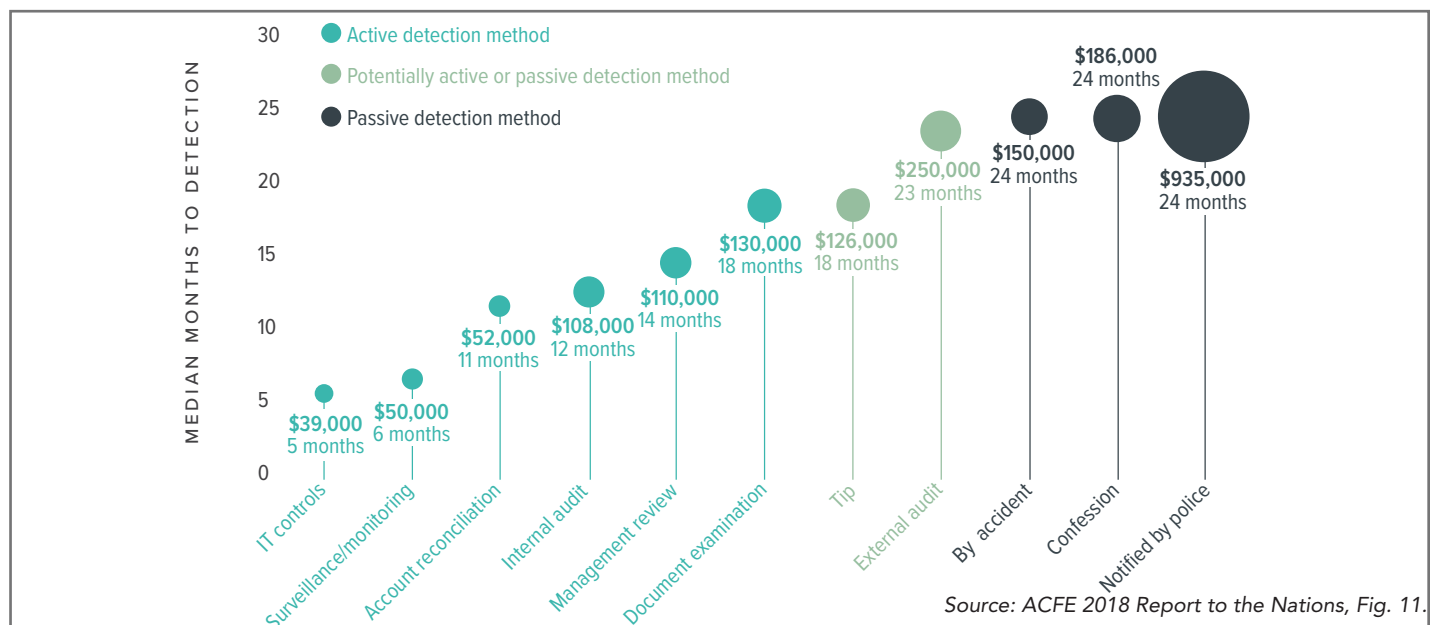
How are these detected? Most frauds are detected by tips. The 2016 ACFE Report to the Nations compared trends from 2012, 2014 and 2016. Most tips come from employees who revealed 51.5% of occurrences, and non-insiders revealed more than 40% of occurrences. Most tips, nearly 47%, were received on hotlines. In

fact, organizations with hotlines cut the size of loss and median time to detection by 50%. Results were similar in the 2018 Report to the Nations. (See Exhibit 2)

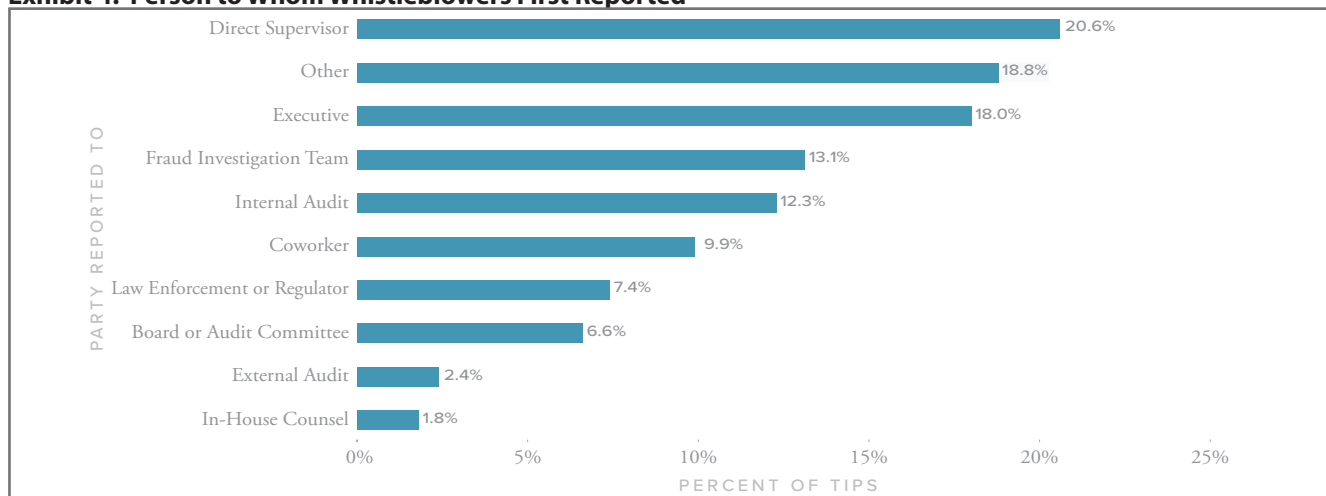
ACFE also found a correlation between the means of detection and the severity of the fraud. ACFE concluded that passive detection through accident, confession or police notification accounted for the longest duration frauds, while active means such as IT controls, monitoring, account reconciliation, internal audit, management review, and document examinations reduced the duration of the frauds by up to 80%, from 24 months down to 5 months. Detection through external audits and tips occurred on longer duration frauds, ranging from 23 months down to 18 months, respectively. These results indicate that active controls and management environment can help to significantly reduce the duration of frauds (See Exhibit 3).

Whistleblowers are the key to detection and the key to future investigation of allegations. Whistleblower reporting varies by department and by mechanism used to do the reporting. The 2016 Report to the Nations provided a comparison that indicated the direct supervisor was the most important person for reporting. (See Exhibit 4)

## Exhibit 3: Duration of Fraud to Detection



Source: ACFE 2018 Report to the Nations, Fig. 11.

**Exhibit 4: Person to Whom Whistleblowers First Reported**

Source: ACFE 2016 Report to the Nations, Fig. 36.

The ACFE 2018 *Report to the Nations* stated that whistleblowers used a variety of mechanisms to report their allegations (Exhibit 5). The most important mechanism by far was the telephone hotline, with email and web-based online forms used 35-40% less frequently than telephone hotlines.

**Exhibit 5: Mechanisms for Reporting Fraud**

Telephone Hotline	42%
Email	26%
Web-based Online Form	23%
Mailed Letter or Form	16%
Other	9%
Fax	1%

While employees accounted for 53% of all reporting of occupational fraud, customers and vendors accounted for 29% of reported cases. This implies that open and honest relationships with outside observers of the company are critical. Overall, whistleblowers must be encouraged to come forward. This requires management to create an environment that fosters overall honesty by protecting whistleblowers. This type of environment can foster a sense that employees, customers, and vendors have a stake in the business, have an interest in honest operations, and should bring their concerns to management, either through company hotlines or through direct personal reporting.

**Rising Incidence Rates**

Overall, the incidence rates and types of fraud are increasing. Kroll's *Global Fraud and Risk Report for 2017/2018* noted the heightened incidence and substantial repercussions of fraud (Exhibit 6).

**Exhibit 6: Percent of Respondents Reporting Fraud Incidents Within the Past Year**

2017	84%
2016	82%
2015	75%
2014	70%
2013	70%
2012	61%

Kroll reported that 86% of the executives surveyed indicated a growth in cyber-crime incidents, and 70% reported at least one incident involved security breaches. The size of fraud crimes have increased as well. Kroll's 2017 survey results indicated that 31% of occurrences involved a magnitude ranging from 4-6% of revenues, and 18% of occurrences involved 7-10% of revenues. Nearly two-thirds of executives indicated that the frauds damaged the company's reputation.

**Red Flags**

Observers of fraudulent activity can spot a number of red flags that provide initial clues. Based on the ACFE's analysis, living beyond one's means is the most common red flag, present in 41% of cases. The existence of personal financial difficulties appears in 29% of the cases. In 45% of cases, perpetrators also engaged in non-fraud related misconduct such as bullying or intimidation (21%), excessive absenteeism (14%), and excessive tardiness (10%). These red flags often occur in conjunction with opportunities to commit fraud schemes. Many key warning signs drawn from a wide variety of cases offer a range of examples. Observation of these or other occurrences should warrant immediate follow-up and further investigation. Some of these situations include:

- Erratic documentation and record keeping
- Checks made out to "cash" that are greater than petty cash allotments

- Missing checks / check numbers out of sequence
- Irregularities in bidding processes
- Changes in business practices
- Invoices for unspecified consulting or other poorly defined services
- Vendor anomalies
- A lack of segregated duties and responsibilities
- Weak restrictions on authorization authority including execution of operations, custody of assets, and record keeping of transactions
- Lack of internal controls related to cash receipts and disbursements, accounts receivable and sales, inventory and cost of sales, accounts payable, other liabilities, purchases and payroll
- Weak confidentiality restrictions, such as permitting employees to take home confidential documents; employees are not required to sign a non-disclosure agreement; and contracting with companies owned or controlled by an employee.

ACFE concluded that 85% of cases involved fraudsters who displayed at least one behavioral red flag, and 50% of cases involved fraudsters who displayed multiple red flags. The top six red flags were: (1) living beyond means, (2) presence of financial difficulties, (3) unusually close association with a vendor or customer, (4) display of control issues and an unwillingness to share duties, (5) presence of divorce or family issues, and (6) display of a wheeler/dealer attitude.

### Developing the Investigation

Responses to allegations will vary depending on the facts, and each investigation is unique. A number of questions can be gleaned from the whistleblower's descriptions. That information can help determine critical questions, key management issues, and key concerns that should be communicated to employees and others. Some initial questions to consider include:

- What is the initial assessment? How specific are the allegations? How serious?
- Does the alleged activity constitute fraud?
- Who is involved?
- How should those who were involved in the fraud be handled?
- Are there any co-conspirators?
- How much was lost to fraud?
- During what period did the fraud occur?
- How did the fraud occur?
- How was the fraud identified?
- Could the fraud have been detected earlier?
- What can be done to prevent similar frauds?

- Should the conduct be disclosed to the authorities?

A number of critical management concerns should be considered, including:

- Who decides when an allegation should be escalated to a formal investigation?
- Who should be notified?
- Who will lead and manage the investigation?
- Document the criteria and rationale utilized to make such determinations
- Define clear protocols for investigator assignments and supervisory assignments
- Define roles for outside services – offer guidance and independence, structure, consistent approaches
- Document the analyses and findings
- Involvement of legal counsel

Key communications should also involve careful consideration, such as:

- Who should be notified (senior management, board, board committees)?
- Develop effective and consistent communications protocols between the Investigations group, leadership, and stakeholders
- Determine the types of communications (written, oral) required for assessment
- Determine how to protect findings and communications (legal privilege)
- Determine appropriate notification of corporate management, audit committee, other departments, internal audit, regulators and law enforcement

### Running the Investigation

Many factors will play into the scale and scope of an investigation. Consideration should be given to the investigating team, the overall process, response times, overall and detailed approaches and methods, and whether to use outside professionals.

**The Team** — Selection and coordination of an investigating team is critical. Materials published by the AICPA, ACFE and others point to leading themes in managing the initial steps of an investigation.<sup>1</sup> First, identify who should know about and who should investigate the allegations. Consider keeping the team smaller and focused on effectiveness. Recommendations include notifying general counsel, human resources, and other oversight departments.

<sup>1</sup> For example: *The Guide to Investigating Business Fraud*, AICPA, 2009. *White Collar Crime: Core Concepts For Consultants and Expert Witnesses*, AICPA, 2012. Also, ACFE's Certified Fraud Examiner training materials and website resources.

Secure documents and electronic information. Consider retaining outside counsel to lead the investigation, both for confidentiality reasons as well as maintaining independence and objectivity. Consider using other professionals (computer forensics and forensic accountants) to obtain their independence, objectivity, skills, and time. Employees should be notified not to have any contact with alleged perpetrators, if appropriate. Consider whether/when to notify law enforcement and regulators. Insurance coverage needs to be reviewed to see if the fraud, or error, is a covered act.

**The Process** — Investigations are active enterprises requiring flexibility, engaged management, and appropriate oversight. Therefore, define and maintain confidentiality of the investigation. Creation of an evolving work plan that responds to findings and questions can enable the investigation to be dynamic and responsive as it uncovers new facts. Scoping and re-scoping the work depending on the issues may involve research into business unit records, external records, geographic considerations, potential legal considerations, and identification of potential interviewees. Carefully document and safeguard the evidence to preserve it for admissibility in potential litigation. Use of competent and analytical investigators and interviewers who understand evidence development and preservation should help ensure that the fraud can be successfully prosecuted. Conduct interviews in a consistent manner to maximize the information and establish equal professional treatment of interviewees. And, obtain all necessary approvals and authorizations.

Investigations will require tight management, so use effective case management techniques. Develop metrics to measure scope and progress. Define and review case status and preliminary findings on a regular basis. Document status meeting results, next steps, and action items. Carefully manage case files ensuring they are current and complete. Thoroughly develop facts while maintaining confidentiality. Carefully document and safeguard the work of the investigators for use in regulatory matters and for uses in potential litigation. Develop notification protocols and meetings.

**Response Times and Record Keeping** — Frequently, response times are critical to preserve evidence, so be proactive about managing the investigation. Identify perpetrators, stakeholders, and perform an initial assessment of loss. Decide whether the initial disclosed act results from a disgruntled employee, is a single act, or represents a broader systemic risk. Secure records (paper and IT) to avoid spoliation, and consider using a custodian. Evaluate whether the allegation has merit and document the decisions made. Evaluate and prepare for any risk of physical violence. Decide on the range of initial interviews and confidentiality. And, maintain a proper chain of custody for evidence, which is essential in case the matter ends up in civil or criminal prosecution.

Response times are critical to preserve evidence. Proactive management of the investigation and responses should help limit the damage. Determine resource commitments and the use of outside professionals. Define roles and responsibilities of investigation team. Establish communication protocols for the investigation. Protect the investigation with legal privilege. Develop an understanding of whether the issue will involve regulators and/or law enforcement. Evaluate reporting/disclosure requirements and notification timing deadlines. Anticipate key decisions and re-anticipate those decisions. And, identify realistic operating constraints such as budget, scope, time frame, and resources for the investigation.

**Approaches** — Consider using timelines and flowcharts to identify and track: key dates, key parties and relationships, key people including tracking changes in position and departures, organizational relationships, flows of funds or other transactions, documents and transaction approvals. As timelines are developed, they can serve as a guide for discussion, stimulating the development of information and helping to determine an evolving scope of investigation.

Overall, a creative investigation should offer a scientific approach to develop facts and cross check findings. Investigations should be iterative and actively performed to develop a solid basis for findings.

Remember, forensics seeks to document the issues. Therefore, it is critical to see and document both sides of transactions, transaction approvals, and postings for debits and credits. Obtain treasury records to show receipts and disbursements, and banking documents to show actual deposits/receipts versus company records. Documentation of formal policies, procedures and guidelines should be tested against informal methods used by employees. Obtain policy manuals and memos. Perform tests and request examples to see the actual document flow. Learn about and obtain IT records to identify online methods, including how online postings are made for transaction approvals. Document formal posting and approval authority and test actual transactions. Fraud texts suggest that all electronic evidence must be quickly gathered and preserved and all relevant documents need to be gathered and preserved.

**Use of Outside Professionals** — Outside professionals offer independence and objectivity and expanded skill sets. They can assist the company or counsel through providing investigative skills and services as a neutral party when conducting interviews and analyses. They can work with counsel in investigating and pursuing claims. They can assist the investigation by providing critical methods (such as data analytics and access to accounting and financial research), while applying an outsider's perspective. Use of creative approaches and data accumulation frequently supports the search for patterns. They may prepare expert reports and

rebuttal reports that include findings and opinions based on the application of relevant accounting rules and regulations and relevant analytical techniques. Outside consultants and experts can identify key issues, questions and documents for deposition preparation as well as providing expert testimony on liability and damages and assisting counsel in the cross-examination of other experts.

### Critical Lessons

Generally, the investigation and findings need to address the following:

- Is the allegation credible? Is it possible that the issue might be larger than first thought?
- Who is the subject of the allegation, what is their relationship to the company, and did they act with fraudulent intent? What was the purpose of the activity related to the allegation?
- How serious is the allegation and the potential/actual magnitude of loss/damage?
- Who and what levels of employees are alleged and actually involved in the misconduct (i.e., officers, directors, or managers)?
- Did any third parties receive any direct or indirect benefit, who are they, and what was the value? Was the third party a government official?
- How was the matter recorded on the company's books and records?
- Were there whistleblowers, and, if so, how should they, or how were they, dealt with?
- What measures were undertaken to document how the initial evidence of wrongdoing was handled, the investigation findings, and subsequent actions?
- Who requires notification; and, will/is the government involved?

The most important lessons gleaned from performing investigations can be summarized as learning objectives:

- Learn to listen
- Learn to be analytical
- Learn to adapt the investigation
- Learn to be responsive
- Learn to be proactive
- Think carefully about critical Insights.

Clients sometimes need to be reminded that finding "nothing" is not a waste of time or resources, it is good news. Finding "something" can point to far bigger problems, both in frequency of occurrence and scale of the problems discovered. Finding verifiable allegations of fraud, breakdowns in internal controls,

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or management failures often requires further work to determine the true extent of the issues and to develop corrective actions.

The successful outcome of a fraud investigation should bring answers to key questions:

- Was the occurrence an employee/vendor/customer mistake or was it fraud?
- Was it due to a failure in controls or an evasion of controls?
- Has the full extent of the problem been identified?
- Will the loss be mitigated?
- How will the underlying reasons be corrected?

### Conclusion

This two-part article series discussed some basic concepts of potential risk from fraudulent activities and the common means of investigating allegations. Part I identified the major types of fraud, their frequency of occurrence, and median sizes of loss. Part II focused on fraud detection, methods used to investigate allegations of fraud, and summarized key lessons and observations gleaned from past experience. This discussion highlights key areas for insolvency professionals to consider as they investigate the causes of financial distress and identify strategies and solutions. Often those reasons involve fraud, but often they may only involve internal controls and management issues. Either way, the questions posed for consideration should be carefully considered within the context of evaluating each unique situation and client need.

# TREATMENT OF STOCK-BASED COMPENSATION IN EQUITY VALUATION



**BORIS J. STEFFEN, CDBV**

*GlassRatner*

Since the technology boom of the 1990s, the use of stock-based compensation ("SBC") has grown in popularity as a means of enhancing the total compensation packages granted to certain employees. For example, on joining PG&E Corporation April 10, 2019 subsequent to its Chapter 11 filing, the new CEO and President received an annual equity award with a target value of \$3.5 million, 25 percent of which consisted of time-based restricted stock units ("RSUs"), and 75 percent comprised of performance-based restricted stock units. This package was complemented by a one-time grant of three tranches of performance-based restricted stock options ("PRSUs"), for a total of 4.3 million options with exercise prices of \$25, \$40 and \$50 per share.<sup>1</sup>

Aside from attracting, incenting and retaining employees, the objective of issuing SBC is typically to align the interests of a firm's employees and shareholders. For cash-strapped startups and firms otherwise having to conserve cash, the use of SBC is also advantageous in that it is a non-cash expense on the date it is granted and over the period in which it vests. SBC is, however, dilutive to the value of a firm's

common equity. Consequently, it is necessary to adjust the indication of common equity value calculated in a discounted cash flow analysis for dilution from SBC outstanding and awarded prior to the valuation date, and to adjust the projected free cash flows calculated in a discounted cash flow analysis for dilution from SBC expected to be issued after the valuation date.

## Types and Attributes

Stock-based compensation includes employee stock options ("ESOs"), stock appreciation rights ("SARs") and common share equivalents.<sup>2</sup> ESOs are call options issued by a company to its employees that give the employees the right, but not the obligation, to buy a certain number of shares at a specific price, referred to as the exercise or strike price, until the ESOs' expiration date. ESOs for which the market value of the related stock is greater than the option's strike price are said to be in the money, with the difference equal to the intrinsic value of the option. ESOs differ from publicly traded stock options in that they are issued by the employee's firm rather than an independent third party, and cannot

<sup>1</sup> PG&E Corporation Form 8-K, April 10, 2019, item 5.02, <https://www.sec.gov/Archives/edgar/data/75488/000095015719000456/form8k.htm>.

<sup>2</sup> Robert W. Holthausen and Mark A. Zmijewski, *Corporate Valuation*, 2e (Westmont: Cambridge Business Publishers, LLC, 2020) pp. 558-9.

be sold, hedged or exercised by the employee until vested (i.e., employees who leave the company must forfeit unvested ESOs).<sup>3</sup>

SARs give employees the right to receive the appreciation in the value of a stock between the grant and expiration dates. Depending on their terms, SARs may be settled in cash, common stock or some other security. Both ESOs and SARs commonly vest over three- to five-year periods, though employees may have the right to exercise the option or receive the appreciation in the SARs for periods of from seven to ten years post grant date. Like ESOs, SARs are valued using the Black-Scholes option pricing model, which calculates the present value of an option at the grant date based on the price of the company's stock, strike price of the option, time to expiration of the option, expected standard deviation of returns on the stock, risk-free rate of interest and cumulative normal distribution function.<sup>4</sup>

Common share equivalents include restricted stock ("RS") and restricted stock units ("RSUs"). With these types of awards, the company does not issue stock until the grants are vested, which may occur over a period of years or on achieving specified performance targets. At that time, however, the company may choose instead to issue a different security or pay the employee the cash equivalent depending on the terms of the grant. RS and RSUs are not transferable prior to vesting, and even then, RS cannot be sold until it is registered with the Securities Exchange Commission or meets the conditions outlined in Rule 144 of the Securities Act of 1933.<sup>5</sup> RS and RSUs are usually valued by multiplying the number of shares granted by the underlying stock price at the grant date.

As for taxes, the exercise of an ESO or SAR results in taxable income to the employee based on the difference between the market price of the stock and strike price on the exercise date, or the appreciation in the value of the stock from the grant date. For a non-qualified ESO, meaning an ESO issued with a strike price greater than (out of the money) or equal to (at the money) the stock price, the employee receives ordinary income which the company deducts as an operating expense and receives a tax deduction equal in amount. For a qualified ESO (also referred to as an incentive stock option), in which the strike price is lower than the stock price (in-the-money), the company receives no tax deduction, while the employee pays capital gains (as opposed to ordinary) tax at the time the stock is sold. With RS and RSUs, the employee is taxed based on the fair market value of the RS or RSU at the time it vests, while the

company receives a tax deduction in the same amount at that time.

## Accounting Recognition

It was not common for companies to record SBC as an expense on their income statements prior to 2006. This was because under Accounting Principles Board (APB) Opinion 25, which governed accounting for SBC at the time,<sup>6</sup> stock options were measured using the intrinsic value method, whereby compensation expense was calculated as the excess of the stock price over the exercise price at the date of measurement, which often was the grant date. Consequently, as the exercise price of most stock options was at least equal to the market price when issued, no compensation expense was accounted for.

Following in June 1993, the Financial Accounting Standards Board (FASB) proposed Statement of Financial Accounting Standard (SFAS) 123, which required options to be valued based on the factors driving their value. While no adjustments were required for changes in the stock price subsequent to the grant date, compensation expense was to be recorded based on the fair value of the options expected to vest on the grant date, with fair value estimated using the Black Scholes or Binomial option pricing models. The proposal was met with a firestorm of opposition, however, by the technology sector and other industries that had made significant use of SBC, who argued that offering SBC was the only way they could attract top quality management, and that the losses they would incur as a consequence of recognizing SBC as compensation expense would diminish their stock prices and disadvantage them relative to firms more able to absorb the expense. FASB was compelled to compromise and chose in SFAS 123 to require firms that continued to follow APB 25 and not report SBC expense in their income statements to simply disclose in the notes to their financial statements what SBC expense would have been.

The turning point came with the Enron accounting fraud in 2001. Enron, then the seventh-largest firm in the U.S., disclosed more than \$1 billion in accounting malfeasance. This was followed by a series of accounting scandals, including Worldcom, Tyco, Healthsouth, Freddie Mac and American Insurance Group,<sup>7</sup> that led to increased demand for transparency in accounting, which FASB took advantage of by issuing SFAS 123 (Revised), *Share Based Payment*, in December 2004, which required firms to account for stock-based compensation expense in their income statements beginning in 2006. Known

3 Leonard C. Soffer and Robin J. Soffer, *Financial Statement Analysis: A Valuation Approach* (Upper Saddle River: Pearson Education, Inc., 2003) pp. 317-21.

4 *Id.*, p. 319-20.

5 U.S. Securities and Exchange Commission, <https://www.sec.gov/reportspubs/investorpublications/investorpubrule144.htm>

6 Nicholas G. Apostolou and D. Larry Crumbley, "Accounting for Stock Options: Update on the Continuing Conflict," *The CPA Journal* (August 2005), <http://archives.cpajournal.com/2005/805/essentials/p30.htm>

7 Corporate Finance Institute, "Top Accounting Scandals: A Recap of the Top Scandals in the Past," <https://corporatefinanceinstitute.com/resources/knowledge/other/top-accounting-scandals/>

now as Accounting Standards Codification (ASC) 718, Compensation – Stock Compensation, ASC 718 requires grants of SBC to employees to be measured at fair value at the grant date<sup>8</sup> and amortized to expense over the vesting period, adjusting for expected forfeitures or cancellations.

### Forecasting Future SBC Issuances

At the time SBC is granted, the firm's free cash flows are indirectly affected by the economic cost of the expected dilution of existing equity.<sup>9</sup> This cost is the cost to the company of repurchasing shares that it can reissue to settle SBC when exercised, net of any proceeds. Actual dilution from the increase in shares outstanding associated with SBC does not occur at the time of the grant, however. With common share equivalents, actual dilution occurs on the vesting date, and with options, at exercise. Notwithstanding, in a discounted cash flow ("DCF") analysis, the relevant measure for SBC expected to be issued after the valuation date is expected dilution.

However, forecasting dilution expected from the issuance of SBC requires forecasts of the company's stock price in each year of the discrete forecast as well as for the terminal period, which is difficult if at all feasible to do since the expected stock price in each year will incorporate dilution from all SBC expected to be issued in the future. In the alternative, SBC may be forecasted based on measures of scale or performance of the company. Using the *expense ratio method*, SBC in a year may be forecasted as a percentage of revenue or expense based on historical expense ratios. For example, Amazon's SBC is embedded in cost of sales, fulfillment, marketing, technology and content, and general and administrative expenses in its 2018 income statement.<sup>10</sup> And of Amazon's \$28.8 billion technology and content costs, which equaled approximately 12% of net sales,<sup>11</sup> \$2.9 billion, or 10%, was from SBC.

With the *grant-date value method*, SBC in a year may be forecasted based on the company's grant-date value ratios. In this approach, SBC embedded in the expenses reported in the company's income statement is removed. In turn, the value of SBC granted in the year is determined from the footnote disclosures to the company's financial statements and adjusted for expected forfeitures. This value is then scaled by revenue or the expense deemed most appropriate for purposes of forecasting the value of SBC in the year.

The *exercise-date value method* is used to forecast SBC in a year based on the actual value of SBC that vested or

was exercised in the year. As with the grant-date value method, SBC embedded in the expenses reported in the company's income statement is removed. The actual value of the SBC that vested or was exercised is then scaled by revenue or the expense considered most appropriate for purposes of forecasting the value of SBC in the year.

It should be noted that the value of SBC for a company that is growing and issuing more SBC each year might be higher for the grant-date method than the expense ratio method. Further, each method assumes that the information available is adequate and that forecast drivers can be reasonably identified. In addition, the expense ratio and grant-date methods assume that the SBC was valued correctly at the grant date, while the expense ratio method assumes also that the amortization of SBC granted previously, whether based on an accelerated or straight-line method, was reasonable.

### Adjusting for SBC Outstanding

In a DCF analysis, the value of common equity is generally calculated by subtracting the value of debt, preferred stock and other non-common equity claims from the value of the firm.<sup>12</sup> The price per share is then calculated by dividing the value of the common equity by the number of shares outstanding. However, a DCF analysis customarily calculates the value of a company's total equity, including common stock, ESOs, warrants and convertible securities. The value of total equity value must therefore be allocated to common equity and any outstanding equity-linked securities by (1) adjusting the number of shares outstanding for equity-linked securities that are similar to common shares, and (2) by subtracting the value of equity-linked securities such as ESOs and warrants from total equity value.

Three methods used to adjust the number of shares outstanding for previously issued and outstanding equity-linked securities are the Fully Diluted, Treasury Stock and Option Valuation methods.<sup>13</sup> The Fully Diluted method assumes that all options are exercised as of the valuation date, with the common shares issued added to shares outstanding. However, this method counts all outstanding restricted stock and options regardless of whether vested or in-the-money and ignores the cash proceeds from exercise and value of the options.

The Treasury Stock method assumes the exercise of all in-the-money options and warrants at the beginning of the period or when issued, and that common shares will be issued. The proceeds from the exercise are also assumed to be used to purchase common stock

8 Financial Accounting Standards Board, ASC 718-10-30; ASC-10-25; ASC 718-10-35.

9 Holthausen and Zmijewski, p. 563.

10 Amazon.Com, Inc. Form 10-K, for the Fiscal Year Ended December 31, 2018, p. 61.

11 *Id.*, p. 37.

12 Holthausen and Zmijewski, p. 568-9.

13 American Society of Appraisers Business Valuation Committee Special Topics Paper #5 Consideration of Stock-Based Compensation in the Valuation Process. *Business Valuation Review*: Summer 2018, Vol. 37, No. 2, pp. 51-55.

at the average market price during the period. The difference between the number of shares assumed to be issued and purchased is included in the denominator of the diluted EPS computation.<sup>14</sup> Like the Fully Diluted method, however, the Treasury Stock method does not capture the time premium associated with the value of the options, or consider vesting.

The Option Value method utilizes an option-pricing model such as the Black-Scholes or Merton models. Using this method, the company's outstanding options are valued directly and subtracted from the value of the company's equity. The resulting equity value is then divided by the company's primary shares outstanding to calculate value per share. Like the Fully Diluted and Treasury Stock methods, the Option Value method does not address vesting, however.

### Conclusion

SBC is a non-cash expense when granted and over the period it is expensed. Nevertheless, it is necessary to adjust the value of common equity calculated in a DCF analysis for dilution from SBC granted and outstanding prior to the valuation date, and to adjust the projected free cash flows in a DCF analysis for dilution from SBC expected to be issued afterwards. Understanding these distinctions is essential to calculating a relevant and reliable indication of a company's equity value.

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<sup>14</sup> Financial Accounting Standards Board, ASC 260-10-45-23.

#### ABOUT THE AUTHOR



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# TRENDS IN BANKRUPTCY COMPENSATION<sup>1</sup>



**BRIAN CUMBERLAND and J. D. IVY**

*Alvarez & Marsal*

Executives may find little motivation to remain employed at a company as annual bonus plans become compromised and long-term incentive vehicles (e.g. stock options, restricted stock) become virtually worthless. As a result, it is imperative that an organization implement an alternative compensation arrangement to retain key executive talent and incentivize them toward the level of performance necessary to achieve a successful restructuring. We summarize some of the different types of plans below.<sup>1</sup>

## Key Employee Retention Plans (KERPs)

In effort to incentivize “non-insider” employees<sup>2</sup> to remain with the company during a bankruptcy period, “stay” bonuses are implemented through a Key Employee Retention Plan (“KERP”). These bonuses are often expressed as a percentage of the employee’s base salary and distributed throughout the corporate transition period, generally, with the final (typically

largest) payment linked to the process resolution (e.g. emergence, liquidation). Compensation under a KERP is typically in the form of cash.

For “insiders,” since BAPCPA prohibits the use of retention programs companies must generally adopt alternative bankruptcy protection plans.

## Key Employee Incentive Plans (KEIPs)

The increased restrictions brought forth by the BAPCPA pushed many companies to transition away from KERPs for “insiders” in favor of performance-based incentive plans, known as Key Executive Incentive Plans (“KEIPs”). This approach is not subject to the limitations imposed by Section 503(c)(1) as explained below, and rather, applies more liberal judgment standards to determine if the plan is viable for a debtor company. This determination can generally be made through ordinary business sense, and an evaluation of the facts and circumstances of a given case.

The performance metrics under these plans coincide with the company’s goals and objectives and provide incentive payments to key employees who achieve these goals. Generally, these goals tend to be tied to financial metrics, restructuring goals, or a combination

<sup>1</sup> This article was previously published in ABI Journal, Vol. XXXVIII, No. 1, January 2019. Reprinted with permission.

<sup>2</sup> 11 U.S.C. section 101(31)(B), defines an insider to be a director, officer, or person in control of the corporation, or a relative of such person. Additionally, parties can be deemed non-statutory insiders if their relationship with the debtor is so close that their conduct should be subject to closer scrutiny than that of those dealing with the debtor at arm’s length.

of both. The performance goals must not be a “lay-up,” but instead must be a challenge to achieve.

In 2012, Chapter 11 debtors Hawker Beechcraft, Inc. (“Hawker”) and Residential Capital, LLC (“ResCap”) each filed motions seeking approval of KEIPs both of which were denied. In each case, the court found that the KEIPs were essentially disguised retention programs. The court in Dana Corporation’s bankruptcy case (“Dana II”) approved its modified executive compensation plan after finding that the debtors’ second attempt at formulating a compensation plan was a true incentivizing plan for senior management and was wholly different than its initial proposed compensation plan.

In *In re Hawker Beechcraft, Inc.*, 479 B.R. 308 (Bankr. S.D.N.Y. 2012), the proposed KEIP offered to pay bonuses of up to 200% of annual base salary (\$5.3 million) to 8 senior management employees upon the occurrence of a standalone restructuring or a third-party sale transaction. The judge concluded that while “the KEIP includes elements of incentive compensation, when viewed as a whole, it sets the minimum bonus bar too low to qualify as anything other than a retention program for insiders.” It was determined that the minimum financial targets set in the KEIP were based on the current business plan and did not constitute stretch goals. This finding was supported by testimony that Hawker would certainly achieve its business plan projections unless there is a “whoopsie.” Additionally, the court concluded that the time-based goals were not challenging, as the debtors were on track to achieve several of the deadlines and the deadlines could be extended with proper consent.

In *In re Residential Capital, LLC*, 478 B.R. 154 (Bankr. S.D.N.Y. 2012), the proposed KEIP would pay up to \$7 million in bonuses to 17 members of the senior leadership team. The court denied the debtor’s motion to approve the KEIP, finding that the program rewarded work that took place prior to the bankruptcy, and was structured to reward employees for simply remaining in employment instead of incentivizing them to meet performance goals. The judge noted that 63% of the KEIP bonuses were linked solely to closing the sale transactions that had been substantially negotiated pre-petition.

In *In re Dana Corp.*, 358 B.R. 567 (Bankr. S.D.N.Y. 2006), after the debtor had its initial compensation program rejected by the court because it was essentially a retention plan disguised as an incentive plan and could not pass muster under Section 503(c)(3), the program was modified as a true incentive plan. The court approved the revised plan, noting that the compensation plan was similar to incentive programs offered by the debtor prior to filing for bankruptcy, and therefore they were within Dana’s ordinary course of business. In order to

evaluate whether the revised plan could survive the strict scrutiny necessitated by Section 503(c), the court applied the following factors:

1. Whether there is a reasonable relationship between the plan proposed and the results to be obtained, i.e., will the key employee stay for as long as it takes for the debtor to reorganize or market its assets, or, in the case of a performance incentive, is the plan calculated to achieve the desired performance.
2. Whether the cost of the plan is reasonable within the context of the debtor’s assets, liabilities, and earning potential.
3. Whether the scope of the plan is fair and reasonable; does it apply to all employees; does it discriminate unfairly.
4. Whether the plan is consistent with industry standards.
5. Whether the debtor engaged in due diligence related to the need for the plan, the employees that needed to be incentivized, and what types of plans are generally applicable in a particular industry.
6. Whether the debtor received independent counsel in performing due diligence and in creating and authorizing the incentive compensation.

Not surprisingly, bankruptcy courts generally disapprove motions to approve KEIPs where the majority of the work required to earn payments is performed prior to the bankruptcy filing date and the business goals are not difficult to achieve. As a result, companies considering the use of KEIPs should utilize performance metrics that are challenging to attain and that are not disguised KERPs.

### Pre-Filing Retention Plans

A recent trend has been the use of a pre-filing retention plan for “insiders” and “non-insiders.” The pre-filing retention plan is generally subject to a clawback provision where the employees must repay the amounts if they do not provide certain specified services for the required time period. Although the clawback provision could incorporate certain performance metrics, retention bonuses are typically time-based. The time period for which services must be performed to retain the bonus is typically at least 6 months but is oftentimes multiple years depending on the company’s circumstances.

One potential concern is that payments under a pre-filing retention plan are a fraudulent transfer or a preference. The argument for these plans is that the estate is receiving value—the retention of key employees during a time of financial distress.

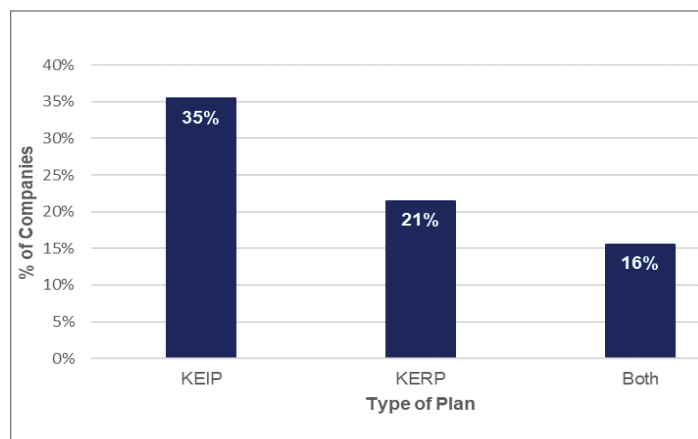
More companies are utilizing such plans due to their many advantages over using plans developed under the watchful eye of bankruptcy courts, and some of those advantages include:

1. Eliminating the need for negotiations with courts and creditors;
2. Focusing on employees who may be contemplating leaving the company; and
3. Having the flexibility to either broadly or narrowly focus plans depending on the organization's needs.

As with all retention plans, companies will need to consider the length of the retention period, the effect on employee pay expectations once the retention period ends and the overall retention award amount. Balancing those concepts effectively can help organizations better deal with employee attrition.

### Bankruptcy Compensation Plans Database Observations

The chart below shows the prevalence of approved compensation plans for the bankruptcies reviewed for this article:



### Utilization by Industry

We also observed the breakout of compensation plans by industry:

- **KEIPs:** Among the companies we reviewed, the prevalence of KEIPs was highest in the retail industry at 62.5%. The retail industry was followed by manufacturing industry and mining industry at 45% and 38%, respectively.
- **KERPs:** Among the companies we reviewed, the prevalence of KERPs was the highest in the retail industry at 44%, followed by the mining industry at 36% and manufacturing industry at 24%.

- **Both:** The leading industry with both KEIPs and KERPs was the retail industry at 31%, followed by mining industry at 26% and the manufacturing industry at 18%.

As indicated in the chart above, KEIPs were the most common compensation plans implemented during bankruptcy. Among companies that emerged from bankruptcy, the most common performance metrics included in KEIPs were:

- Financial metrics (EBITDA, cash flow, operating income, liquidity);
- Asset sales;
- Confirmation of plan of reorganization/emergence from bankruptcy (usually by a specified date);
- Creditor recovery; and
- Product sales.

Among companies that liquidated, the most common performance metrics included in KEIPs were:

- Asset sales;
- Cost reduction/expense control; and
- Financial metrics.

### Common Objections

The U.S. Trustee, a component of the Department of Justice responsible for overseeing the administration of bankruptcy cases, has increased its scrutiny of bankruptcy plans and has objected to various components of the compensation plans. The most common U.S. Trustee objections we observed were:

- Questioning whether the company "insiders" had been appropriately identified (making sure an "insider" was not a participant in a KERP);
- For KEIPs, was the plan performance based as opposed to a hidden retention plan (not a "lay-up"); and
- Was the plan's potential payout scaled appropriately (i.e., was the plan too rich).

### Post-Bankruptcy Incentive and Retention

The battle to retain and motivate key employees does not end simply upon exit from bankruptcy. When emerging from bankruptcy, most pre-bankruptcy company stock, along with unvested equity awards, have lost their value. Lack of meaningful equity ownership in the go-forward entity, coupled with an uncertain company future, can lead to post-bankruptcy retention and motivation difficulties. Post-bankruptcy equity grants ensure that companies retain motivated personnel vital to a successful post-bankruptcy entity.

Some important considerations for post-bankruptcy grants include:

- What percentage of the new company's equity should be reserved for employee equity awards?
- What portion of the equity pool should be granted post-bankruptcy?
- Who should be eligible for post-bankruptcy grants (officers, middle management, all employees)?
- How will the post-bankruptcy grants be structured (i.e., size and type of award, vesting, etc.)?

Most companies emerging from bankruptcy will reserve a portion of the new company's shares to provide equity to employees. The typical share reserve depends on the size of the company. Depending on the company's needs post-bankruptcy, awards can be structured as a retention vehicle (full-value equity vehicle with vesting based on time), an incentive vehicle (vesting based on performance) or a combination of the two.

### Conclusion

BAPCPA has created a structure by which bankruptcy courts can evaluate compensation plans, however the courts still retain the authority to exercise discretion, especially for incentive plans designed to escape treatment under Section 503(c)(1). Therefore, in designing incentive and retention plans, companies should make every effort to create plans that are "fair and reasonable." Not only is it best practice but doing so demonstrates the company's commitment to management and its accountability to shareholders.

Companies should also be aware of the possible ways to motivate and retain its employees in a distressed

environment. Companies should review the plans they have in place and evaluate the impact of those plans should the company enter bankruptcy protection. Lastly, they should carefully examine any compensation plans implemented at or near the time the company files for bankruptcy to ensure it meets the requirements under BAPCPA.

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## EVA, NOT EBITDA:

## A NEW FINANCIAL PARADIGM FOR PRIVATE EQUITY FIRMS

**BENNETT STEWART***Institutional Shareholder Services (ISS)***Introduction: EBITDA versus EVA**

Is EBITDA – cash operating profit – the best way to measure value and monitor a business? Should company managers be asked to increase EBITDA and be paid bonuses for doing that?

Private equity (PE) firms, as a rule, think the answer is “Yes,” and not without cause. Many of them have been very successful using EBITDA (earnings before interest, tax, depreciation, and amortization) as a formula to measure and grow value. EBITDA also is a critical measure of the cash flow available to service debt, and the ability to service debt is usually a PE priority.

Nevertheless, EBITDA is less correlated to market value than is commonly thought, and it is riddled with omissions and distortions that make it a highly unreliable guide to how well a company is performing. We argue that there is a much better metric for valuation and management purposes – so much better that PE firms should consider adopting it to replace EBITDA, or at the very least, to complement it.

In this memo, we explore the shortcomings of EBITDA by comparing it with EVA (Economic Value Added), which measures a firm’s true economic profit after deducting a full, weighted-average cost-of-capital interest charge on the net assets used in the business.

EVA is effectively the exact opposite of EBITDA. It is measured after taxes, after setting aside depreciation and amortization as a proxy for the cash needed to replenish wasting assets, and after ensuring all investors, lenders and shareholders alike, are rewarded with a competitive return on their capital. EVA is the true bottom-line profit score that directly discounts to value.

Our empirical review suggests that stock values are determined by the EVA profits that companies generate, and that EBITDA multiples are plug figures – a byproduct of valuation, but not a cause of it.

In our analysis of the Russell 3000, we find that EBITDA explains only 9 percent of variations in Enterprise Value, while EVA explains 22 percent.

In a second test, we examined the values of companies within distinct sectors. Here again, EVA has a higher explanatory power. The median r-squared in explaining Enterprise Value within 43 industry groups is 38 percent for EBITDA and 57 percent for EVA.

Private equity firms that begin to use EVA will be able to value companies more accurately and with greater insight into the factors determining the value. They also will be able to use EVA as a better tool to monitor their portfolio companies and keep tabs on their performance and plans. Some PE firms may decide to bring EVA in-

house for some of their portfolio companies and use it to enhance decisions. As the PE business continues to mature and become more competitive, smart firms will look for every advantage they can muster. For some, EVA could make a difference between success and mediocrity.

### A Simple Example of Why EBITDA is a Poor Measure of Value

Let's begin with a simple example that shows why EBITDA may provide a misleading measure of value.

Imagine two companies, call them A and B, that have the same EBITDA and projected EBITDA growth rate. If the two companies also have the same risk profile, then one would be forced to conclude that their value is the same and that they would trade for the same multiple of EBITDA because they are indistinguishable.

But now suppose that company B needs to invest less capital into its business each year to produce the same EBITDA as company A. Can we now say for certain that one of them is more valuable?

Yes, we can. Company B is unquestionably worth more than A. Its investors are entitled to the same EBITDA year by year while keeping more money in their pockets. Company B's "free cash flow" – cash flow from operations net of investment spending – is higher, which endows it with more cash to distribute to investors. Put another way, company B gives investors a higher rate of return on their money. The ratio of EBITDA output per unit of capital input translates into a higher yield. And more to the point, company B earns more EVA. There's more economic profit remaining after deducting a lower cost-of-capital capital charge on a lower capital base.

Company B is more valuable than company A and will trade for a higher multiple of EBITDA every year. Why would an investor pay the same value for company A when company B is worth company A plus more cash? Follow the logic, and companies cannot trade for multiples of EBITDA or EBITDA growth rates, or else, simple arbitrage opportunities would be plentiful. Everything else equal, a company that generates more cash flow, a higher return on capital, and more EVA is worth more than another company with identical EBITDA. The conclusion? EBITDA in isolation is poor way to measure value.

### EBITDA's Failures as a Management Tool

Because of its valuation shortcomings, EBITDA can lead to bad decision making. Some of its shortcomings include:

1. **EBITDA does not encourage discipline around soliciting or investing capital.** Managers need never worry about generating a decent return on capital or even a return of the original capital

investment because capital, in the EBITDA world, is a free resource.

2. **EBITDA ignores the value of managing assets and accelerating asset turnover**, which results in releasing superfluous capital.
3. **EBITDA systematically understates the value of outsourcing.** Consider a company that sells its technology assets and converts to third-party cloud operations. Profit-and-loss (P&L) costs increase to pay for the outsourced services, which reduces EBITDA. But EBITDA ignores the benefit of selling the associated assets and releasing capital.
4. **EBITDA overstates the value of vertical integration.** Why ever farm out production or distribution, and give up some margin? The correct answer is that shedding capital may be worth more than losing the margin. But again, EBITDA is blind to that.
5. **EBITDA favors higher margin products and services, regardless of the additional capital those lines may need** compared to lower margin lines.
6. **EBITDA sees no benefit in lowering a company's tax bill** or deferring taxes or using up loss carryforwards.
7. **With EBITDA, there's never a value to selling or exiting a business if it is cash profit positive.** And yet, selling or exiting poor performing and time-sapping units and lavishing attention on the remaining ones can add a lot value.
8. **EBITDA is distorted by bookkeeping rules that do not always reflect economic reality** (for instance, expensing R&D outlays, or deducting reported pension costs).
9. **EBITDA is not mathematically connected to value.**

PE firms are generally aware of these handicaps and find ways to mitigate them – they are, after all, financially sophisticated. They put a heavy hand on spending capital – it's hard to come by – and they cover EBITDA's blind spots by tracking other metrics, such as working capital turnover, capital expenditure, or return on capital. But PE firms can do that only by overruling what EBITDA is saying, and only by adding complexity and ambiguity to the management equation. There is a better way. Instead of rationing capital, charge for it. Instead of following many metrics, start with an overarching score, namely EVA, and use other metrics to explain that.

## EVA is a Superior Management Tool

Start with this: EVA is directly linked to value via the basic finance concept of net present value. To be specific, the present value of a forecast for EVA is always identical to the net present value, or NPV, of the forecast cash flows. This is not an assertion. It is mathematically true. By deducting the capital charge, EVA automatically sets aside the profit that must be earned in each period to recover the value of the capital that has been invested or will be invested, which means that EVA always discounts to the premium over, or discount under, the capital invested in the business. To increase EVA is to increase a company's NPV, share price, and total shareholder return – by definition. Nothing of the sort can be said for EBITDA.

A goal to increase EVA thus provides managers with the correct incentives to create value – in any business – by going down any of these paths:

1. **Operating Efficiently:** The first imperative EVA trumpets is to cut costs and raise prices; that is, to find ways to raise profits without raising capital. Granted, there's no specific advantage to EVA here – many other performance measures also suggest these moves are wise. But EVA is not missing them either.
2. **Managing Assets Effectively:** EVA is the only profit performance measure that fully and correctly increases when balance sheet assets decrease. EVA calls on managers to streamline supply chains and accelerate asset turnover as a tactic to reduce capital. It tells them to prune marginal plants, products, and markets, and to exit businesses that aren't covering the cost of capital – even if this means forfeiting sales, EBITDA, or profit margin. EVA also disciplines managers to invest new capital carefully, conservatively, and imaginatively, because they face a lingering charge for using it.
3. **Growing Profitably:** EVA also rewards managers that put more capital to work to innovate, scale and fuel growth, so long as the return on the capital exceeds the cost of raising the capital. And unlike return on investment (ROI), EVA increases when managers pursue all profitable growth opportunities with returns above the cost of capital, even if those returns are projected to be lower than the ROI the firm is currently earning. EVA gets the incentives right, at the margin, on new investments and new decisions, and without the distortions of legacy decisions or legacy capital.
4. **Optimizing Tradeoffs:** Managers can also add value by making consistently better choices. EVA helps, because it distills all the pluses and

minuses cutting across the income statement and balance sheet into a net score of added value. It guides managers to decisions that might never occur to them if EBITDA – or EBITDA and a grab bag of other metrics – dominated their thinking.

EVA increases, for example, when outsourcing decisions reduce the total sum of operating costs and capital costs. EVA also rises when the proceeds from selling a line of business, invested at the cost of capital, produce more profit than continuing to run it. A manager can also choose strategies by their potential for EVA. For example, is a slower-growth, higher-return strategy more valuable than a lower-return, higher-growth path? The answer is whichever one will generate the most EVA.

Many companies find decisions like these challenging, and often reach the wrong conclusions. But EVA deftly navigates the cross currents and resolutely points to the right answers.

EVA widens its lead over EBITDA by systematically applying a set of corrective adjustments that repair defects in accounting<sup>1</sup>. Accounting rules mandate, for example, that companies expense research and development (R&D) outlays. The ultra-conservative treatment can deter managers from boosting R&D budgets even when profitable opportunities are in front of them, for fear of the upfront hit to book profits.

Expensing R&D also ironically relieves managers of accountability for it. In most companies, R&D just gets factored into budgets at an established level, and managers can spend up to that level with impunity. Because accountants treat R&D as an expense, it is managed as an expense.

With EVA, the treatment of such investments is totally different. A company's R&D is written off over a pre-set industry-specific period, and the cost of capital is applied as a charge to the outstanding accumulated R&D spending balance (which is added to capital). That way, managers are far more willing to increase their research budgets as they see promising and perhaps fleeting opportunities emerge – because they know they have the time needed to make the investment pay off. But in exchange, managers know they are on the hook for recovering the investment and earning a decent return on it over time, because they are charged for it even into future periods. Managers start to manage R&D and allocate resources to it as a strategic variable rather than setting it at a traditional budget level. Depending on

<sup>1</sup> For a discussion of the rules and the decisions they induce, consult The EVA Measurement Formula, by Bennett Stewart, available at <https://www.issgovernance.com/solutions/iss-analytics/iss-eva-resource-center/>

the company, this approach can be a significant source of added value, while it also makes EVA an even better measure of performance.

The same rule applies to advertising and promotion expenditures – for instance, to launch a business or build a brand. With EVA, these investments are also written off over time with interest charged on the balance. Managers who are paid to increase EVA suddenly start to spend marketing resources against the life cycle value of customers rather than against a preconceived budget. They eagerly and aggressively build valuable franchises rather than getting trapped into short term thinking.

Consider one last example. With EVA, restructuring charges are added back to earnings and added back to capital. With that rule, a restructuring adds to EVA if the benefits, in terms of streamlining costs and redirecting capital, exceed the cost of any new capital invested in the restructuring. A restructuring is no longer an admission of failure to be avoided. It can be a proactive opportunity to invest in a positive NPV project, one that managers will eagerly pursue.

The adage “what gets measured gets managed” is true. By crafting a set of rules to remedy accounting illusions and measure EVA with greater accuracy, a PE firm can mold the behavior of its management teams in positive ways that create value and that discourage them from pursuing sub-optimal decisions. Teaching a management team about EVA and the rules used to compute it, and how they can move the EVA needle, does take some time and effort.<sup>2</sup> But it is a highly EVA-positive investment. It is a proven tactic to improve financial literacy and establish a common language across an organization, which speeds decisions, enhances communication, promotes teamwork, and supports delegating decisions to those closer to the action.

To conclude, EVA is a far more comprehensive, more cohesive, and much more value-based metric and management technique, compared to EBITDA.<sup>3</sup> PE firms would be wise to use it to measure value, and to guide and motivate managers in their portfolio companies.

<sup>2</sup> A successful adoption of EVA also requires software tools to compute, analyze, value and report on EVA, per the specific rules chosen to measure EVA. ISS licenses software solutions for just this purpose, which are easy to implement, configure and use.

<sup>3</sup> For a more complete description of the EVA management model, consult *Best Practice EVA*, a book by Bennett Stewart (at Amazon, <https://www.amazon.com/Best-Practice-EVA-Definitive-Maximizing-Shareholder/dp/1118639383>)

## EBITDA versus EVA Test Results

EVA clearly trumps EBITDA as a management technique. But does it beat EBITDA as a measure of stock market values?

To test this, we analyzed the Russell 3000 companies as of March 12, 2019, excluding financials, real estate, utilities, smaller biotech firms, and companies with less than \$100 million in sales, leaving 1,773 observations.<sup>4</sup>

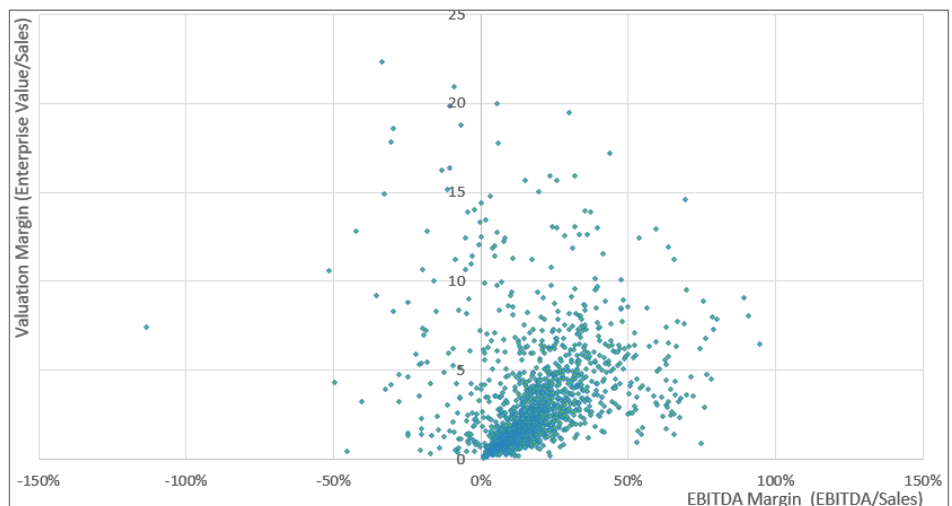
The correlation between EBITDA and EVA among those firms is 30 percent. Put another way, a regression of EVA to EBITDA has an r-squared of just 9 percent. The two measures are only slightly correlated. For all the reasons outlined in the paper, there is a great difference between EVA and EBITDA. Our effort next was directed at determining if one of them is a better measure of value.

We began by looking at the correlation between EBITDA and Enterprise Value in the chart below (Exhibit 1), which plots EBITDA versus Enterprise Value (both variables have been divided by sales, which makes it possible to compare companies of different sizes).<sup>5</sup> It's a cloudy picture. The dispersion is so great that a regression of Enterprise Value to EBITDA produced an r-squared of only 9 percent. Companies plainly do not trade at any consistent multiple of EBITDA. Of course, analysts don't look at valuations relative to the whole market, but relative to an industry. We'll cover that a little later.

<sup>4</sup> There were 2975 companies in the Russell “3000” as of the test date. We eliminated 210 financial firms, along with 75 utilities, 211 REITs and real estate development companies, 219 biotech companies with sales under \$1 billion, 138 companies with sales under \$100 million, and 37 companies with bad or missing data.

<sup>5</sup> Technically, the correlations and regressions were performed between the ratios of Enterprise Value/Sales and EBITDA/sales. Dividing by sales was necessary to size adjust the variables and eliminate the spurious correlation that arises because larger companies tend to generate more EBITDA and trade for larger values. We also observed that Enterprise Value/Sales ratios tend to be smaller for larger, more mature firms. The regression model therefore also included a “Size” variable (the natural log of the average of sales and capital), which entered with a statistically significant negative coefficient.

**Exhibit 1: Enterprise Value vs EBITDA**



To examine the correlation between EVA and Enterprise Value we need an intermediate step, because, in theory, EVA does not discount to value. It discounts to the value added, that is, to the spread between a company's Enterprise Value and the Capital it has invested to produce the value. We refer to the spread as MVA, or Market Value Added:

$$\text{MVA} = \text{Enterprise Value} - \text{Capital}$$

A firm with a \$1 billion Enterprise Value, for example, which has invested \$600 million in capital on its balance sheet, has an MVA of \$400 million, the difference.

MVA is triply significant.

1. MVA measures the owners' accumulated wealth; it is the spread between the total money put into a business and the total value coming out of it.
2. MVA represents franchise value – it's the valuation premium above invested resources that is due to the firm's distinctive organization strengths and intangible assets.
3. MVA measures the firm's aggregate NPV. MVA is a summing up in the market's mind of the net present value of all capital projects, those a firm already has in place plus those projected to materialize down the road.

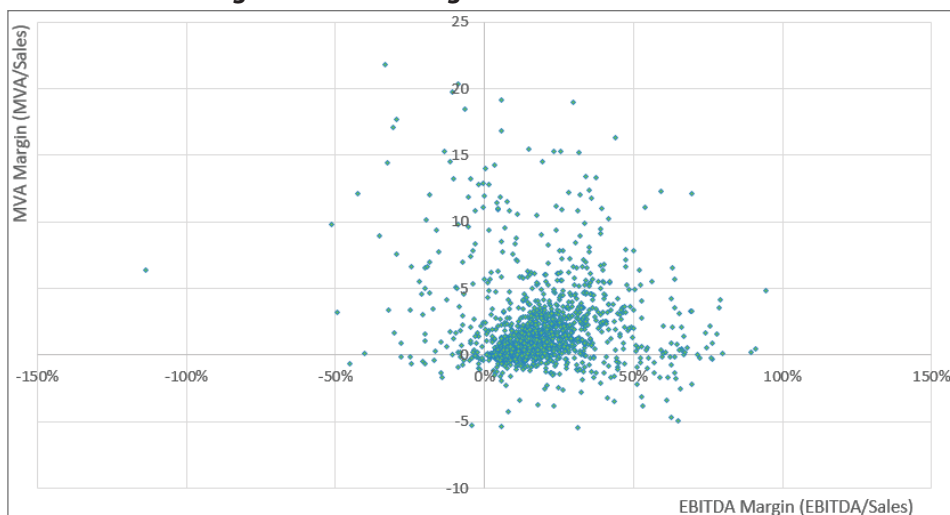
Increasing MVA is thus the real key to creating wealth, adding to franchise value, and increasing the firm's NPV, all at the same time. Increasing MVA is also the key to driving shareholder returns.<sup>6</sup>

The truly important question, then, is not whether EBITDA explains Enterprise Value, but whether EBITDA explains MVA. The short answer is no, not at all.

A regression of size-adjusted MVA to EBITDA produces white noise, the scattered diagram below (Exhibit 2),

<sup>6</sup> The mathematical link between EVA, MVA, and shareholder returns asserted here has been derived and tested, and is available in a separate ISS whitepaper, *The Link Between TSR and EVA*, available at <https://www.issgovernance.com/solutions/iss-analytics/iss-eva-resource-center/>

**Exhibit 2: MVA Margin vs EBITDA Margin**



with an r-squared of just 4.8 percent. EBITDA is almost perfectly uncorrelated with MVA, just as finance theory predicts, because EBITDA ignores the capital side of the wealth equation.

We expect EVA to be much better at predicting MVA because, as mentioned, a company's net present value, or MVA, is mathematically equal to the present value of the EVA profit it is projected to earn. In the regression to test this, we used a firm's lagging EVA as a proxy for its projected EVA. In effect, we assumed that each firm's EVA will persist at its current level forever. It's a gross simplification that ignores the potential for growth in EVA, but it shows how well EVA performs compared to EBITDA with the same constraint.

The regression of MVA to EVA,<sup>7</sup> based on the chart (See Exhibit 3), shows an r-squared of 21.4 percent. That's not terrific – this is a simple model, applied regardless of industry and ignoring growth potential. But the analysis demonstrates that EVA is fundamentally more correlated – 5 times more correlated – with enhancing NPV and creating wealth than EBITDA.

The correlation between EVA and MVA, however, is much stronger and more interesting when firms are clustered into groups. In this analysis, we ranked companies low to high by their EVA/sales ratios, then we assigned companies in that order to 35 bins of 50 companies each, thus covering 1,750 firms (or all but the 23 companies with the very highest EVA-to-sales ratios). We then computed the median EVA/sales and MVA/sales ratios for each of the 35 bins and plotted the pairs (see Exhibit 4), with the following conclusions:

First, note that once EVA turns positive, EVA multiplies into MVA along a straight line.

Second, when EVA is zero or near zero, MVA tends to be close to zero, too. Just as finance theory predicts, investors are unwilling to pay much if any premium value for firms that deliver only a basic, break-even, rate of return on their capital. They will only pay for the book capital in the business. This shows that the cost of capital we have computed is a real cost, with a real market impact. Until a firm earns it, it does not create wealth and it cannot produce exceptional shareholder returns. Observe also that the companies falling short of their cost of capital and that are producing negative EVA tend to trade for an MVA near zero, no matter how negative EVA gets to be.

<sup>7</sup> As with the EBITDA, the variables are common-sized, by dividing by sales, and the regression model includes a term for company size, as MVA/Sales ratios tend to be smaller for larger, more mature firms.

This last finding, surprising at first hearing, is a sign of market sophistication. Investors have learned from experience that managers in negative EVA businesses feel pressure and respond. They restructure operations, redirect resources and rethink strategies, or they liquidate assets or sell the company. They manage to raise EVA to zero or near zero or realize something close to the net book value of their assets in a sale.

There's something else going on, too. The negative EVA group also contains emerging start-up companies that are not yet covering their cost of capital but are forecast to reach that mark someday.

For whichever reason, the market sets a floor on the value of negative EVA companies considered as a portfolio.<sup>8</sup> This is another critical valuation insight that EVA gets but EBITDA does not.

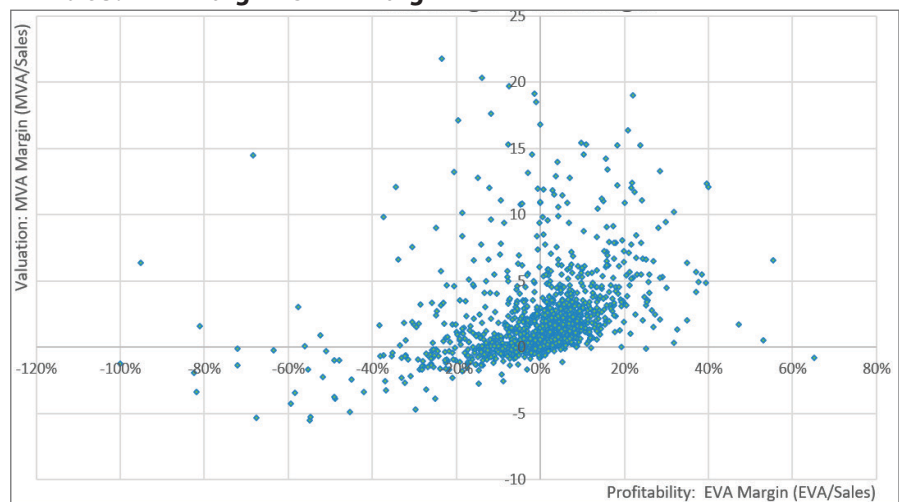
Given this relationship, we reran the regression of MVA to EVA by setting the value for EVA to 0 whenever a firm's EVA was negative. In effect, we assumed that the expected long-run EVA of all negative EVA companies is zero. It's a bold assumption, but does it work?

The regression r-squared did drop a tad, from 22.4 percent to 21.9 percent (because there is, in fact, a slight valuation penalty as EVA becomes more negative), but in exchange, the coefficient on EVA increased from 17.6 to 18.5 and the t-statistic rose from 18.2 to 19.5 (99.9999% confidence). The new model is better. It more closely fits the actual line connecting EVA and MVA. It sets a more positive and significant slope to EVA when EVA is positive and sets the slope on EVA to zero when EVA is negative.<sup>9</sup> We use this version of the model in the industry regression runs discussed below.

<sup>8</sup> This is not a new phenomenon or peculiarity of the current market; The relation between EVA and MVA documented in this study was also documented in 1991 with the publication of *The Quest for Value*, by Bennett Stewart. The assumption that negative EVA companies as a group will rebound, restructure, or sell and generate a long-run breakeven for EVA is apparently a permanent feature of the valuation landscape.

<sup>9</sup> We also tested a second EVA variable that was set to zero when EVA was positive, in other words, it was populated only when EVA was negative. Adding it increased the r-squared a tad, but, the coefficient and t-stat on it were much smaller and much less significant than on the EVA positive variable, we chose to ignore it.

**Exhibit 3: MVA Margin vs EVA Margin**

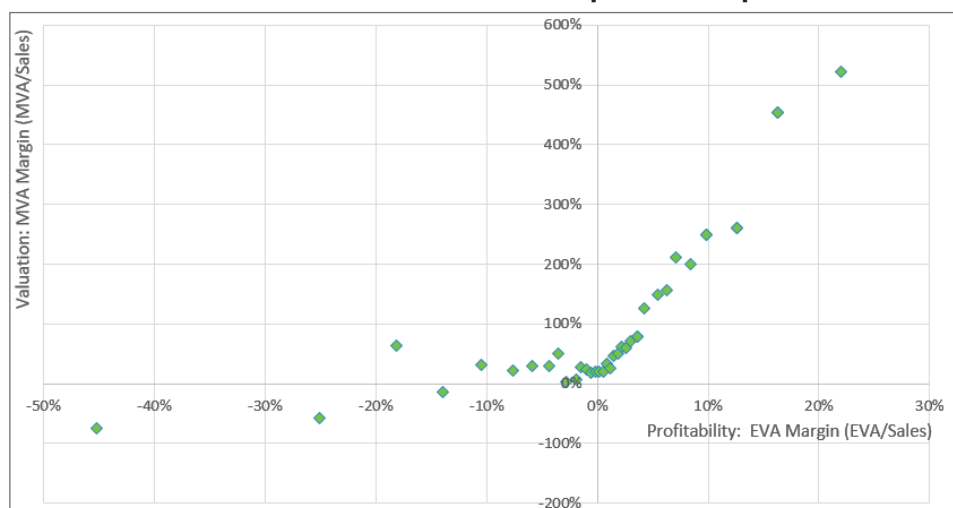


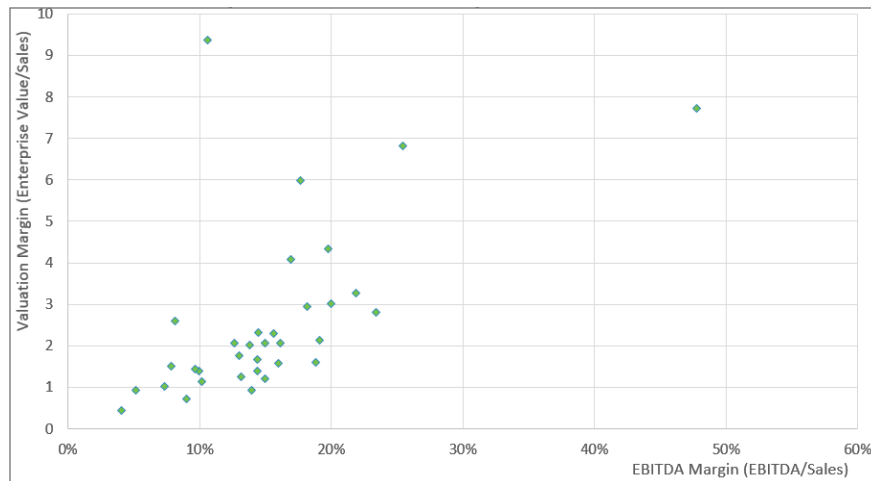
### Valuations within Industry Groups

The regressions we've reviewed so far assume investors assign the same multiples to all Russell 3000 firms regardless of industry. It's more realistic to assume that valuation multiples cluster within industry groups – something PE firms have long recognized. We therefore assigned all 1,773 companies into 44 groups using standard industry classification (SIC) codes and performed the same regressions within each group.

As an example, we consider the plot of size-adjusted EBITDA versus Enterprise Value for the 34 companies in the Aerospace and Defense industry (See Exhibit 5 on next page). There is an evident upward slope connecting the dots. The r-squared is 42 percent; the coefficient on EBITDA is 17.6, with a t-stat of 4.8 (significant at the 99.9% confidence level). Enterprise Values tend to increase as a multiple of EBITDA in this industry, as in many others. The statistics confirm it: clustering companies by industries makes sense.

**Exhibit 4: Media MVA/Sales vs EVA/Sales for Groups of 50 Companies**



**Exhibit 5: Aerospace and Defense: Enterprise Value vs EBITDA**

Good as that is, EVA is much better. A regression of size-adjusted MVA to EVA for the Aerospace and Defense companies has an r-squared of 62 percent<sup>10</sup> with a coefficient on EVA of 32.8 and t-stat of 6.6 (Exhibit 6).

EVA, note, packs almost twice the punch of EBITDA. A 1-percent increase in a firm's EVA/sales ratio tends to increase its MVA wealth premium by 32.8 percent of sales; a 1-percent increase in its EBITDA-to-sales margin increases Enterprise Value by only 17.6 percent of sales; it's half as helpful. But not only that. EBITDA increases a firm's Enterprise Value while saying nothing about how much capital was required to do it. EVA, however, increases MVA. It tells us how much the firm's Enterprise Value increased above and beyond the capital that the firm invested, which is a much more significant result.

We ran the same regressions for all industries; a summary table appears in Exhibit 7 on p.42: Industry Regression Results. In brief, we found:

- The median r-squared with Enterprise Value across all industries is 32 percent for EBITDA and 47 percent for EVA. The EVA advantage is even wider – a median r-squared of 58 percent versus 38 percent for EBITDA – when limited to the 29 industries that contain 20 or more companies and where EBITDA or EVA are significant valuation variables. EVA is thus approximately 15 to 20 percent better.
- EVA was more significant than EBITDA in 22 industries, and EBITDA in 8, but of those, three contained very few observations – Biotech (more than \$1 billion in sales), 12 companies, Internet Services, 11, and Wireless Communication, 9.
- EVA is significantly better in most capital-intensive industries, such as Auto and Suppliers, Oil and Gas, Media, Communication Equipment,

Construction, Household Durables, Paper and Packaging, and Semiconductors. That's expected, because EVA explicitly recognizes the cost of capital.

- EVA also outperforms EBITDA in Commercial Services and Supplies, Food and Beverage Retailing, Specialty Retail, and Professional Services, which might be surprising; after all, these are businesses that aren't especially asset intensive. The cost of capital, though, can still be a considerable charge and an important valuation factor relative to the meager margins that these companies typically work with.<sup>11</sup>

The finding that EVA dominates EBITDA as a measure of stock market value will no doubt surprise many. After all, sell-side research reports and the business media are rife with references to EBITDA and notably scarce on EVA. But our findings don't imply or require that investors literally compute or analyze EVA in determining value. Some investors do – ISS provides EVA-based research to an expanding clientele of institutional investors, for example – but many do not explicitly consider EVA. No matter.

As has been noted, the present value of EVA and the net present value of cash flows are mathematically identical. So long as most investors measure intrinsic value by analyzing and discounting cash flows (or indirectly, by looking at indicators that help them gauge the magnitude, quality, timing and risk of cash flows), then EVA and MVA, and by extension, EVA and Enterprise Value, will be strongly correlated.

This is a very important point. One does not have to believe in "EVA" to think it is sensible to use EVA – one needs only to subscribe to the view that valuations follow discounted cash flows, and the significance of EVA as a valuation metric and the correlation to creating wealth that we have documented in this paper follow as a natural by-product.

### Using EVA to Determine Enterprise Value

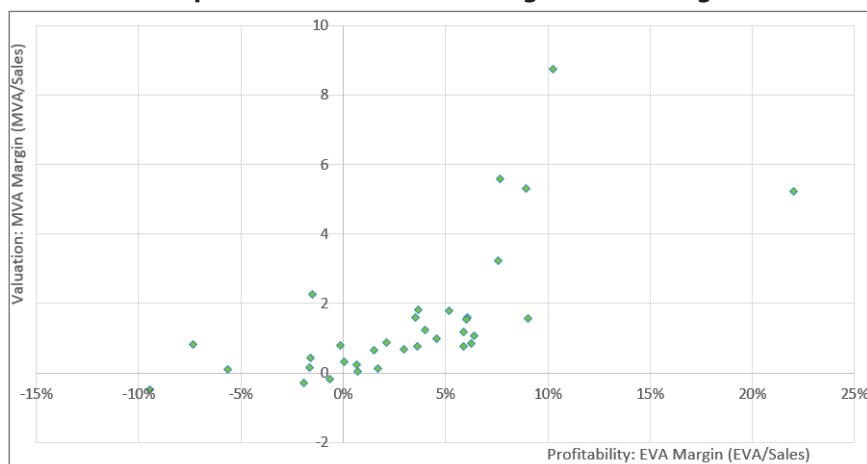
Given that EVA is an effective valuation metric, how, specifically, can PE firms use it to measure value? After all, EVA does not discount to share price or market value per se; EVA discounts to net present value, that is, to MVA, which is a company's Enterprise Value minus the Capital invested in its business:

$$\text{MVA} = \text{Enterprise Value} - \text{Capital}$$

<sup>11</sup> Neither EVA nor EBITDA performed well in 9 industries, including Tech Hardware, Software, Pharma, Life Sciences, Internet Media, and Health Care Equipment and Supplies. In dynamic businesses like these, the outlook varies so considerably from company to company the current levels of EBITDA and EVA don't convey much information. We did not attempt to model future growth expectations. Had we, there is every reason to expect that EVA would significantly outperform EBITDA since EVA discounts to NPV while EBITDA does not.

<sup>10</sup> Technically, the r-squared of size-adjusted EVA with MVA was 58%, but it is 62% versus Enterprise Value because a portion of the variation in Enterprise Value is due to variation in Capital. Consult the Technical Appendix for more details.

**Exhibit 6: Aerospace and Defense: MVA Margin vs EVA Margin**



By rearrangement, Enterprise Value is:

$$\text{Enterprise Value} = \text{Capital} + \text{MVA}$$

And MVA, the company-wide NPV, is equal to the present value of EVA:

$$\begin{aligned} \text{Enterprise Value} = \\ \text{Capital} + \text{The Present Value of EVA} \end{aligned}$$

The formula says that the enterprise value of a business considered as a going-concern is the amount of capital money put into it plus the present value of the EVA profit projected to come out of it. EVA is the reason, and the only reason, a company is worth more, or less, than the money put into it.

The capital part is easy. It's the firm's net assets as of the valuation date.<sup>12</sup> The present value of EVA is harder. An analyst begins, per usual, by preparing a P&L and balance sheet projection, taking account of the developments they foresee for revenues, operating margins, taxes, working capital turnover, capital expenditures, and the like. The next step is to compute the EVA profits implied by the financial forecast, and then to discount the projected EVA to a present value at the firm's cost of capital. Putting the two together – the firm's capital and the discounted EVA value – yields the estimate of the firm's intrinsic Enterprise Value.

Once again, the EVA procedure produces the same valuation as discounting the cash flows. For a given projection, EVA does not give a new answer, it is the same answer – which is essential, of course. Still, there are very good reasons to prefer using EVA for valuations instead of cash flow.

For one thing, a projection of EVA reveals how much value is being added or lost in *each projection period*. If a forecast shows EVA will be zero or close to it, for example, there is no value added over the plan horizon. No matter what any other measures suggest, an analyst will instantly understand why that business is worth just

the book value of the capital put into it. And if an analyst models out several forecast scenarios, the one that produces the more rapid expansion in EVA is immediately recognizable as the one that is worth more, and again, *irrespective of what any other measure may say*.

An analyst also can directly trace the forecast for EVA to underlying assumptions. An improvement in working capital turnover, for instance, appears as a line-item reduction in the capital charge and thus as a directly measurable improvement in EVA. Whether the assumption covers P&L costs, or revenues, or capital utilization, the impact on EVA is clear, and thus, the impact on value is clear, too.

EVA not only gives a valuation answer; it gives insights into why the answer is the answer – the valuation is not just a black box – and it reveals and quantifies the key factors that are determining the value. Perhaps the best way to describe EVA, then, is that it is the simplest and most effective way to estimate and understand a company's intrinsic cash flow value.

### EVA is a Superior Management System

EVA not only can estimate value, but it can also play an active role in helping PE firms to create value. How? By empowering the management teams in portfolio companies to make better decisions.

The idea, in a nutshell, is to get the teams to focus on increasing EVA as their paramount financial goal and to use it broadly. Managers should use EVA to measure value and make decisions by projecting it and discounting it to measure NPV, second, as a check, for reviewing performance and benchmarking with peers, and third, potentially as a yardstick for metering bonus pay. Using EVA in this comprehensive manner is what makes it simple, accountable, and adaptable.

It's simple because one metric threads through and unites all applications. There's no need for cash flow calculations for valuations and capital budgeting purposes and other sets of metrics for other applications. That's a common solution, but complex in practice. Instead, measures like cash flow, ROI and EBITDA can be retired. They are redundant and inferior to just keeping all eyes focused on the goal of increasing EVA.<sup>13</sup>

The EVA model also introduces much stronger accountability for results. If managers want more capital, and get it, they must deliver more EVA, period. They

<sup>12</sup> Net assets must be adjusted to reflect the corrective adjustments EVA applies. The net assets exclude excess cash, for example, and include the remaining balance of R&D spending carried over from prior years.

<sup>13</sup> EVA is nowadays a much more effective analytical tool since it's been converted into a series of performance ratios and a companion ratio analysis framework. It's described in detail in the book, *Best-Practice EVA*, available on Amazon, and at a high level, in the ISS whitepaper, *The Four Key EVA Performance Ratios*, available at <https://www.issgovernance.com/solutions/iss-analytics/iss-eva-resource-center/>

## Exhibit 7: Industry Regression Results

### EBITDA regression:

Enterprise Value/Sales = a + b x EBITDA/Sales + c x SIZE + e

### EVA regression:

Enterprise Value/Sales = Capital/Sales + a + b x EVA/Sales + c x SIZE + e

Industry Group		# Companies	Adj R <sup>2</sup>	Variable	t-stat	Size	t-stat
1 Aerospace&Defense	EBITDA	34	42%	17.7	(4.8)	-0.43	(-2.5)
	EVA		61%	32.8	(-2.7)	-0.37	(6.6)
2 Airlines	EBITDA	12	57%	6.7	(2.6)	-0.04	(-0.5)
	EVA		60%	10.4	(0.9)	0.06	(2.9)
3 Auto & Suppliers	EBITDA	29	32%	9.2	(3.3)	-0.16	(-1.4)
	EVA		46%	17.5	(-1.1)	-0.11	(3.9)
4 Biotech	EBITDA	12	25%	-10.1	(-2.0)	0.49	(0.6)
	EVA		8%	-9.4	(-0.6)	-0.49	(-1.1)
5 Chemicals	EBITDA	60	31%	8.1	(5.3)	-0.13	(-1.2)
	EVA		25%	12.2	(0.3)	0.03	(4.1)
6 Commercial Services and Supplies	EBITDA	55	22%	6.7	(4.1)	-0.06	(-0.3)
	EVA		73%	26.7	(0.9)	0.10	(8.9)
7 Communication Equipment	EBITDA	33	38%	8.4	(4.6)	-0.07	(-0.3)
	EVA		60%	18.1	(0.4)	0.06	(8.7)
8 Conglomerates and Machinery	EBITDA	103	68%	16.5	(14.8)	-0.18	(-2.9)
	EVA		68%	25.1	(-2.2)	-0.13	(12.1)
9 Construction	EBITDA	62	68%	16.1	(11.1)	-0.09	(-1.0)
	EVA		76%	26.9	(-0.3)	-0.03	(10.6)
10 Diversified Consumer Services	EBITDA	19	-3%	2.8	(0.4)	-0.83	(-1.2)
	EVA		14%	14.4	(-1.3)	-0.81	(1.6)
11 Diversified Telecom Services	EBITDA	15	57%	11.7	(4.6)	-0.49	(-2.4)
	EVA		79%	30.5	(-3.3)	-0.44	(3.0)
12 Electrical Equipment	EBITDA	26	-9%	0.1	(0.1)	-0.03	(-0.1)
	EVA		33%	3.2	(-0.3)	-0.06	(1.0)
13 Electronics and Office Equipment	EBITDA	56	45%	11.9	(6.1)	-0.48	(-3.1)
	EVA		48%	23.8	(-1.9)	-0.29	(5.4)
14 Energy Equipment and Supplies	EBITDA	58	6%	2.8	(2.3)	0.07	(0.6)
	EVA		-36%	21.4	(-0.7)	-0.11	(3.5)
15 Entertainment	EBITDA	23	0%	4.5	(1.3)	-0.01	(0.0)
	EVA		29%	28.9	(-1.1)	-0.24	(3.6)
16 Food and Beverage (ex Tobacco)	EBITDA	52	65%	18.9	(9.8)	-0.42	(-4.0)
	EVA		73%	26.3	(-3.8)	-0.34	(10.3)
17 Food and Staples Retailing	EBITDA	21	41%	12.0	(4.0)	-0.02	(-0.6)
	EVA		66%	29.4	(-1.4)	-0.03	(5.2)
18 Freight Transportation	EBITDA	45	88%	10.8	(17.3)	0.14	(2.1)
	EVA		61%	20.8	(1.2)	0.16	(5.2)
19 Health Care Equipment and Supplies	EBITDA	70	4%	-2.4	(-0.6)	-0.57	(-1.5)
	EVA		4%	20.6	(-3.0)	-0.96	(2.6)
20 Health Care Providers	EBITDA	63	17%	5.0	(1.3)	-0.73	(-3.6)
	EVA		49%	37.5	(-3.4)	-0.56	(5.7)
21 Hospitality	EBITDA	39	9%	4.4	(2.2)	-0.26	(-1.6)
	EVA		22%	23.6	(-1.4)	-0.21	(6.1)
22 Household and Personal Care	EBITDA	23	42%	20.0	(4.2)	-0.24	(-1.4)
	EVA		64%	31.0	(-2.5)	-0.30	(7.4)
23 Household Durables	EBITDA	46	2%	7.9	(1.3)	-0.47	(-1.6)
	EVA		32%	19.5	(-1.6)	-0.38	(2.2)
24 Internet Media	EBITDA	16	-13%	0.2	(0.0)	0.22	(0.3)
	EVA		-33%	-1.5	(0.5)	0.27	(-0.2)
25 Internet Retail	EBITDA	22	29%	13.8	(3.3)	-0.33	(-1.1)
	EVA		20%	15.6	(-0.5)	-0.18	(2.3)
26 Internet Services	EBITDA	11	74%	-32.0	(-5.5)	2.82	(2.8)
	EVA		-47%	-64.4	(-0.4)	-0.74	(-0.4)
27 IT Services	EBITDA	61	44%	15.0	(6.3)	0.15	(0.6)
	EVA		54%	23.0	(0.9)	0.19	(6.3)
28 Leisure	EBITDA	16	-10%	2.3	(0.8)	0.01	(0.1)
	EVA		1%	15.0	(-0.3)	-0.04	(3.6)
29 Life Sciences	EBITDA	21	6%	6.8	(1.7)	-0.38	(-0.7)
	EVA		-1%	6.5	(0.2)	0.10	(1.1)
30 Media	EBITDA	45	35%	9.5	(5.1)	-0.27	(-1.4)
	EVA		62%	29.4	(-1.5)	-0.21	(9.8)
31 Metals and Mining	EBITDA	33	59%	11.1	(6.9)	-0.27	(-1.6)
	EVA		47%	9.6	(-1.2)	-0.23	(1.8)
32 Oil & Gas Exploration and Production	EBITDA	99	29%	5.1	(6.2)	-0.14	(-1.0)
	EVA		52%	34.9	(0.3)	0.04	(3.6)
33 Paper and Packaging	EBITDA	29	45%	9.3	(5.0)	-0.08	(-0.8)
	EVA		57%	9.5	(-0.6)	-0.05	(3.2)
34 Pharmaceuticals	EBITDA	30	-6%	0.9	(0.6)	0.04	(0.2)
	EVA		-22%	7.4	(-0.9)	-0.17	(3.0)
35 Professional Services	EBITDA	38	32%	14.9	(4.3)	-0.10	(-0.3)
	EVA		43%	26.4	(0.3)	0.11	(3.4)
36 Restaurants	EBITDA	36	66%	22.2	(8.4)	-0.77	(-3.1)
	EVA		57%	27.9	(-2.6)	-0.70	(6.6)
37 Semiconductors	EBITDA	64	16%	9.7	(3.6)	-0.52	(-1.9)
	EVA		26%	18.4	(-1.7)	-0.36	(5.1)
38 Software	EBITDA	107	0%	-0.7	(-0.3)	-0.35	(-0.9)
	EVA		-4%	17.5	(-3.0)	-1.07	(2.6)
39 Specialty Retail	EBITDA	92	17%	5.5	(4.6)	-0.08	(-1.1)
	EVA		60%	23.6	(-1.6)	-0.08	(10.4)
40 Technology Hardware	EBITDA	18	8%	4.1	(1.2)	-0.33	(-1.9)
	EVA		-3%	17.1	(-1.6)	-0.26	(3.0)
41 Textile, Apparel and Luxury Goods	EBITDA	24	46%	16.3	(4.0)	0.07	(0.5)
	EVA		59%	31.2	(-0.2)	-0.03	(6.1)
42 Trading Companies	EBITDA	40	93%	9.1	(22.8)	-0.20	(-2.1)
	EVA		96%	17.1	(-3.4)	-0.23	(6.3)
43 Wireless Communications	EBITDA	9	58%	11.4	(3.4)	-0.55	(-2.3)
	EVA		-122%	398.6	(-1.1)	-0.70	(0.8)

### Legend

	EVA better
	EBITDA better
	Neither better
	Neither good
	<20 observations

must cover the cost of the capital they request and invest. When they find that they are so visibly responsible for making good on their promises, managers respond by scrutinizing decisions with much greater intensity and thinking about alternatives with much more creativity.

EVA also increases a company's agility. If the goal to increase EVA is paramount, then every other measure can flex (except mission-critical goals, potentially including safety, health, environmental, and strategic objectives). Managers no longer are straightjacketed into meeting targets for micro-metrics. They can use common sense and adapt plans and adjust decisions as circumstances dictate. For example, they won't keep investing capital to meet growth or margin targets when the return on the incremental investment is no longer attractive. Instead, they will change course and drive the most value by creating the most EVA. In short, they will aim to win games, not mindlessly follow game plans.

EVA thus differs from EBITDA in another, very important way. It is a technique that PE firms can adopt to accelerate the creation of value within their portfolio companies.

### A Special EVA Solution for PE Firms

For all of EVA's advantages, there are two caveats: PE firms must service the debts taken on to acquire companies, and they typically are judged on the internal rate of return (IRR) of their investments. It may seem, therefore, that ROI or EBITDA or cash flow metrics are needed and would be superior to EVA given those constraints, but that is not so.

The optimal solution is still to use EVA for managing and valuing businesses, but with a simple modification. EVA should be measured using an artificially high cost of capital, a rate well above actual market expectations, as high as 12 percent or more, for example. Posting an after-tax charge on capital as great as 1 percent a month or more tells managers to work extra hard to sweat capital out of the balance sheet. A high hurdle rate also pushes back on projects that otherwise would be accepted, leaving only the very highest returning investments to pass muster, and a lot of cash flow to repay debt in the wake.

Doing this is not without a sacrifice. Imposing an artificially high cost of capital chokes investments that would be favorably valued in the stock market. Still, if cash constraints are real, and if PE firms are judged by IRR, then that cost is unavoidable, and they must pay it with or without EVA. EVA, however, is the best way to recognize the cost and enable managers to work around it.

If applying such a high cost of capital rate turns what seems a profitable business into an EVA loser, that is of no consequence. The goal with EVA is always to increase it. Making a negative EVA less negative is just as valid

a way to improve performance and create value as it would be to take an EVA that is positive and make it more positive. It's the change that counts, not the level.

A goal of increasing EVA can be applied to any business, regardless of its starting point, regardless of legacy assets or liabilities, regardless of how much or little capital intensity is required by the business model, which is another reason why EVA should hold great appeal to PE firms. They can use EVA to establish a common scorecard that will apply across their entire portfolio of businesses, no matter how diverse they are. No other measure, or set of measures, can do that.

### Closing Comment

For many, it is an article of faith that companies are worth a certain multiple of EBITDA. The evidence presented here strongly refutes that notion. Stocks trade on cash flow, net of investment, or better, on the prospects for EVA, on generating economic profit above the cost of capital, as all economic logic suggests they should. Enterprise or EBITDA multiples do not determine value but are derived from it.

Despite the findings of this paper, it is unlikely PE firms will abandon EBITDA. There's too much institutional inertia behind EBITDA. But at the least, PE firms should apply EVA to complement EBITDA in due diligence investigations and company valuations, and for reviewing the performance, plans, and decisions of portfolio companies while they hold them.

The biggest payoff, however, is arranging portfolio companies to "adopt" EVA. By this we mean the management team is trained about EVA and how to use it. They are equipped with tools that enable them to evaluate the performance of the company and its lines of business, and simulate the value of plans and decisions, through the lens of EVA. An EVA-capable team is apt to make better decisions, surface more valuable plans and investments, react faster and more intelligently to changing circumstances, and accelerate the creation of value that is at the very heart of the PE mandate.

### ABOUT THE AUTHOR



#### BENNETT STEWART

*Institutional Shareholder Services*

Bennett Stewart is Senior Advisor with ISS, the global leader in corporate governance, and an expert in shareholder value, corporate performance management, and incentive compensation. He pioneered EVA, or economic value added, a valuation and management framework that Fortune dubbed "the real key to creating wealth," and which was adopted

by hundreds of companies globally following publication of his book, *The Quest for Value*, in 1992. He formed EVA Dimensions to enhance EVA with software and data bases, which he sold to ISS in 2018. Bennett also is the inventor of PRVIt, an EVA-based stock rating model that ISS licenses to investors. The latest generation of EVA is chronicled in his book, *Best Practice EVA* (2012).

### Achieving Financial, Operational and Academic Efficiency

U.S. colleges and universities cannot rely as heavily on state and federal funding as they have in the past. Aside from raising tuition – an option which may be maxed out given significant increases to date and the resulting decline in student enrollment – other material funding options include fundraising, asset monetization and taking on additional debt.

Some institutions may be able to realize significant economic benefit through philanthropic contributions. For example, in 2017, eight of the 19 charitable gifts of \$100 million or more went to public colleges. However, transformative gifts of that caliber take a strong brand identity, deep alumni network and community of support. At the same time, the recently passed Tax Cuts and Jobs Act of 2017 could have a negative impact on charitable giving from middle-class donors. The act nearly doubles the standard deduction, giving taxpayers less incentive to itemize – and therefore make – charitable contributions. The Tax Policy Center (TPC) projects that 62 percent fewer households with income levels between \$75,000 and \$200,000 will benefit from charitable deduction under the new law. Institutions should certainly continue building philanthropic support, but they must also diversify funding through other means.

Over the last decade, more colleges and universities have tried raising capital through debt. However, many find that poor ratings from the agencies deter would-be creditors. The number of higher education institutions rated by S&P increased by nearly 50 percent between 2006 and 2016. During that same timeframe, the number of institutions with a BB or B rating – indicating significant speculation, uncertainties or exposure to adverse conditions – increased by more than 600 percent.

In addition to impacting individual institutions, poor ratings can cast a dark cloud over the whole sector. Moody's reports that aggregate operating revenue at four-year institutions is expected to increase by 3.5 percent in 2018. However, growth in operating expenses is expected to outpace that at approximately 4 percent. Because of this, Moody's recently downgraded its rating of the U.S. Higher Education sector from "stable" to "negative" (Exhibit 7) and reaffirmed a "negative" rating for 2019.

In its annual sector outlook, published in January 2019, S&P also reiterated its prior negative forecast, commenting that "students' continued expectations of increased college affordability and lower tuition and debt at the same time they demand enhanced facilities, services and general college experience have left many institutions at a difficult operational crossroads. Institutions continue to struggle to communicate their value proposition to potential students and parents, while balancing an increasing financial aid burden as competition for students drives tuition discount rates higher."

Moody's did note in its overall downgrade of the sector that solid reserves add a stabilizing element to the sector. Therefore, if student demand proves steady, if cash and investment levels remain strong and if institutions can sustain revenue growth of at least 3 percent while keeping it above expense growth, the outlook could shift back to "stable." S&P also implied that if institutions become more flexible and adapt to change, brighter future outlooks are possible; however, risks outweigh opportunities and, thus, a negative outlook persists.

To keep revenue growth above expense growth and to ensure prudent financial management to deal with future unknowns, many institutions need to rethink their business models. This involves making internal

**Exhibit 7: Moody's Credit Rating of the US Higher Education Sector (2015 – 2019)**

	2015	2017	2019
RATINGS	Stable	Negative	Negative
FACTOR	Expected increase in state funding and improved revenue growth at 4-year public and private institutions	In 2018, operating expenses are expected to exceed revenue due to decline in state funding and slowdown in tuition growth	Weak net tuition revenue growth outpaced by increasing expenses, 65%-75% of which are labor costs

Source: Institute of International Education - 2018 OpenDoors Survey

## Exhibit 8: Illustrative Questions for Assessing an Institution's Sustainability

Academic	<ul style="list-style-type: none"> <li>• Are enrollment and faculty levels in alignment?</li> <li>• Are classes set up efficiently to ensure maximum enrollment in each course?</li> <li>• Are faculty teaching loads optimal?</li> <li>• Is the faculty appropriately balanced among tenured, contract and adjunct instructors?</li> <li>• Are programs not sustaining the core mission appropriately evaluated for cost-effectiveness?</li> <li>• Is course scheduling efficient both from space and academic perspectives?</li> <li>• Are all issues of collaboration, consolidation and integration "on the table"?</li> <li>• Are the faculty and administration "speaking with one voice"?</li> <li>• Does the institution address cost and value from students' employment opportunity perspective?</li> </ul>
Operational	<ul style="list-style-type: none"> <li>• Have shared services and outsourcing been analyzed to ensure economies of scale and the provision of quality services? What services can be discontinued or outsourced?</li> <li>• Are the costs of infrastructure and back-office functions in line with the institution's mission, size and revenue?</li> <li>• Is there a plan to update aging facilities?</li> <li>• Are fixed costs at the appropriate level?</li> <li>• Is the management support structure appropriately sized and appropriately managed?</li> <li>• Are academic administrations operating cost effectively?</li> </ul>
Financial	<ul style="list-style-type: none"> <li>• Does the institution have sufficient liquidity and a substantive financial forecasting capability?</li> <li>• Does the institution have a substantive budgeting approach and are all reporting entities taking responsibility for their budgets?</li> <li>• Have all asset monetization opportunities been analyzed?</li> <li>• Is the institution using its real estate in the most optimal, efficient and cost-effective manner?</li> <li>• Is the endowment at an appropriate level?</li> <li>• Is the school's support community providing necessary and appropriate elements of support?</li> <li>• Is the institution focused on long-term strategic planning, analyzing potential risks and opportunities, in concert with sustainability?</li> </ul>
The "Change Readiness" Test	
<ul style="list-style-type: none"> <li>• Are the institution and its leadership teams realistically positioned to make difficult decisions to create change and embrace economic models that are financially sustainable?</li> <li>• Does the institution and its board have a clear vision for the future, and is it equipped to effectively communicate its vision with all constituents, both within the institution and throughout its support community?</li> </ul>	

measurements, benchmarking against industry peers and asking tough questions like those outlined in Exhibit 8. These models must be economically sound, based on financial sustainability and practically effective to advance the school's mission and meet the changing needs of its students.

By taking a hard look at these areas and ensuring that operational and academic structures are right-sized based on the institution's volume, revenue and mission, colleges and universities will not only achieve greater efficiency, they will also be able to better demonstrate value to students and stakeholders.

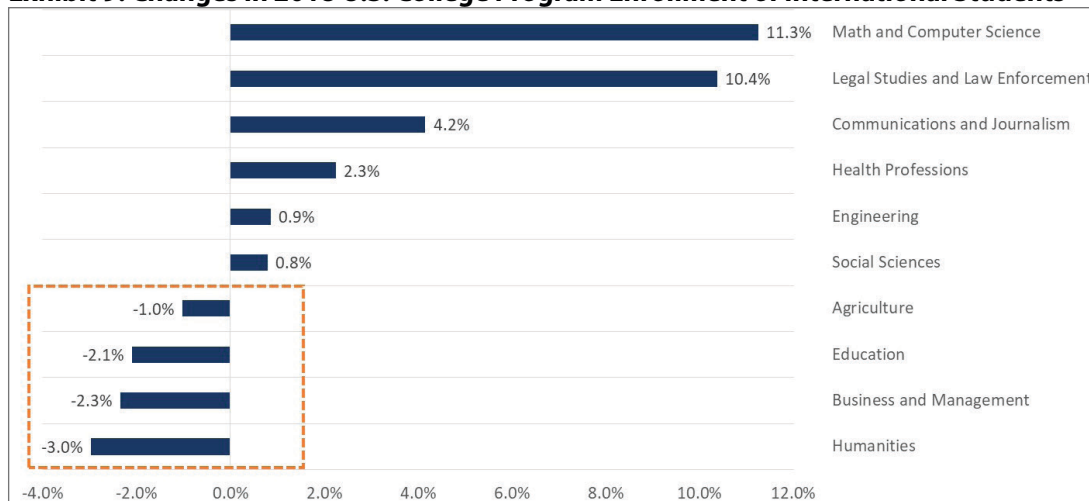
### Demonstrating Value

Prospective college students today all felt the Great Recession's impact in one way or another. Many first-time freshmen – members of Generation Z – remember their parents, friends or neighbors struggling with job loss, home foreclosure or insurmountable debt. Students with workforce experience who are returning to school for an advanced degree or in pursuit of a new career may have experienced those struggles firsthand. The point is that incoming college students are more cost and debt conscious than ever before, and their primary purposes for obtaining a higher degree

are to achieve employment and to maximize their income. To compete for these students and their carefully-guarded tuition dollars, institutions must demonstrate clear value and return on investment.

One obvious requirement is to align academic programs to current job market demand. Students in the U.S. are increasingly choosing degree programs that yield greater post-graduation job prospects. Between 2010 and 2014, enrollment in science and technology programs increased by 49 percent. In math and statistics, they increased by 35 percent; in information technology by 32 percent and in engineering by 26 percent as demand for STEM (science, technology, engineering and mathematics) professionals has risen dramatically across industries. During that same period, enrollment declined in humanities programs like history, philosophy, religious studies and literature (Exhibit 9). In fact, the percentage of all bachelor's degrees awarded in humanities dipped below 12 percent in 2015.

In addition to carefully considering employment and income prospects associated with their chosen degree, today's students are also especially mindful of the supplemental costs of higher education –

**Exhibit 9: Changes in 2018 U.S. College Program Enrollment of International Students**

Source: Institute of International Education - 2018 OpenDoors Survey

housing, meals, travel and supplies. Many students are looking for alternative learning methods that offer greater accessibility at a lower cost. In 2017, there were more than 9,400 MOOCs available composing over 500 credentialing programs and a growing number of degree programs. While MOOCs can't match the interactive or hands-on learning potential of a traditional classroom or laboratory, alternative or blended teaching models that combine the accessibility of online instruction with experiential learning (e.g., online instruction, flipped classrooms,<sup>2</sup> blended MOOCs,<sup>3</sup> etc.) may make higher learning more time- and cost-efficient, thereby demonstrating even greater value to students and their families.

### Owning the Core Mission

In this new landscape, even the strongest colleges and universities must acknowledge the need for change, plan for a less favorable revenue environment and implement necessary financial strategies. Failure to do so, or postponing until tomorrow what must be done today, will ultimately put a sustainable mission at risk.

To maintain an institution's viability, it is the responsibility of an institution's board, management team and faculty to

- Ensure reliable levels of cash and liquidity based on sound budgeting and financial forecasting with clear strategies in alignment with the core mission
- Strengthen the institution's financial statements from both balance sheet and income statement perspectives with the overall objective of long-

term sustainability, again in concert with the core mission

- Focus on and strengthen the core characteristics of the institution to differentiate the school from its competition
- Demonstrate detailed academic programming to fulfill the school's mission with enhanced scrutiny on academic quality and integrity, buttressed by cost-effective faculties, class programming and academic support centers (remain open to divesting from assets, activities and programs that are non-core)
- Right-size operational support and shared services teams with a focus on quality and efficiency
- Optimize the use of all fixed assets and explore appropriate opportunities for asset monetization
- Align academia with a sustainable business model
- Find common ground among the administration and faculty to make the necessary transformation while protecting the mission and core business

Each institution's board of trustees must hold management, executives and faculty accountable for maintaining efficient financial and operating models to provide true academic value to students.

### Conclusion

Between 1980 and 2012, the total number of higher education institutions in the U.S. increased by more than 46 percent from 3,231 to 4,726. By 2014, that number dropped to 4,627. The emerging landscape, carved by declining government support, diminishing enrollment and longstanding inefficiencies, is more competitive than ever.

<sup>2</sup> In a flipped classroom model, students typically receive the lecture component of a course through a recorded video they watch independently in their own time, and they attend class in person to participate in coursework, group work or discussions.

<sup>3</sup> Blended MOOCs are a variation of flipped classrooms in which students supplement their online learning through less frequent in-person meetings with a small group, instructor or teaching assistant.

Since 2016, more than 100 for-profit, 22 major liberal arts nonprofit colleges and 36 public colleges have closed, consolidated or announced they will consolidate, according to Education Dive, which tallies closures. Even before they downgraded their overall outlook for the higher education sector to “negative,” Moody’s and S&P predicted that mergers and closures – particularly of smaller institutions – could double or triple in the coming years. The sector understands there are too many higher education institutions in the U.S. The economic reality is that many schools will not survive given the numerous challenges facing higher education.

The colleges and universities that rise above the bleak forecasts for the higher education sector will be those that are willing to adapt and embrace sustainable financial, operational and academic models. To accomplish this, each school at risk must have administrative and academic leadership on the same page, developing well-defined, thoughtful strategies across the entire institution and working cohesively to implement a revitalized vision and path for long-term sustainability.

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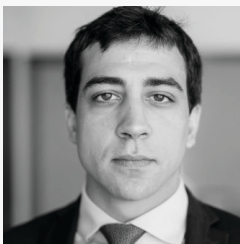


### 1<sup>st</sup> PLACE

#### Shannon Soong, CIRA

##### Focus In, LLC

Shannon Soong is the Managing Member of Focus In, LLC, a business consulting firm based in Georgia. He is a graduate of UCLA and holds a CPA as well as Certified Insolvency and Restructuring Advisor (CIRA). Shannon has close to 20 years of Accounting and Finance experience with businesses ranging from startup to Big 4 and Fortune 100 public companies in a variety of industries including Media and Entertainment, and Real Estate. In addition to advising and consulting clients with distressed asset portfolios or emerging from bankruptcy, Shannon has previously served in Assurance and Advisory at Deloitte, as well as Controllershship Senior Manager at The Walt Disney Company, and Vice President of Finance at Shine America. Shannon currently lives outside of Atlanta with his wife and three boys where they enjoy time with friends and family playing and watching sports (still a Lakers, Dodgers and Kings fan!) and enjoying the Gulf Coast.



### 2<sup>nd</sup> PLACE

#### Julien Castello, CIRA

##### JPMorgan

Julien joined JPMorgan in the U.S. in 2015 and moved to the workout team in London in January of 2016, where he covered distressed clients in EMEA and APAC across all industries and products. He then moved back to the US in November 2017 to join the workout team at JPMorgan, covering distressed clients of the bank in North American and Latin America. He found interest in the CIRA training when he moved to the US, seeing it as a good way to learn how to adapt his non-U.S. restructuring skills to the U.S. landscape. Julien reports it has been a great experience and helped with his day-to-day job. Prior to joining JPMorgan Julien held various positions in Europe and South America. In his spare time, he enjoys exercising, painting, reading and travelling.



### 3<sup>rd</sup> PLACE

#### Roger Bischof

##### Equasia

Roger is dually qualified as a lawyer and CPA, and is a member of the American Academy of Attorney-Certified Public Accountants (AAA-CPA). Prior to joining the Asia-based restructuring boutique Equasia as a partner, he was an associate at Baker McKenzie in Singapore and Switzerland as well as a senior consultant corporate finance and senior auditor at Deloitte. Roger focuses his practice primarily on cross-border restructurings and insolvencies as well as Chinese inbound and outbound investments. With his interdisciplinary background and the substantial experience he has gained in both Asia and Europe, Roger has been involved in a number of complex and high-profile distressed transactions and turnarounds. His commitment to being at the top of the profession is demonstrated by the fact that he was awarded the prestigious designation of Fellow of INSOL International, besides being a member and executive of various other leading restructuring bodies, such as ATTA - Asia Turnaround and Transformation Association.

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