Entertainment &
Sports Capital Raises
THE LAW SUMMIT
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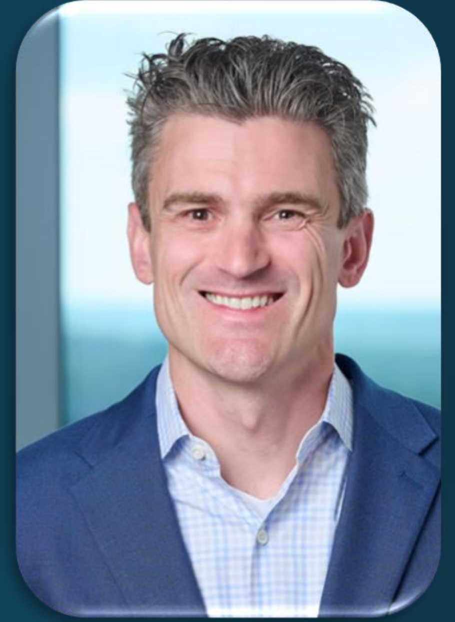
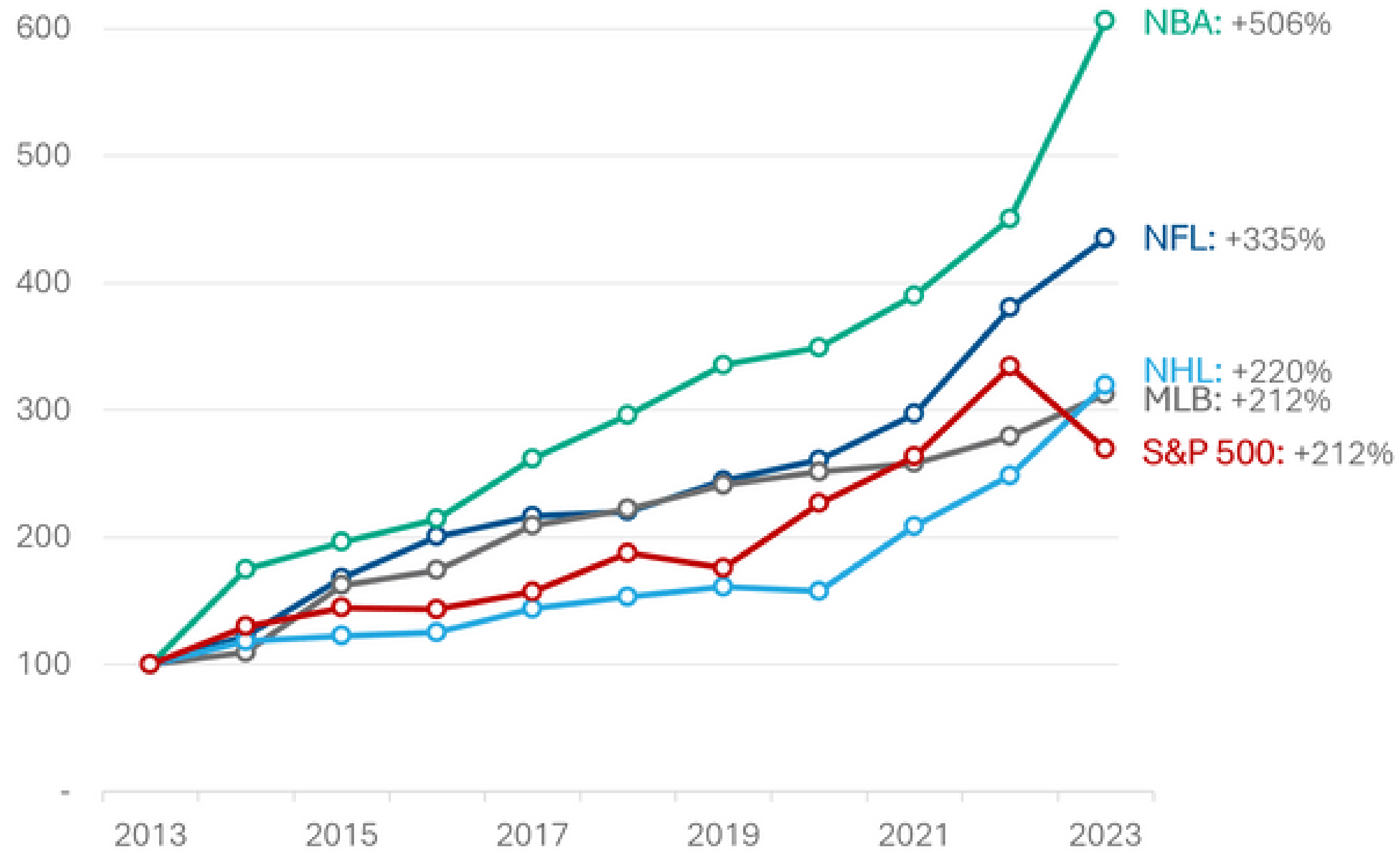
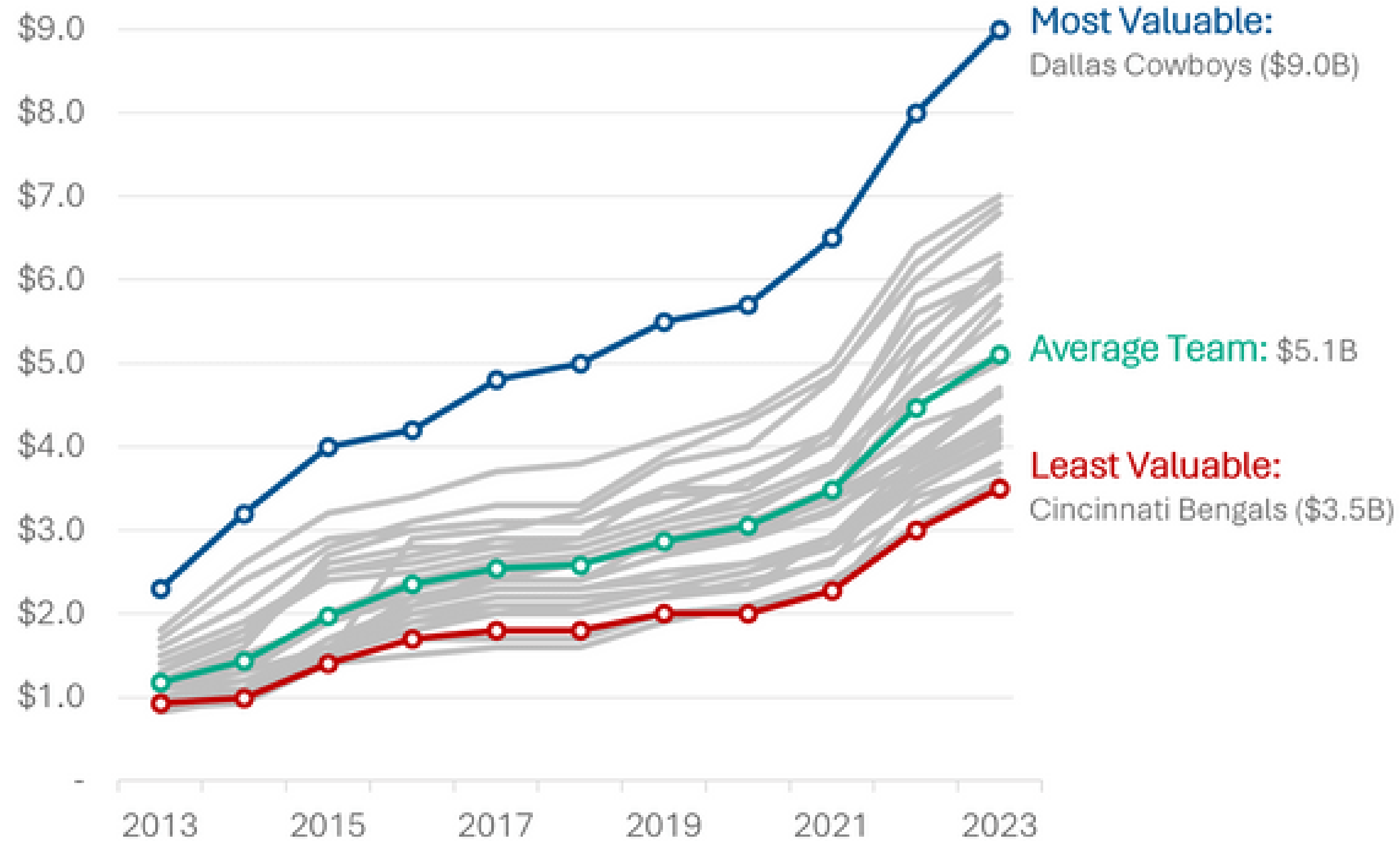


Chris Benner
Bennett Thrasher

Monetizing Assets:
Perspectives of IP
Holders & Institutions

The Rise of Private Equity


Valuation Progression
Values in USD Billions
600
500
400
300
200
100
-
2013
2015
2017
2019
2021
2023
NBA: +506%
NFL: +335%
NHL: +220%
MLB: +212%
S&P 500: +212%
Source: Forbes.
Note: S&P valuation based on start of calendar year.


NFL Team Valuations
Values in USD Billions
$9.0
$8.0
$7.0
$6.0
$5.0
$4.0
$3.0
$2.0
$1.0
-
2013
2015
2017
2019
2021
2023
Most Valuable:
Dallas Cowboys ($9.0B)
Average Team: $5.1B
Least Valuable:
Cincinnati Bengals ($3.5B)
Source: Forbes.

Michigan Ross School of Business and Arctos Launch Pioneering Sports Franchise Index

Business Wire
Tue, Jun 4, 2024 at 8:30 AM EDT • 5 min read

MICHIGAN ROSS

First-of-its-kind partnership provides authoritative benchmark for measuring the North American sports franchise market

DALLAS & ANN ARBOR, Mich., June 04, 2024--(BUSINESS WIRE)--The Stephen M. Ross School of Business at the University of Michigan is collaborating with Arctos, a private investment firm, to present the Ross-Arctos Sports Franchise Index. The index will serve as a tool for assessing the aggregate value and performance of North American sports franchises that comprise Major League Baseball, the National Basketball Association, the National Football League, and the National Hockey League.

The Ross-Arctos Sports Franchise Index, conceived by Arctos and Danny Sillman, CEO of Relevant Sports Group and business partner of Stephen Ross, is backed by proprietary data sets comprising hundreds of individual control and non-control transactions in the 'Big Four' leagues since 1960 to estimate a time series of average returns. By combining Arctos' deep industry

Key Considerations for Private Equity Companies and Rights Holders in the Purchase and Sale of Music Catalogues

Private Equity in the Music Space

Private equity has made its presence known in the music space in recent years through several meaningful, industry-disrupting acquisitions and fund formations, such as:

- Primary Wave’s acquisition of an 80% stake in the music catalogue of Stevie Nicks for ~ $100 million in 2020;
- KKR’s purchase of Kobalt Capital's music rights portfolio for $1.1 billion in 2021; and
- Blackrock’s partnership with Warner Music Group to invest $750 million in Influence Media to acquire catalogues from female and diverse artists in 2022.

Private Equity in the Music Space

Considerations when negotiating with private equity investors:

- Does the private equity group have experience in holding and managing the asset class? What is its reputation?
- Private equity has traditionally made control investments in businesses which they hold for a period of time and ultimately dispose of through a sale at a later date.
- Private equity generally grades itself on internal rate of return. The internal rate of return is determined by taking into account the initial equity investment by investors, the cash return received by investors over the life of the investment and in connection with the sale of the asset, the duration of time between the initial investment and returns, and the cost of investment (including interest) used in connection with facilitating the acquisition. The use of leverage can enhance an internal rate of return. While the most important levers in determining the internal rate of return are the initial purchase price and ultimate cash return, interest rates and time matter.

Private Equity in the Music Space

Is the investor a private equity investor fund or a family office?

- Private equity funds usually have a limited time horizon for their investments. As a fund reaches its end of life, there is incentive by the fund to dispose of assets. Although recently some funds have turned to continuation funds as an alternative to liquidating assets to third parties at the end of the life of the fund, such transactions are complex and difficult to achieve for smaller funds.
- Family offices generally do not have the same end of life concerns. Family offices offer more flexibility than private equity investments as they do not have multiple limited partners with different investment horizons.
- Control is a major issue. If you are selling only a portion of your rights to a private equity group, consider who will control the assets and the inherent needs of private equity investors in connection with negotiations.

Private Equity in the Music Space

- Note that only four years ago the U.S. Treasury Yield was 0.7% and the S&P Dividend Yield was 1.8%. We are in a markedly different macroeconomic and interest rate environment at the present time.
- Absent an assumption that a portfolio will increase revenues at the end of the projected tail of revenues for the life of a song(s), the increased interest rate environment has had an affect on the value of catalogues and has had a mitigating affect on transactions over the last two years.

Value Proposition of Private Equity Investment in Music Catalogues

Notwithstanding elevated interest rates for debt capital and macroeconomic headwinds, investment in music catalogues can be an attractive proposal for many private equity companies for a variety of reasons. For example:

- Music catalogues offer a stable and diversified cash flow stream from royalties generated across multiple platforms.
- Music royalties have consistently demonstrated strong resilience and consistency notwithstanding broader market volatility, as music consumption remains high and largely unaffected by market trends.
- Streaming revenues, which have already seen explosive growth in recent years, are well positioned for even greater growth as streaming technologies and related platforms mature. Goldman Sachs estimates that streaming revenues are poised to grow to $38 billion by 2030, driven by pricing increases and premiumization. Private equity has always been attracted to investments with stable recurring revenue. Think about alarm companies or other subscription models. They are often rolled up by private equity.

Value Proposition of Private Equity Investment in Music Catalogues

- Private equity investors can leverage their market access and operational capabilities to source and capitalize on attractive opportunities post-acquisition, including by pursuing licensing deals in film, TV, advertising, cover songs and video games.
- Private equity investors are uniquely positioned to optimize transaction costs and payment efficiencies associated with royalty collections by building payment networks and infrastructure to facilitate the receipt of payment from end users.
- Music royalties offer a unique way for private equity firms to diversify their portfolios through investment in an alterative asset class with low correlation and high yield.
- Music rights have recently appreciated, and such increased value may be unlocked if the investment holding period of the applicable private equity company is sufficiently long. However, this has not always been the case. Consider the first Bowie Bonds which were downgraded to almost junk status but ultimately repaid.
- Music royalties may operate as an inflation hedge, as they are linked to the demand for music content, which has shown tremendous growth, even throughout the COVID-19 pandemic. However, the prototypical tail for projected royalty income for a song shows a marked decline after the first two years followed by a small decline for the remainder of life.

Investment in Music Catalogues – Key Considerations for Private Equity Companies

For PE sponsors, deploying capital into a music catalogue requires an evaluation of the risk profile, the ROI and the operating expenses of managing a portfolio post-acquisition. Some of the key drivers are:

- **Valuation**: Music catalogues are often valued by their historical and projected royalty cash flows, the appeal and staying power of the music in question, the market demand for the music in question and the likelihood of maximizing the value of the portfolio post-closing.

Investment in Music Catalogues – Key Considerations for Private Equity Companies

- **Due Diligence**: It is crucially important to validate the ownership and enforceability of the intellectual property to be acquired. This can be especially challenging in the music context as music rights are often multi-layered, and several different parties may hold performance rights, publishing rights and recording rights to the same song. Sponsors should also review the terms of any existing contracts, and the existence of any litigation or claims (such as those raised by the heirs of the artist in question) that could impair the rights or the value of the catalogue. Challenges or other issues with respect to copyrights could also be a significant due diligence concern.

- **Asset Management**: Sponsors must have the resources and infrastructure in place to trace, collect and distribute royalties from their catalogues. Sponsors also may seek to enhance the value of their catalogues through strategic transactions, including licensing deals with platforms such as social media, e-fitness products and streaming sites.

Investment in Music Catalogues – Key Considerations for Selling Rights Holders

The sale by an artist of his or her music catalogue requires an evaluation of personal objectives, the financial benefits and the emotional attachment to the work. Some of the key drivers are:

- **Liquidity**: The sale of a music catalogue can provide artists with a significant cash payment, which may be used for a variety of valid purposes, including investing in new ventures, diversifying their wealth and estate planning purposes or simply funding their lifestyle. Further, there may be important tax benefits to the seller of a music catalogue as the sale proceeds are typically taxed at a capital gains rate, whereas royalties are typically taxed as ordinary income.
- **Reducing Administrative Burden**: Monetizing a music catalog may relieve musicians from the burden of the arduous and expensive process of tracking and managing the collection of their royalties. Musicians that sell their music catalogues may also avoid potential disputes or infringement allegations involving their catalogs, as the buyer would assume the liability and risk of enforcing and protecting the rights in such catalogues.

Investment in Music Catalogues – Key Considerations for Selling Rights Holders

- **<u>Control</u>**: Divestiture of an artist's music catalogue often entails the loss of creative control over how such artist's music is used. For example, the buyer may enter into license deals to allow an artist's music to be used on platforms that are inconsistent with the artist's values (including political campaigns or controversial advertisements). Further, it is possible that the sale of an artist's catalogue will lead to a change in the public's perception of the artist, and thereby have a (potentially negative) impact on the artist's credibility and reputation with the public. However, partnership with the right buyer may unlock new avenues for monetization of a catalogue, as such buyer may be able to leverage its relationships with television and movie studios, streaming platforms, gaming producers and other market players to increase the public's exposure to the artist's music.
- **<u>Future Earnings/Timing</u>**: Artists that sell their music catalogues forgo the potential long-term income generated by their catalogues. This is especially so if their songs become widely renowned in the future. However, an artist that chooses to retain ownership rights may miss a potential sale window when valuation multiples are high and the artist's music is at its most popular.

Key Considerations for Private Equity Companies and Rights Holders when Investing in Sports Franchises

Entrance of Private Equity (PE) into Sports

- 2000s – CVC Capital Partners acquires Formula One; American funds Colony Capital, Butler Capital and Morgan Stanley acquire majority stake in Paris Saint-Germain; and several institutional owners make investments in European soccer teams.
- 2019-2021 – Major League Baseball (MLB), National Basketball Association (NBA), National Hockey League (NHL) and Major League Soccer (MLS) permit PE to own minority stakes in teams.
- 2024 – National Football League (NFL) owners vote to allow select PE firms to invest up to 10% of a team's stake.

Today, over 64 major North American sports teams have PE connections.

Why Sports Investments?

- **Uncorrelated Asset**: Sports investments are uncorrelated to other asset classes in that franchises generally generate cash flows in a recession. In other words, less overall volatility. This has not always been the case. It was not unusual for sports franchises to operate at deficits 15 years ago and for owners to routinely receive "cash calls" in small markets without meaningful revenue sharing.
- **Potential for Growth**: Brand value, sponsorship, enhanced fan experiences, media rights and growth potential have led to a surge in franchise valuations.
  - Franchises in the MLB, NBA, NHL, MLS and NFL were worth an average of nearly $3.2 billion last year and growth valuations have generally outpaced the S&P 500 over the past couple of decades.

Limits on Private Equity Investments in Sports Franchises

- Because of the rapidly increasing value of sports franchises, owners of sports franchises confronted an issue of a declining pool of financially available buyers for their franchise or portions thereof.
- Sports leagues over the last decade have progressively allowed private equity to invest in sports franchises, with the most recent entrant being not the National Football League (NFL).
- Unlike the music business, each league is put in significant constraints on private equity investments in sports franchises.
- Investments are generally limited from 10% to 30% of the franchise. Private equity is in essence relegated to a silent partner and may not have control over the franchise. However, that does not mean that private equity may not have the ability to influence management decisions over the franchise in a manner that might be welcomed by ownership.

Limits on Private Equity Investments in Sports Franchises

- Franchises are generally required to hold their investment for a given amount of time (at least six years).
- There are limits on the number of franchises that a private equity group may own interest in (the NFL limits such ownership to no more than six franchises).
- Leagues must approve a private equity investor before it may make investments in the league.
- Unlike music, sports franchises are generally poor cash flow assets and can incur large losses. Losses from a partnership, as non-control investments may be limited by passive activity rules, at-risk rules, and a partner’s basis in the ownership interest.
- A PE Fund acquiring a minority stake may prefer their investment be structured so they can obtain a step-up in the assets owned by the team and therefore be able to depreciate and amortize certain of those investments for tax benefits.
- Remember, not all sports investments have the same risks. Premier league soccer clubs can lose tremendous value if relegated to a lower league irrespective of the positive macro climate for soccer investments.

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When private equity firms and business owners need an attorney who can command the respect of a room and cut through roadblocks to achieve their goals, they call on Mark Solomon. Mark, managing partner of Katten's Dallas office, immerses himself in his client's businesses, treats their problems as his own and leads transactions to the finish line. His clients are his partners and his familiarity with his client's goals and operations keeps him one step ahead of the competition.

Mark and his team don't need a learning curve, which gives his clients an advantage in the fast-paced world of M&A. Clients rely on him to negotiate effectively to get optimal pricing and terms, and they appreciate his personal touch on matters large and small. He also handles securities and corporate finance work for businesses of all sizes, including public companies.

As managing partner of Katten's Dallas office and former national managing partner and CEO of an AmLaw 100 firm, Mark is a business lawyer who understands the needs of his clients. He has been on both sides of the table and understands the unique business environment of North Texas, while representing clients with operations all over the world. His personal relationships with leaders throughout the community give him further insights into relevant business forces in the region and beyond.

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Tax Considerations in
Raising Capital

Summary Agenda

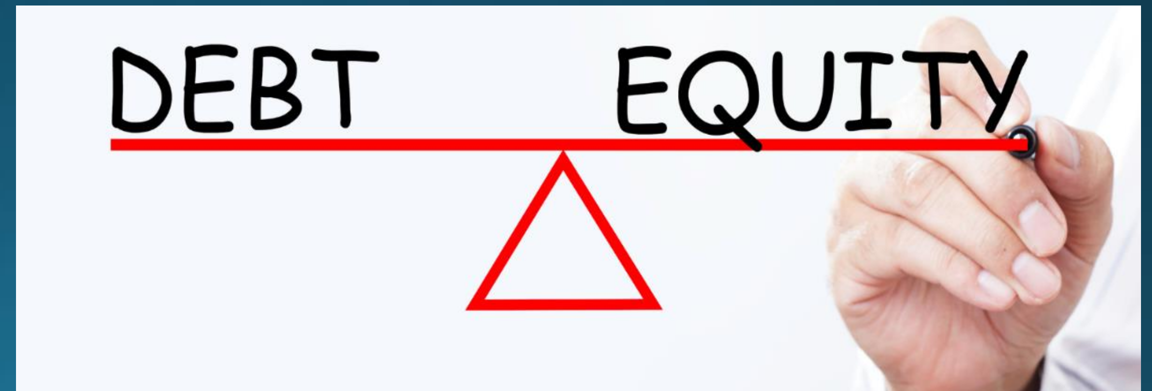
- General Tax Considerations when Raising Capital
- Investor, owner, and talent tax considerations

General Tax Considerations

- Debt vs. Equity
- Offshore vs. Onshore
- Choice of Entity
- Incentive Equity
- Special Tax Incentives

Tax Aspects of Debt vs. Equity

- Tax Aspects of Debt vs. Equity
- Equity and Equity Like Instruments
  - Preferred vs. Common Stock
  - SAFE Agreements
  - Profits Interests/Phantom Stock
- Debt
  - Straight Debt
  - Convertible Loan Notes



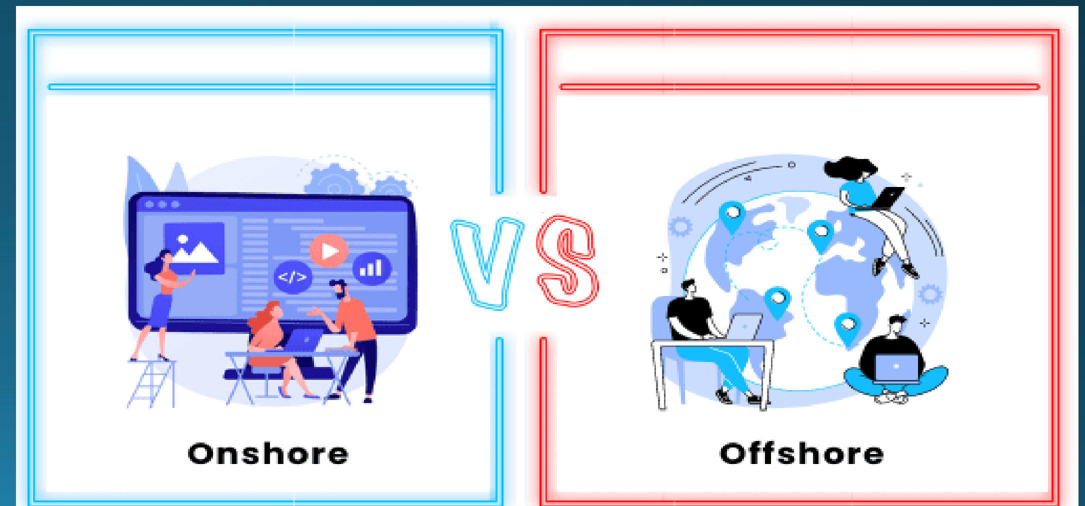
Offshore vs. Onshore

Onshore Raising

- Tax implications are relatively simplified, only considering US taxes (at least initially)

Offshore Raising

- Offshore vehicle needed to mitigate overall worldwide tax exposure for non-US investors
- More complexities on US side with offshore investors; mandatory withholding/disclosures, onerous penalties for noncompliance, etc.



Choice of Entity

C Corp Structure or Flow through?

C corp

C corporation is a company taxed separately from its owners. The entity does business and pays taxes on its profits (i.e., income tax). It's also subject to the same employment taxes (Social Security, Medicare, etc.) as other business types in the U.S.

vs

S corp

S corps are significantly more limited than C corps, and several of those limitations can be particularly troublesome for tech companies hoping to scale. However, the IRS sees them as pass-through entities. That means the S corp can pass profits and certain losses onto their shareholders.

Special Tax Incentives

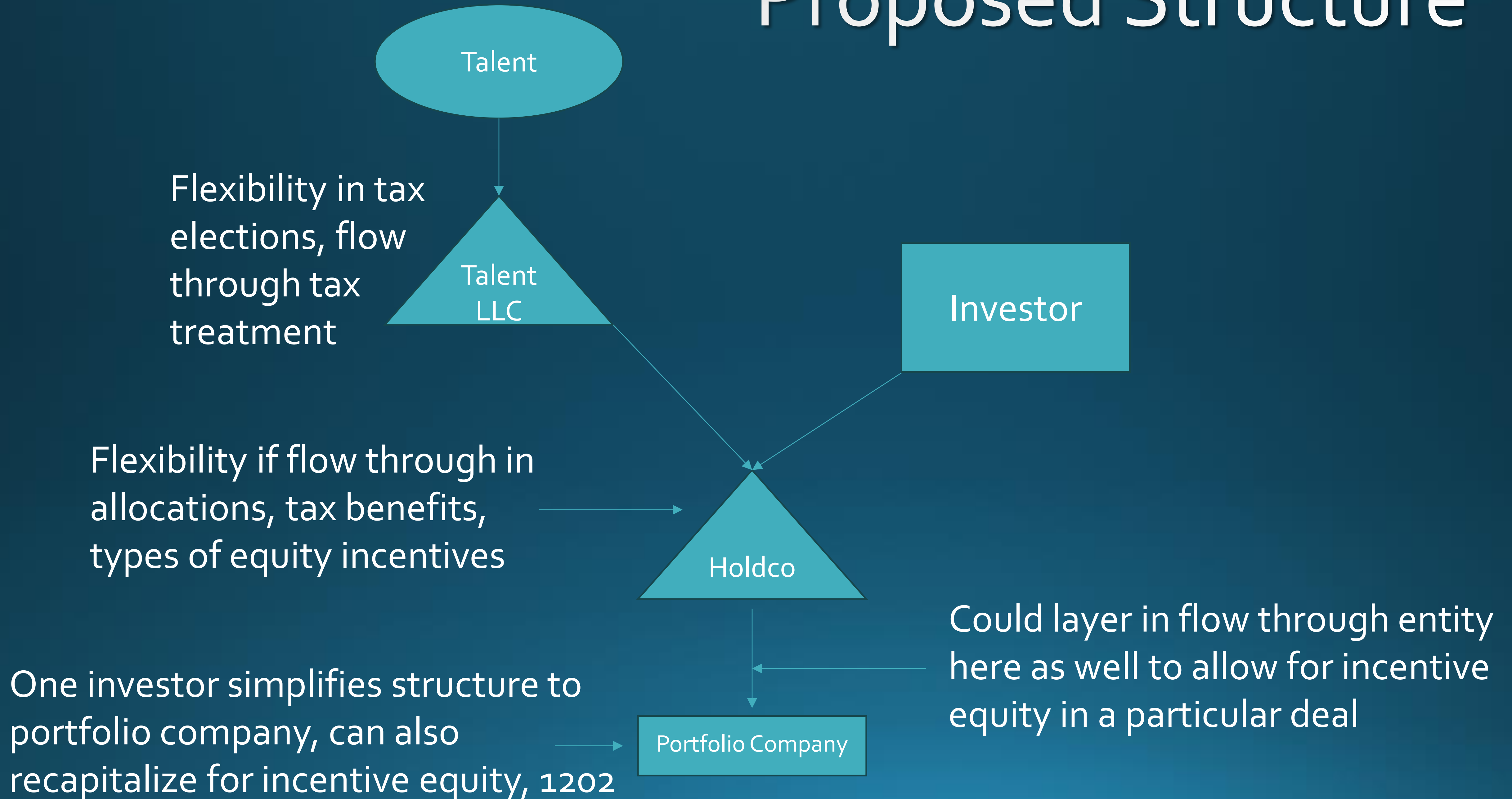
- Section 1202
- Research and Development Credits
- Opportunity Zones
- Taxation of IP Sales Generally

Case Study

Institutional Investor $100MM to invest in portfolio companies to develop and sell portfolio brands in spirits – tax considerations for the parties involved:

Talent

Portfolio Companies


Proposed Structure
Talent
Flexibility in tax elections, flow through tax treatment
Talent LLC
Investor
Flexibility if flow through in allocations, tax benefits, types of equity incentives
Holdco
Could layer in flow through entity here as well to allow for incentive equity in a particular deal
One investor simplifies structure to portfolio company, can also recapitalize for incentive equity, 1202
Portfolio Company

Summary

Investor:

- 1202 eligibility, R&D credits, C Corp less concerned about taxes

Talent:

- Taxes important - structure impacts them!
  - Equity type important

Portfolio Company:

- Taxes less important but still a factor

Entertainment & Sports Capital Raises

businesswire

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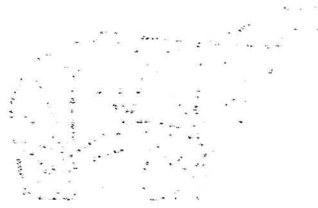

ARCTOS

MICHIGAN ROSS

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insights and applied research with Michigan Ross' academic excellence and integrity, the index will provide key insights and analysis to potential investors, as well as the broader financial and sports business communities. Additionally, the Ross-Arctos partnership will encourage more academic research and thought leadership around all aspects of sports business operations for the benefit of students and faculty.

"We are thrilled to partner with the team at Arctos to build upon their unique and market-leading presence in the professional sports investment business," said Sharon Matusik, Edward J Frey Dean of Business at Michigan. "Our shared goal is to combine Arctos' industry knowledge and experience with Michigan Ross' deep analytical capabilities and academic rigor to establish such an index."

Arctos, founded in 2019, was established to bring more than just capital to the teams, leagues, and businesses it partners with. By using data science-backed insights paired with deep operational and domain expertise, Arctos has quickly emerged as a catalyst for innovation within professional sports and private markets.

"Unlike other private asset classes, the professional sports sector has lacked a shared, consistent, methodical measure to benchmark overall asset class performance, individual league performance and individual investor performance. This index represents a significant milestone for institutional investment in the sports asset class and is the culmination of our team's continued hard work and data-centric approach," said Ian Charles, co-founder and co-managing partner of Arctos. "We're proud to partner with the University of Michigan's Ross School of Business, whose academic excellence and leadership in finance and sports business made it the ideal partner for this initiative."

"Stephen Ross is one of the most creative and forward-thinking builders in global sports," said Sillman. "It is exciting and appropriate that this innovation, which will significantly impact our industry, is housed at the Ross School of Business."

This month, Michigan Ross launched a new website that includes sports franchise performance trends and research data. Additionally, the website will feature key insights from several Ross faculty members, including Chris Rider and Clay Miller. Rider and Miller have expertise in entrepreneurship and private equity, respectively.

"We believe the Ross-Arctos Sports Franchise Index will materially demystify the risks and clarify the unique opportunities involved in investing in professional sports franchises," said Clay Miller, Michigan Ross faculty director for the index. "We are

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- The value of North American sports assets included in the index have compounded at 13.0% per annum for over the last 60+ years, outperforming the equity market by 2.5%.
- According to several measures of risk, North American sports assets included in the index possess risk/return characteristics superior to other traditional and alternative asset classes.

In addition, as of our inaugural quarterly report on the index (as of Q1 2024), notable updates are:

- North American sports assets included in the index have returned 4.8% quarter-to-date, 28.1% year-to-date and 16.7% three-years-to-date.
- Year-over-year, North American sports assets have outperformed global equities (23.8%), U.S. small cap stocks (19.7%), private credit (8.8%), private equity (6.0%), commodities (1.5%) and fixed income (1.3%).
- Year-over-year, the U.S. media and entertainment sector (53.6%) and U.S. equities (29.9%) outperformed North American sports assets included in the index.

For more information about the partnership, visit michiganross.umich.edu/rasfi.

About Arctos

Arctos is a private investment firm that provides bespoke growth and liquidity solutions, differentiated thought partnership, and value creation advice to sports franchises (Arctos Sports) and alternative asset managers, their funds, and portfolio companies

(Arctos Keystone). Founded in 2019, Arctos serves as a catalyst for innovation and business transformation for its portfolio companies and its markets. The firm's proprietary approach is anchored by its unique quantitative research and data science platform, Arctos Insights. Arctos has a team of more than 50 investment and operational professionals with investment and operating expertise across industries, geographies, and economic cycles. The firm is headquartered in Dallas, with office locations in New York, and London. For more information, visit www.arctospartners.com or Arctos' company page on LinkedIn.

About Stephen M. Ross School of Business at the University of Michigan

The Stephen M. Ross School of Business at the University of Michigan is a diverse learning community grounded in the principle that business can be an extraordinary vehicle for positive change in today's dynamic global economy. The Ross School of Business mission is building a better world through business. Through thought and action, members of the Ross community drive change and innovation that improves business and society.

Michigan Ross is consistently ranked among the world's leading business schools. Academic degree programs include the Bachelor of Business Administration, Full-Time MBA, Part-Time MBA (Online and Weekend formats), Executive MBA, Master of Accounting, Master of Business Analytics, Master of Management, Master of Supply Chain Management, and PhD. In addition, the school delivers programs for individuals and custom executive education programs targeting general management, leadership development, and strategic human resource management. For more information, visit MichiganRoss.umich.edu.

View source version on businesswire.com: https://www.businesswire.com/news/home/20240604505425/en/

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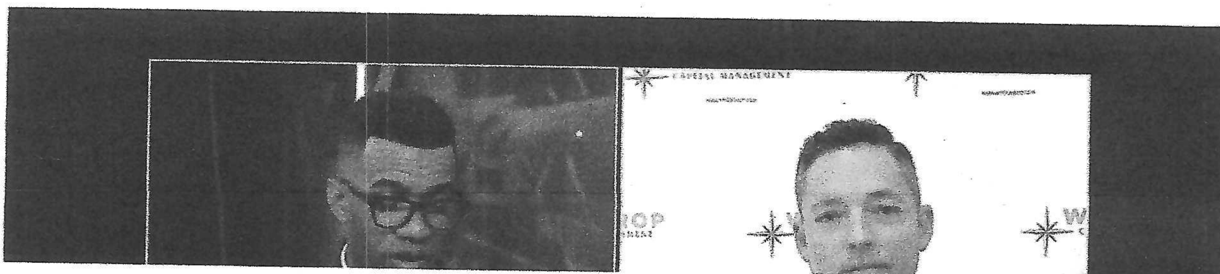
Nvidia begins trading Monday after 10-for-1 stock split



Ross-Arctos Sports Franchise Index (RASFI)

Methodology

May 2024

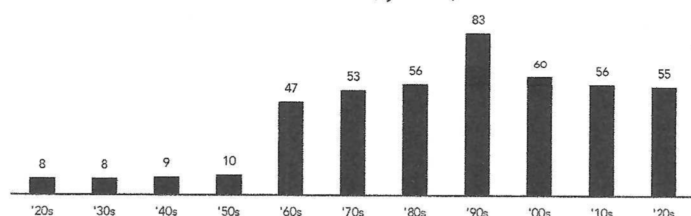
Introduction

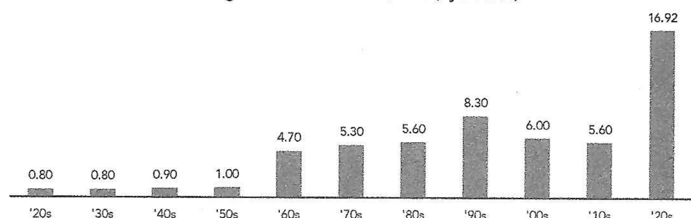
Ross-Arctos Sports Franchise Index (RASFI) represents the first-ever purely data-driven benchmark of investment performance of North American sports franchise assets. RASFI serves sports industry investors, asset owners, league and team executives, and the wider sports business community as a universal standard for investment performance in the largest North American leagues (the "Big Four"): Major League Baseball (MLB), National Basketball Association (NBA), National Football League (NFL), and National Hockey League (NHL).

Sports franchises are privately held assets that trade in an opaque, illiquid market. Recognition of sports franchises as an alternative asset class, akin to private equity, venture capital, or infrastructure, has brought increased focus from investors and allocators on the drivers of sports franchise valuations. We hope RASFI furthers this understanding.

Figure 1.

Decade	Yrs	Transactions	Annual Average	Average TEV
'20s	10.00	8	0.80	0.01
'30s	10.00	8	0.80	0.02
'40s	10.00	9	0.90	0.51
'50s	10.00	10	1.00	0.78
'60s	10.00	47	4.70	4.88
'70s	10.00	53	5.30	10.27
'80s	10.00	56	5.60	40.12
'90s	10.00	83	8.30	147.77
'00s	10.00	60	6.00	311.06
'10s	10.00	56	5.60	858.70
'20s	3.25	55	16.92	2,194.41
Full Sample	**103.25**	**445**	**4.31**	**455.60**
Research Sample ('60s+)	**63.25**	**410**	**6.48**	**494.46**





Source: Arctos, U. Michigan Ross. As of May 2024.

Data[1]

Our full data set comprises over 445 transactions within the Big Four beginning in 1923. Our transaction data set includes all documented full and partial control and non-control transactions, as well as expansion franchises for which expansion fee data is available.

Our main variable of interest is the Franchise Value (Total Enterprise Value)

[1] There can be no assurances that historical trends described herein will continue. Although Arctos and Ross believe that the determinations related to the industry market described herein are reasonable, they are inherently subjective in nature. Other market participants may make different determinations relating to the market based on the same underlying data.

implied by the transaction.[2] Data is predominantly sourced from proprietary transaction data sourced by Arctos, collaboration with sports leagues and public sources including press releases, news articles, and other sources, where transaction information representing Total Enterprise Value or information from which Total Enterprise Value could be readily estimated was available. We believe this data is subject to meaningful and unavoidable noise in the process of reporting; however, as we review, our methodology seeks to explicitly correct for measurement error introduced by the reporting process.

Our research sample excludes the earliest four decades, where information was particularly thin. Transaction rates have been consistent since 1960 (~50-60 per decade) and have grown considerably in the first three years of the 2020s.

Methodology

Our goal is to produce a high frequency (quarterly) estimate of the average Big Four Franchise Value (Total Enterprise Value) using our main sample of 410 transactions. In addition to Franchise Value, we have sparse estimates of prior season franchise revenue and market size (Metropolitan Statistical Area population in millions), with more consistent data availability for revenue beginning in 1980. We use revenue and market size as our main covariates.

We utilize two methodologies, driven by data availability.

State Space Model (1991+). For observations after 1991, where we have consistently available covariate data, we use rolling 30, 40, 50, and 60-trailing window panel regressions using revenue, market size, a non-control dummy, and league as a fixed effect. Given low sample sizes and the time-varying regression horizon, we utilize these four models and take a simple average of the model predictions to improve robustness.

$$\log(V_T) = \gamma_0 + \gamma_1 \log(Rev_T) + \gamma_2 \log(Mkt_T) + (NonControl = 1) + League\ F.E. + \varepsilon_T$$

The average adjusted R^2 across all windows and transactions T is 0.791; average adjusted R^2 across all windows and transactions T over the last ten years is 0.875.

We then define the observed Average Franchise Value in month t AFV_t as the model-predicted Franchise Value of the "average franchise", i.e., using the simple average prior season revenue and estimated market size (MSA population) as inputs, setting $NonControl$ equal to zero, and using the average league fixed effect as our intercept.[3] The result is a sparse monthly time series of imputed AFVs over 388 months beginning in December 1991 (221 missing months).

Our imputed AFV is slightly higher than the observed data (Figure 2). This is driven by skewness in the distribution of revenues and market sizes across franchises in the same league and the time-varying premium earned by control transactions (which is what RASFI aims to measure); a small percentage of our sample

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[2] Total Enterprise Value is defined as the total value of all outstanding corporate equity and debt liabilities.

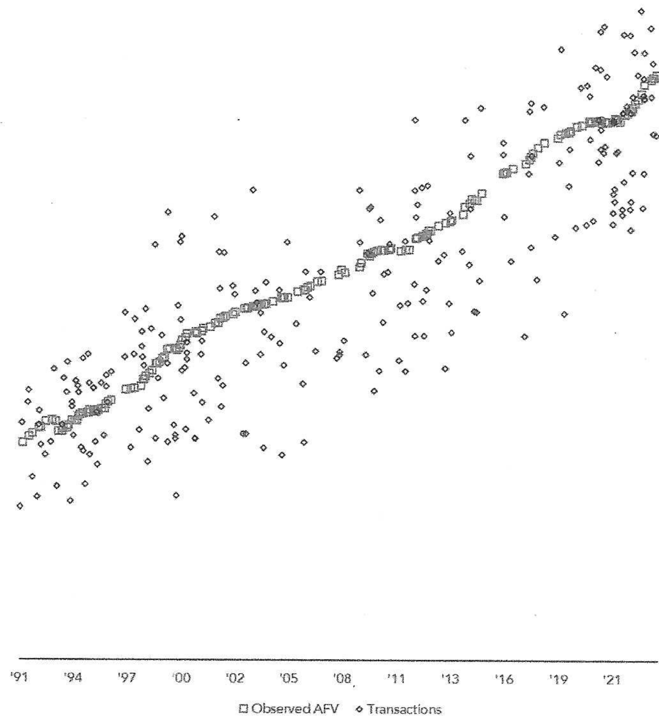
[3] Our data sources are as follows: public sources for estimates of franchise revenue (Forbes, Sportico, public releases of historical financial statements, and internal estimates); U.S. Census Bureau for market size estimates (population) by Metropolitan Statistical Area (MSA).

represents non-control transactions that tend to transact at a discount relative to control transactions (all else equal).

To create a quarterly index, we utilize a linear Gaussian state space model and use a standard Kalman filter to estimate average franchise value as a latent state. Our model is simple and based on the following observations:

1. We believe that best barometer of overall industry health is total revenue (growth), which is itself not particularly correlated with other macroeconomic, financial, or asset price variables.
2. Simple tests of contemporaneous market return in a similar filter model result in factor loadings insignificantly different from zero – i.e., short-term market price movements do not have a significant influence on sports valuations.

Figure 2. Average Franchise Value vs. Actual Data (log scale)



As such, our state space model, which we estimate monthly, is as follows:

$$v_t = v_{t-1} + w_t + \eta_t, \quad \eta_t \sim N(0, \sigma_\eta^2)$$

$$v_t^{obs} = v_t + \varepsilon_t, \quad \varepsilon_t \sim N(0, \sigma_\varepsilon^2)$$

Where $v_t^{obs} = \log(AFV_t/AFV_{t_0})$, v_t is our latent state (the RASFI index value in logs), the random walk drift term w_t is estimated as a linear model of monthly (log) revenue growth:

$$w_t = a + b * \log r_t$$

Where $r_t = Rev_t/Rev_{t-1}$. In other words, we model our monthly transaction observations as a noisy signal of underlying (true) average franchise value, which grows according to a random walk whose trend component is a linear function of average franchise revenue growth.

We estimate $v_t \mid a, b, \sigma^{\eta}, \sigma^{\varepsilon}$ using a Kalman filter. We treat a and b as unknown constants and part of the state space vector. We set our initial state value equal to zero, as it represents a cumulative log return. We use an exact uninformative diffuse initialization for the covariance matrix per the method of Koopman and Durbin (2003), and we assume initial parameters $(a_1, b_1, \sigma^2_{\eta,1}, \sigma^2_{\varepsilon,1}) = (0.3, 1.0, 0.01, 0.01)$. As of initial index launch (March 31, 2024), our model suggests a high and significant b of ~1.152 and unexplained return a of ~0.00259 per month, implying 3.2% annual return above that implied by our revenue growth factor.

Figure 3a. v_t over time

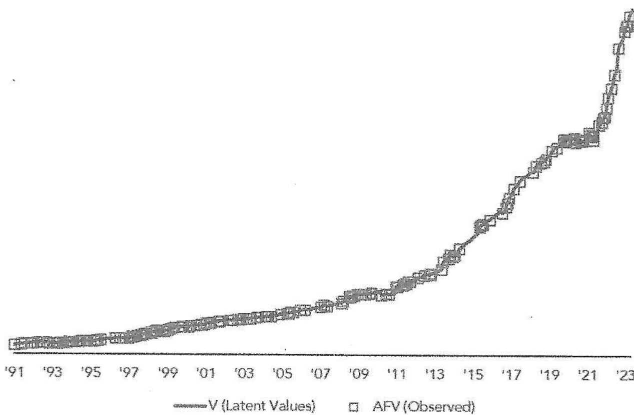
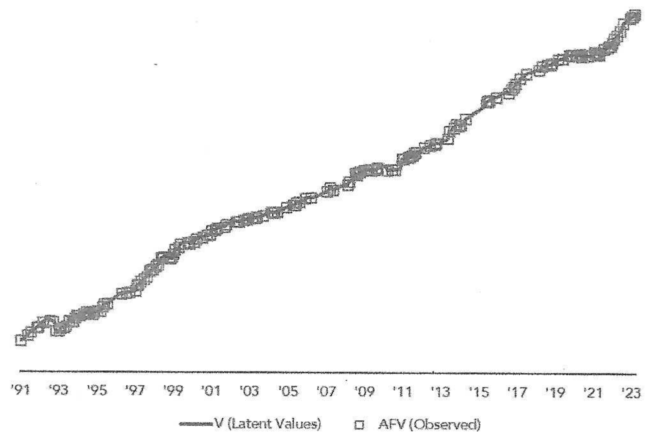


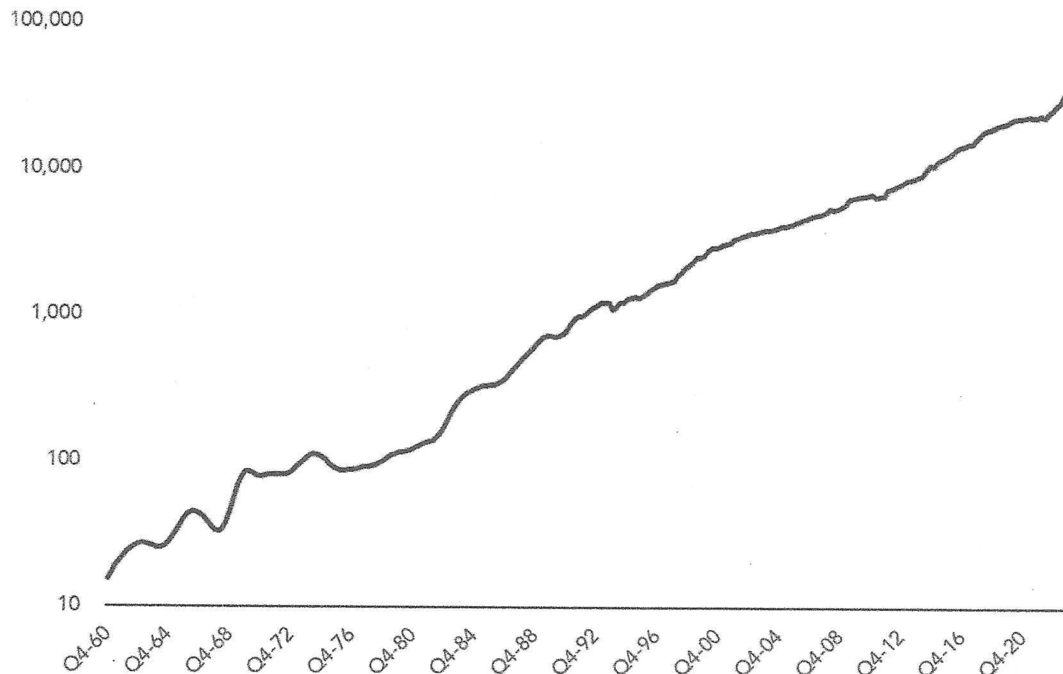
Figure 3b. v_t over time (log scale)



Repeat Sales (Extension back to 1960). We use a Case Shiller method repeat sales model to annually extend the index back to 1960. This extends our index back to December 31, 1960. Our sample includes 277 transaction pairs and ends on December 31, 2023. We then use spline interpolation to create a quarterly result, with the annual coefficients from the initial repeat sales index representing the June 30, YY dates (mid-year). Finally, the resulting index is negatively autocorrelated on an annual basis; hence, we exponentially smooth the result so that serial correlation is zero ($\alpha = 0.6$).

Final Index. The final product is the combination of the Repeat Sales observations to December 31, 1991, followed by the SSM-imputed index, which we track quarterly, starting on December 31, 1991. The December 31, 1991 anchor date value is set to equal 1,000 (Figure 4).

Figure 4. Full RASFI (Dec-91 = 1,000)



Important Considerations

Interpreting movements in RASFI should be done with the following disclaimers in mind:

1. RASFI represents a price return index: it does not capture dividends or net equity issuance / buyback.
2. RASFI is an equally weighted index by construction, with implicit quarterly 'rebalancing'.
3. RASFI is not investible. Our index is an illustrative construction from advanced statistical techniques of the hypothetical performance of the average Big Four franchise.
4. As is common for private asset benchmarks, but unlike most public stock indexes, when RASFI is updated, due to sample updates (incl. backfilled transactions added to the sample), past values of RASFI could change.

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