

PRIVATE & CONFIDENTIAL

November 3, 2015

Alan Halperin, Esq.
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New York, NY 10019-6064

Dear Mr. Halperin:

You have requested Empire Valuation Consultants, LLC (“Empire”) to estimate the fair market value of a 1% limited partnership interest (the “Interest”) in Black Family Partners, LP (“BFP” or the “Partnership”) as of September 3, 2015 (the “Valuation Date”) on behalf of your client, Mr. Leon Black (the “Client”). It is our understanding that this summary letter will be used by you and the Client for estate planning purposes related to GRAT annuity payments.

Valuation Summary

Based on the following review and analysis, and subject to the attached Statement of Limiting Conditions, it is our estimate that the fair market value of a 1% limited partnership interest in Black Family Partners, LP is reasonably stated as \$17,000,000, rounded, as of September 3, 2015.

Methodology

BFP has been valued on a going concern basis. Since the Partnership is closely-held, and thus without a public market for its ownership interests, this appraisal was conducted according to guidelines established by the Internal Revenue Service (“IRS”) and USPAP, and in conformity with the American Society of Appraisers’ Principles of Appraisal Practice and Code of Ethics, together with other standards that were deemed relevant to this engagement.

This summary letter is by its nature a “Restricted Use Appraisal Report” under Standards Rule 10-2 of USPAP. As such, it does not contain the required disclosures regarding the nature, history, outlook, ownership, or other factors regarding BFP, nor does it contain details regarding the valuation analyses considered and used. Therefore, it is for the exclusive use of you, the Client, and the Client’s advisors who have the requisite knowledge to understand the risks, opportunities, and the valuation theories and analyses discussed and applied in this situation.

For purposes of this report, fair market value is defined in accordance with Treasury Regulations established for income, estate and gift taxes as the price at which ownership interests would change hands between a willing buyer and a willing seller, neither being under any compulsion to buy or sell and both having reasonable knowledge of relevant facts.

Sources of Information

Information used in determining the fair market value of the Interest was provided by the documents and sources listed below:

- A copy of BFP’s Amended Limited Partnership Agreement, dated May 17, 2007 as amended December 2009 (the “BFP Agreement”);
- A copy of BFP’s pro forma tax returns, prepared from Mr. Leon Black’s personal tax returns, for the years ending December 31, 2010 through 2012;
- A copy of BFP’s internally prepared financial statements for the years ended December 31, 2013 and December 31, 2014;
- Documents and information regarding BFP’s assets include the most current available: (1) capital account statements; (2) K-1 statements; (3) operating agreements, including amendments; and (4) financial statements;¹
- Conversations and correspondence regarding BFP, its management policies, financial status and investments with Mr. Richard Joslin, BFP’s CFO, and Mr. Richard [REDACTED] of BFP (collectively referred to as “Management”); and

¹ See Appendix A for a list of defined terms regarding BFP’s investments and key agreements reviewed in this report.

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- Other reviews, analyses, and research as were deemed necessary.

Partnership Profile

BFP operated as an investment holding company. The Partnership was formed on May 17, 2007. As of the Valuation Date, the Partnership's primary asset was an interest in BRH Holdings LP ("BRH"). BRH owned 89.20% of AP Professional Holdings LP ("Holdings"), which held 44.17% of the Apollo Operating Group ("AOG") units.² The Partnership was also invested in co-investment funds managed by Apollo Global Management LLC and its consolidated affiliates (the "Company" or "Apollo"). In addition to the Apollo co-investment entities, BFP was invested in additional private investment funds and companies. Additionally, BFP has issued multiple promissory notes.

Based on capital account balances available as of the Valuation Date, the Partnership had a capital account balance of \$2.06 billion, rounded.³ Pro forma financial statements for BFP, compiled using the records of Raich, Ende, Malter & Co LLP for 2010 through 2012 and internally prepared financial statements for 2013 and 2014, are presented in Exhibits A through C.

A. Apollo Operating Group

Apollo was formed as a Delaware limited liability company on July 3, 2007 and completed a reorganization of its predecessor businesses on July 13, 2007 (the "Reorganization"). Apollo is managed and operated by its manager, AGM Management, LLC, which in turn is wholly-owned and controlled by Leon Black, Joshua Harris and Marc Rowan (the "Managing Partners"). Apollo has three primary business segments: private equity ("PE"); Capital Markets ("CM"); and Real Estate ("RE"). See Apollo's public filings for an organizational diagram for Apollo and its ownership structure.

Apollo also entered into an exchange agreement with Holdings that allows the partners in Holdings, subject to the vesting and minimum retained ownership requirements and transfer restrictions set forth in the partnership agreements of the Apollo Operating Group, to exchange their AOG Units for the Company's Class A shares on a one-for-one basis up to four times each year, subject to customary

² Percentages based on Apollo Global Management LLC's 10-Q filing as of June 30, 2015.

³ The Tax Receivable Agreement benefits associated with the AOG Units held by BFP and the July 2007 reorganization of Apollo do not have a stated book value and are not included in the \$2.06 billion total. The value of these assets are included in the valuation section of this report.

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conversion rate adjustments for splits, unit distributions and reclassifications. A limited partner must exchange one partnership unit in each of the ten Apollo Operating Group partnerships to effect an exchange for one Class A share.

On April 4, 2011, Apollo completed the initial public offering (“IPO”) of its Class A shares. Apollo received net proceeds from the initial public offering of approximately \$382.5 million, which was used to acquire additional AOG Units. Shares of Apollo traded between \$18.70 and \$19.30 per share and closed at \$19.01 per share on the Valuation Date, with the mean value being \$19.00 per share.

B. Description of Assets

BFP was invested in cash, marketable securities, multiple Apollo funds, Apollo Operating Group units through BRH and Holdings and non-Apollo investment funds. Details regarding the assets are provided below. A summary of the capital account balance for each interest is presented in Exhibit D.

Cash, Money Market, and Marketable Securities: The Partnership had a checking account and money market funds held at Bank of America with a balance of \$21.0 million as of the Valuation Date. Additionally, BFP had a brokerage account with JP Morgan, which held \$9,433 in cash, \$3.9 million in Apollo Investment Corp.⁴ stock (603,632 shares with a mean value of \$6.46 per share), \$759,020 in Environmental Solutions Worldwide (Ticker: ESWW)⁵ stock, \$1.1 million in AP Alternative Assets, LP⁶ stock (28,730 shares with a mean value of \$36.59 per share). Finally, BFP held \$851,810 in K12, Inc.⁷ stock (66,704 shares with a mean value of \$12.77 per share) as of the Valuation Date.

Apollo Private Equity Investment Funds: BFP participated in Apollo’s PE funds, specifically AIF IV, AIF V, AIF VI, and COF III. For each fund, BFP invested in a related co-investor entity established for Apollo affiliates and employees to participate in Apollo’s individual PE funds. As of the Valuation Date, the Partnership had a capital account balance in ACIV, ACV, ACVI, and ACC III. The Partnership’s co-invest interests were not subject to management or carried

⁴ Apollo Investment Corp. (“AINV”) is a publicly traded business development company (“BDC”) managed by Apollo.

⁵ BFP held 14,389 shares in ESWW. The shares were thinly traded with a most recent closing price of \$52.75 per share.

⁶ AP Alternative Assets, LP (“AAA”) is a publicly traded investment company managed by Apollo. The company is listed on the Amsterdam stock exchange.

⁷ K12, Inc. (“LRN”) was received as an in-kind distribution from BFP’s investment in Knowledge Universe Education [REDACTED].

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interest fees. In effect, they earned the underlying fund's return on investment, net of any non-fee fund expenses.

The AIF funds employed a 1.5% management fee, while COF III employed a 1.25% management fee. For the AIF funds, the management fees could vary based on life-cycle of the fund. The AIF funds and COF III employed a 20% carried interest fee structure. Carried interest was subject to an 8% preferred for its fee-paying limited partners. The fund's limited partners could not withdraw, and transfers required the permission of the respective fund GP entity. The fund size for AIF IV, AIF V, AIF VI, and COF III was \$3.6 billion, \$5 billion, \$10.1 billion, and \$867.4 million, respectively. ACIV, ACV, ACVI, ACC III were bound to invest and divest at the same time as AIF IV, AIF V, AIF VI, and COF III, respectively. AIF IV and AIF V were all on extension in order to liquidate remaining positions. ACIV, ACV, ACVI, and ACC III had no control over the funds, or their selection or timing of investment acquisitions or divestitures. Withdrawal from ACIV, ACV, ACVI, and ACC III was not permitted and transfers required the consent of the respective managing members.

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Apollo Private Equity Co-Invest Entities

Entity	Capital Account Value⁸	Term Expiration
ACIV	\$391,900	The underlying fund was on indefinite extension. There was no indication when the remaining portfolio companies would be sold.
ACV	\$2,213,581	The underlying fund was on contractual extension. There was no indication when the remaining portfolio companies would be sold.
ACVI	\$19,774,934	The fund's term expires January 12, 2016. However, the fund could be extended for two additional years. As of the Valuation Date, it was expected that the fund would extend its term to January 12, 2017.
ACC III	\$8,207,932	The fund's term expires September 11, 2019. ⁹ However, the fund could be extended for three additional years.

Apollo Capital Market Fund Interest: ASC is invested in capital market funds affiliated with Apollo. Apollo's capital market funds held securities from all portions of a portfolio company's capital structure, with a focus on distressed companies. BFP's interest in ASC was not subject to management or performance fees. BFP requested a full withdrawal from ASC on January 25, 2015. According to Management, ASC's agreement terms will result in BFP's withdrawal effective as of February 28, 2016. BFP's capital account balance was \$2.8 million at the Valuation Date.¹⁰

FCI II: BFP made a \$25 million commitment to FCI II on June 21, 2013. FCI II co-invests in Financial Credit Investment II, [REDACTED]. ("FCI Fund") as a Schedule I limited partner. FCI Fund purchased a portfolio of 67 life insurance policies from a European bank with a total policy face amount of \$371 million for approximately \$27 million. The balance of BFP's future capital contributions are expected to be for premiums, fees and expenses. The Partnership's interest in FCI II was not subject to management or carried interest fees. In effect, it earned the underlying

⁸ Based on most recent quarterly account statements. Capital account balances were adjusted to account for distributions and contributions made between the capital account date and the Valuation Date.

⁹ According to the COF III agreement, COF III's term expires on the 5th anniversary of the final close date. The final close date is defined as the initial closing date of January 7, 2013 or the most current subsequent closing date. According to Management, a subsequent closing was completed on September 11, 2014.

¹⁰ Based on the most recent monthly account statement.

fund's return on investment, net of any non-fee fund expenses. BFP's capital account balance was \$14.9 million at the Valuation Date.

FCI Fund employed a 0.5% management fee and 10% carried interest fee structure. The management fees could vary based on life-cycle of the fund. Carried interest was subject to a 6% preferred return for its fee-paying limited partners. The fund's limited partners could not withdraw, and transfers required the permission of the fund GP. FCI II had no control over the fund, or its selection or timing of investment acquisitions or divestitures. Withdrawal from FCI II was not permitted and transfers required the consent of the general partner.

AHL: BFP made a \$52 million commitment to AHL on April 21, 2014 to purchase a total of 2.0 million shares at \$26 per share. The first capital call of \$10.4 million resulted in the purchase of 400,000 shares on the date of the commitment. The second and final capital call of \$41.6 million resulted in the purchase of 1,600,000 shares as of April 2, 2015. BFP's capital account balance was \$52.0 million at the Valuation Date.

AHL is a life insurance holding company focused principally on the retirement market and whose business, through its subsidiaries, is focused primarily on issuing or reinsuring fixed and equity indexed annuities. AHL's subsidiaries include Athene Annuity & Life Assurance Company, Athene Life Insurance Company, Investors Insurance Corp, and Athene Life Re Ltd. Products offered by AHL, through its subsidiaries, include: (1) retail fixed and equity indexed annuity products; (2) institutional products, such as funding agreements; and (3) co-insurance and reinsurance arrangements with third party life insurance and annuity providers.

APTP: APTP is a venture capital fund launched by Apollo principals and managing partners. BFP has a nominal capital account balance of \$25,579. The fund has been inactive for years and was not expected to resume investment activities. All remaining assets in APTP were considered side pocket investments.

APSHL: APSHL is an investment fund launched by Apollo principals and managing partners. BFP has a nominal capital account balance of \$0.¹¹ The fund has been inactive and was not expected to resume investment activities. All remaining assets in APSHL were considered side pocket investments.

¹¹ According to the Partnership's 2013 tax return K-1 for APSHL, the Partnership's capital account balance was negative. Therefore, the carrying value was considered de minimis.

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Apollo Ownership Interests: The Partnership has an indirect ownership position in the Apollo Operating Group through AOG Units held through BRH. In total BFP held 92,727,166 AOG Units. At the Valuation Date, Apollo's stock closed at \$19.01 per share, with a mean value of \$19.00 per share. AOG Units could be exchanged for Class A shares at various future dates.¹² The agreements governing the AOG Units are discussed in greater detail below. The impact of the agreement provisions was considered in the estimation of fair market value for the AOG Units. On an unadjusted basis the capital account value of the AOG units was \$1,761,816,154.¹³ This TRA allows BFP to share in the future tax savings provided to Apollo upon the exchange of BFP's AOG Units. In addition to the AOG Units held, the Partnership also received an annual payment from Apollo in connection with the TRA associated with the Apollo ownership sold in the July 2007 transaction which resulted from the reorganization of Apollo and its listing on GSTRUE.¹⁴

Non-Apollo Investment Interests: BFP's other investments included interests in three fixed-term private equity funds, five evergreen hedge funds, five development stage/private companies and multiple promissory notes. All of these investments were non-controlling and non-marketable, and subject to certain restrictions. None of the funds made regular distributions. Each subset is described further below.

Private-Equity Funds: These investments were subject to transfer restrictions (i.e. requires fund general partner consent), and withdrawal was not permitted prior to the end of the fund's term. Distributions were only anticipated upon the harvest of underlying investments, and the timing and amount of distributions would be determined by each fund's manager or general partner. A summary of key information associated with these funds is presented in the following table.

¹² 7.5% of the block of AOG Units became exchangeable on each of March 29, 2013, March 29, 2014, and March 29, 2015.

¹³ Based on the mean value per share of \$19.00.

¹⁴ GSTRUE is a secondary market for qualified institutional and individual investors. Apollo stopped trading on GSTRUE after its public listing in 2011.

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Non-Apollo Private Equity Investments – Key Terms

Entity	BFP's Capital Account Value ¹⁵	Description	Fee Structure ¹⁶	Term Expiration
HAO	\$4,251,787	The fund is focused on investments in Asia, with a focus on China.	2%/20%	12/5/2015 ¹⁷
WCP	\$1,629,472	The fund is focused on active minority investments located in emerging markets, with a focus on BRIC. ¹⁸	2%/20%	2/23/2019
TEN4	\$1,010,023	The fund is targeting \$1 million investments in growth stage "Big Data" companies. Total fund size is \$25 million.	2%/20%	4/1/2023

Hedge Funds: The evergreen funds allowed withdrawal of capital based on a combination of lock-up periods and limited opportunities to withdraw (e.g. annually, quarterly). Although the interests were subject to transfer and other restrictions, the withdrawal rights were considered to be most important. A summary of key information associated with the evergreen funds is presented in the following table.

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¹⁵ Based on most recent quarterly account statements. Capital account balances were adjusted to account for distributions and contributions made between the capital account date and the Valuation Date.

¹⁶ Stated annually, as "management fee percentage/performance fee percentage."

¹⁷ As of the Valuation Date, it was expected that the fund would extend its term to December 5, 2016.

¹⁸ Brazil, Russia, India and China.

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Non-Apollo Hedge Fund Investments – Key Terms

Entity	BFP's Capital Account Value ¹⁹	Description	Fee Structure ²⁰	Withdrawal Date ²¹
ACP	\$18,586,721	Debt focused special situations fund.	1.5%/20%	6/30/2016
CVRF	\$19,626,613	Debt and equity event-driven fund.	1.5%/20%	12/31/2015
KSC	\$1,095,198	Global long/short credit and event-driven fund.	1.5%/20%	N/A ²²
LC	\$26,973,043	Long only equity fund.	1.75%/0%	12/31/2015
MG	\$28,867,183	Arbitrage fund	0% ²³ /20%	12/31/2015

Truckast LLC (“Truckast”): BFP initially invested in iCrete LLC which had developed proprietary technology for mixing concrete. BFP held a Class B interest in iCrete. According to the Partnership’s final 2014 K-1, BFP had a capital sharing percentage of 0.0%. As of the writing of this report, and effective December 5, 2013, Pacific Concrete Technologies, LLC acquired all of the right, title, and interest in and to certain property formerly owned by iCrete, LLC, including 100% of the membership interests of iCrete. Further, on December 5, 2013, Pacific Concrete Technologies, LLC transferred 100% of the membership interests of the company to GKW Holdings. GKW Holdings formed Truckast to hold these interests. Based on Truckast’s 2014 K-1, BFP had a capital sharing percentage of 0.0%. Therefore the value of BFP’s interest in Truckast was \$0.

KUE: Knowledge Universe Education [REDACTED] was a holding company with a portfolio of development stage secondary education companies. The carrying value of BFP’s interest in KUE was estimated to be \$10.5 million. In October 2013, BFP received a \$1.4 million cash distribution and \$0.8 million stock distribution (105,951 shares of LRN from KUE and 75 shares from KU Management). In addition, BFP received a cash distribution of \$4.4 million in October 2014. The KUE Agreement was amended August 9, 2013. In April 2015 KUE reorganized into separate

¹⁹ Based on the most recent monthly account statements.

²⁰ Stated annually, as “management fee percentage/performance fee percentage.”

²¹ Withdrawal date represents when BFP was allowed to withdraw its capital from the underlying fund as of the Valuation Date based on the provisions of the respective underlying fund agreement. This applies only to ACP, CVRF, LC and MG.

²² Entire balance is a side pocket investment. KSC retained \$117,838 from the withdrawal of unrestricted capital for future management fees with respect to the side pocket investment.

²³ There is no management fee. However, partners bear pro rata levels of fund expenses.

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business units to facilitate liquidation of the separate business units. All business units were expected to be liquidated and KUE dissolved by October 2017.

When BFP invested in KUE, the investment also included an investment in KU Management Inc. (“KUE GP”), KUE’s general partner. Based on the initial investment, BFP’s capital contribution was allocated 99.9% to KUE and 0.1% to KUE GP. KUE GP’s carrying value was estimated at \$14,485.

Curation Media: BFP made a capital commitment of \$1.3 million to Curation Media. With an initial closing in late March 2015, BFP made its first contribution of \$650,000. The remaining capital commitment of \$650,000 was contributed in June and July 2015. Curation Media’s purpose is to create, own and operate a music download service involving the playlists of celebrities and other “tastemakers” where a portion of music rental fees will be donated to charity. BFP’s investment in Curation Media was estimated at \$1,300,000 as of the Valuation Date.

ESWW Convertible Notes: ESWW, through its wholly-owned subsidiaries, is engaged in the designing, developing, manufacturing and selling of emissions control technologies. The company also provides emissions testing and environmental certification services with its primary focus on the North American on-road and off-road diesel retrofit market. ESWW manufactures and markets a line of catalytic emission control and enabling technologies for a number of applications. ESWW is focused on the international medium duty and heavy duty diesel engine market for on-road and off-road vehicles, as well as the utility engine, mining, marine, locomotive and military industries. ESWW also offers engine and after treatment emissions verification testing and certification services. In 2013, BFP invested \$2.9 million in ESWW in the form of convertible notes.²⁴ As of the Valuation Date, the ESWW convertible notes have a book value of \$3,069,883, including accrued interest. The notes pay 10% interest that is compounded quarterly and paid semi-annually. The notes will convert at a rate of \$80 per share to common equity on March 22, 2018, or sooner if a majority of the note holders elect to convert the notes to common stock.

Rally Labs: Rally Labs LLC markets and distributes an over-the-counter drug called Blowfish, which is an effervescent, morning-after hangover remedy. BFP invested \$200,000 on June 28, 2013 as part of Rally Labs effort to raise \$2 million in investment capital in order to finance its general business operations and marketing initiatives to support a national rollout. The Partnership bought 20,000 units at a price per unit of \$10.00. The total offering was 200,000 units. The full allotment

²⁴ The total aggregate offering was \$4,596,929.

of units offered by the company represents 25% of the Rally Lab's fully-diluted capitalization. BFP's carrying value was estimated at \$181,277.

Artbinder, Inc.: Artbinder has developed and is marketing a digital platform for art galleries. BFP invested \$9,998 to purchase 1,715 series A preferred shares on May 9, 2014 as part of Artbinder's effort to raise capital for capital expenditures, working capital, and general corporate purposes.

Promissory Notes and Receivables: As of the Valuation Date, the Partnership had the following notes with related parties: (1) two outstanding notes with Leon Black, totaling \$42.1 million, net, including accrued interest; and (2); two notes with PLB LLC totaling \$3.2 million (including accrued interest). Note terms end between March 13, 2016 and September 16, 2016. Annual interest rates are between 0.18% and 0.25% for the notes. All notes are interest only with principal payments due at the end of each note's term.

As of the Valuation Date, the Partnership had a redemption receivable in the amount of \$850,886, a receivable from LBF Holdings, LLC in the amount of \$3,380,880, and a receivable from BRH Holdings, LP in the amount of \$127,695.

Liabilities: BFP had no liabilities at the Valuation Date.

Summary: Based on the most recent capital account statements and holdings information provided by Apollo and BFP Management, the Partnership's total assets had an aggregate market value of \$2.1 billion (which excluded the TRA benefit). Since BFP had no liabilities, its aggregate partners' capital was \$2.1 billion (based on the mean value per share for each of the marketable securities as of the Valuation Date). See Exhibit D.

Valuation adjustments necessary to reflect the market value of the Partnership's individual assets taking into consideration various restrictions that hinder BFP's control over the assets and lack of a ready market to dispose of or trade its assets is considered in detail in the valuation section of this report.

C. BFP Agreement Provisions

BFP was formed pursuant to Delaware Revised Uniform Limited Partnership Act (the "Act"). The BFP Agreement dictates the rights, responsibilities and restrictions placed on the Interest. A summary of key provisions impacting the fair market value of the Interest is presented below.

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- **Management:** The Partnership shall be managed solely at the discretion of the GP (i.e. Black Family GP, LLC). (7.1-7.2.) No LP shall have the ability to act on behalf of the Partnership in its capacity as such. (7.6.) There are no restrictions on the actions of the GP, and the GP may not be removed. (7.4.) Upon an event of withdrawal by the GP, a successor GP shall be appointed by a majority in interest of the LPs. (7.7.)
- **Allocations and Distributions:** [REDACTED] allocations shall be made on a pro rata basis. (5.2.) The timing and amount of distributions shall be determined by the GP in its sole and absolute discretion. Such distributions are based on sharing ratios. (5.4.)
- **Costs:** Any costs incurred by the GP on behalf of the Partnership for its operations shall be reimbursed by the Partnership. (Article 4.)
- **Restrictions on Transfer:** Transfers of economic interests are permitted. However, no transferee shall become a partner without the prior written consent of the GP. (9.1.) Upon death, a partner's economic rights shall be transferred to his legal representative. (9.3.) In addition to the required consent of the GP, other administrative tasks must be completed in order to effect the admission of a transferee as a substitute LP. (9.4.)
- **Restrictions on Withdrawal:** Any Partner may withdraw any portion of his, her, or its capital account at any time. Upon such withdrawal, the Partnership shall distribute to such Partner assets of the Partnership with an aggregate fair market value equal to (i) the value of all of the assets of the Partnership, multiplied by (ii) such Partner's Sharing Ratio, multiplied by (iii) the percentage of such Partner's capital account being withdrawn by such Partner. If the Partnership's assets consist of assets other than cash or marketable securities, the FMV shall be determined by a qualified appraiser selected by the GP. (3.4.)
- **Books and Information:** The GP shall cause complete books and records to be maintained at the principal offices of the Partnership. Such records shall be open to inspection and examination of all partners in person or by their duly authorized representatives, who have the right to make copies at their own expense during normal business hours. (8.1.) The GP may, but is not required to, have annual financial statements prepared. Such statements need not be audited. If prepared, copies of such statements shall be delivered to the LPs. (8.2.) The Partnership's accountants shall prepare all federal, state and local income tax returns for the Partnership. (8.3(a).)

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- **Dissolution:** The Partnership will be dissolved at such time as the first of the following should occur: (1) the bankruptcy or dissolution of the GP; (2) the determination of the GP to dissolve the Partnership; (3) the entry of a decree of judicial dissolution; (4) any event under the act sufficient to cause dissolution. (10.1.)
- **Amendment:** The Agreement may only be amended by the unanimous agreement of the Partners. (12.1.)

AOG Unit Agreement Provisions

The Interest and AOG Units are subject to provisions of multiple agreements. The impact of these agreements is that the value of an AOG Unit will vary from the value of a share of Apollo's Class A stock, based on the restrictions and benefits imposed on the AOG Units. Transfer and exchange restrictions remove the ability to participate in a liquid market. The TRA outlines how the tax benefit derived from an AOG Unit exchange is shared between the exchanging unit holder and Apollo.

Empire reviewed the key agreements, as well as the summary for each agreement that is included in Apollo's public filings. The descriptions provided below are paraphrased from the content provided in the filings, and are intended to have the meaning conveyed therein.

A. The Exchange Agreement

BFP entered into an exchange agreement with Holdings which provides for the exchange of AOG Units owned by Holdings for Class A shares of Apollo. Subject to certain procedures and restrictions²⁵ and upon 60 days' written notice prior to a designated quarterly date, each of Holdings' owners²⁶ has the right to cause Holdings to exchange the AOG Units owned indirectly by such owner for BFP Class A shares. The Class A shares received in the exchange would then be sold immediately at the prevailing market price, or at a lower acceptable price, and the net proceeds distributed to the owner affecting the exchange. In connection with the exchange, BFP's interest in the AOG Units will be correspondingly increased and the voting power of the Class B share will be correspondingly decreased.

²⁵ Restrictions include the vesting schedules applicable to the Managing Partners, as well as any applicable transfer restrictions and lock-up agreements.

²⁶ Including Managing Partners, contributing partners, and certain transferees thereof.

B. The Principals Agreement

The Principals Agreement provides that each Managing Partner's Pecuniary Interest²⁷ in the AOG Units that he holds indirectly through Holdings shall be subject to vesting. The Managing Partners own Holdings in accordance with their respective sharing percentages. Pursuant to the Principals Agreement, the AOG Units attributable to each of the managing partners is fully vested as of the Valuation Date.

C. The Shareholder Agreement

While the Exchange Agreement allows for quarterly exchanges of AOG Units into Class A shares of BFP, the Shareholder Agreement restricts the amount and timing of such exchanges involving a Managing Partner's aggregate equity interest ("Equity Interests") via its transfer restrictions. These restrictions are described below.

No Managing Partner²⁸ may affect cumulative transfers of Equity Interests, representing more than:

1. 0.0% of his Equity Interests at any time prior to the second anniversary of the date on which the registration statement of which the S-1 forms a part became effective (the "shelf effectiveness date"), i.e. March 29, 2011;
2. 7.5% of his Equity Interests at any time on or after the second anniversary and prior to the third anniversary of the shelf effectiveness date;
3. 15% of his Equity Interests at any time on or after the third anniversary and prior to the fourth anniversary of the shelf effectiveness date;
4. 22.5% of his Equity Interests at any time on or after the fourth anniversary and prior to the fifth anniversary of the shelf effectiveness date;
5. 30% of his Equity Interests at any time on or after the fifth anniversary and prior to the sixth anniversary of the shelf effectiveness date; or
6. 100% of his Equity Interests at any time on or after the sixth anniversary of the shelf effectiveness date.

²⁷ Pecuniary Interest - With respect to each Managing Partner, the number of AOG units that would be distributable to such Managing Partner assuming that Holdings were liquidated and its assets distributed in accordance with its governing agreements.

²⁸ This applies to Managing Partners and their permitted transferees.

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Certain transfers were not subject to the restrictions described above, including transfers: (1) from one founder to another founder; (2) to a permitted transferee of such Managing Partner; and (3) in connection with a sale by one or more of the Managing Partners in one or a related series of transactions resulting in the Managing Partners owning or controlling, directly or indirectly, less than 50.1% of the economic or voting interests in Apollo or AOG, or any other person exercising control in Apollo or the AOG by contract, which would include a transfer of control of their manager.

D. Tax Receivable Agreement

In the event that an exchange pursuant to the Exchange Agreement is a taxable transaction, Apollo Management Holdings, [REDACTED], and the AOG entities that it controls will make a Section 754 election which may result in an adjustment to the tax basis of a portion of the assets owned by the AOG at the time of the exchange. The taxable exchanges may result in increases in the tax depreciation and amortization deductions from depreciable and amortizable assets, as well as an increase in the tax basis of other assets, of AOG that otherwise would not have been available. A portion of any increase in depreciation and amortization tax deductions, as well as the increase in the tax basis of such other assets, will reduce the amount of tax that APO Corp. would otherwise be required to pay on future income.

Additionally, Apollo's acquisition of AOG Units in such an exchange may result in increases in tax deductions and tax basis that reduces the amount of tax that APO Corp. would otherwise be required to pay in the future. This occurred in connection with the Apollo's acquisition of AOG Units from the Managing Partners in the strategic investors' transaction in July 2007.

The TRA requires APO Corp. to pay the Managing Partner (or to a permitted transferee of such Managing Partner, i.e. BFP) or contributing partner involved in such an exchange 85% of the amount of actual cash savings, if any, in U.S. Federal, state, local and foreign income tax that APO Corp. realizes²⁹ as a result of these increases in tax deductions and tax basis, and certain other tax benefits, including imputed interest expense. APO Corp. expects to benefit from the remaining 15% of actual cash savings, if any, in income tax that it realizes.

²⁹ Or is deemed to realize in the case of an early termination payment by APO Corp. or a change of control.

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For purposes of the TRA, cash savings in income tax will be computed by comparing APO Corp's actual income tax liability to the amount of such taxes that APO Corp. would have been required to pay had there been no increase to the tax basis of the tangible and intangible assets of the applicable AOG entity as a result of the transaction and had APO Corp. not entered into the TRA. The tax savings achieved may not ensure that APO Corp. has sufficient cash available to pay the tax liability or generate additional distributions to its investors. Also, APO Corp. may need to incur additional debt to repay the TRA if its cash flows are not met.

The term of the TRA will continue until all such tax benefits have been utilized or expired, unless APO Corp. exercises the right to terminate the TRA by paying an amount based on the present value of payments remaining to be made under the agreement with respect to units that have been exchanged or sold and units which have not yet been exchanged or sold. The present value of remaining payments will be determined based on certain assumptions, including that APO Corp. would have sufficient taxable income to fully utilize the deductions that would have arisen from the increased tax deductions and tax basis and other benefits related to entering into the tax receivable agreement.

No payments will be made if a Managing Partner or contributing partner elects to exchange his or her AOG Units in a tax-free transaction. In the event that other of Apollo's current or future subsidiaries become taxable as corporations and acquire AOG Units in the future, or if Apollo becomes taxable as a corporation for U.S. Federal income tax purposes, each will become subject to a tax receivable agreement with substantially similar terms.

Valuation of Black Family Partners, LP

A. Introduction

Generally, there are three commonly used approaches, to determine the value of a company/asset, none of which is necessarily superior to the others. These three approaches are the Income, Market and Cost Approaches. The nature of the business, industry, and economic circumstances of the particular company/asset being valued at the specific valuation date, as well as the availability of data will dictate which approach(es) will ultimately be used in determining the company's/asset's value.

B. Valuation Methodologies Applied

1. Income Approach

Discounted Cash Flows Methodology (“DCF”): The discounted future income methodology can use cash flows as a basis to forecast the income which the business or asset will generate. Thereafter, an aggregate present value is calculated for the future cash flows using a required rate of return known as the discount rate. The strength of this methodology is that it facilitates the analysis of operational practices and their impact upon the business’ value. Its weakness, however, is that it relies heavily upon projections of cash flows or net income which, for some firms, are difficult to make with any accuracy.

The DCF method was applied to value certain BFP assets represented by expected future cash flow sources. For BFP, as an investment holding company, an asset based approach was considered more appropriate.

2. Market Approach

Guideline Company Methodology: The objective of the guideline company methodology is to identify business entities that have publicly traded securities, as well as business and financial risks, which are comparable to those of the entity being valued. The pricing multiples of the selected public companies are then used to derive a market value for the owners’ capital of the company under analysis.

For an investment holding company, comparison with similar publicly traded investment companies, such as closed-end funds, is generally considered appropriate. There are two important pricing multiples that can be derived from the freely traded shares in investment holding companies: (1) discount to net asset value (“NAV”); and (2) price to yield. Discount (or premium) to NAV is calculated by dividing the company’s market price by its reported NAV per share, and then subtracting the result (as a percentage) from 100%. A discount to NAV is also referred to as an investment company discount (“ICD”). The other important pricing measure for public investment holding companies, particularly for those that earn substantial income (e.g., municipal bonds, utility stocks, commercial real estate) and pay out most of this income, is yield (i.e., the dividend per share divided by the market price per share). When either of these pricing measures is applied to the closely held investment company’s corresponding financial figures, the end result is the fully marketable value of owners’ capital on a non-controlling (i.e., minority) interest basis.

This methodology was applied, in conjunction with a variant of the NAV method, described below, to derive the fair market value of BFP.

3. Asset Accumulation Method

The asset accumulation method (“AAM”) focuses primarily on the balance sheet. It requires restatement of the company’s assets and liabilities in order to reflect their market values. Using this method, the value of the subject enterprise’s equity is equal to the market values of its assets less its liabilities. The general method of individual asset and liability revaluation has also been referred to as the net asset value method, the adjusted net asset value method, the adjusted book value method, and the asset build-up method.

Application of this method will typically indicate the value of 100% of the subject company equity on a controlling ownership interest basis. However, the method’s relevance generally weakens when valuing an operating company whose value is best reflected as a going concern. Exceptions are when sale of the company’s net assets is considered highly probable, when the realizable value of its net assets equals, or exceeds, the value of its distributions to its owners, or when the company’s value is tied directly to the value of its underlying investments.

Note that unless otherwise noted, use of this method assumes that transaction and built-in gains tax costs are reflected in the consideration of the discounts for lack of control and marketability.

Because the Interest is an investment in an investment holding company, the value of its underlying assets and any related liabilities are important to an investor. This is true even though a minority interest is being valued, and such an interest obviously does not have the right to liquidate the Partnership or its assets. Therefore, the AAM was used to determine the minority value of the Interest.

C. Valuation Summary

The AAM was used to value the Interest. First, the adjusted book value of BFP’s assets (except cash and marketable securities) were calculated. The summary of which is presented in Exhibit D.

The assets were placed in three groups. The first group consisted of the interests in fixed-term funds,³⁰ most of which were not expected to liquidate for several years after the Valuation Date. The most recent available capital account balances were

³⁰ ACIV, ACV, ACVI, ACC III, HAO, WCP and TEN4.

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used as a starting point, reflecting the pro rata NAV in each fund associated with the subject interests. A restriction period discount was then applied to reflect the rights and restrictions associated with each investment, together with its economic characteristics. Application of this adjustment resulted in a cash equivalent value (i.e. fair market value) that was included in the derivation of BFP's adjusted book value ("ABV"). This analysis is presented in Exhibits E-1 through E-3.

The second group consisted of BFP's interest in the capital market funds.³¹ The capital market investments, i.e. hedge funds, are subject to risk³² between the Valuation Date and their earliest possible withdrawal dates. One quantitative method to assist in determining the restriction period discount applicable to the subject interests is to estimate the costs that would be incurred by an investor if he were to attempt to "hedge" his position over the restriction period. In other words, if an investor is restricted from selling his interest should he change his outlook (or the stock price begins dropping), he would want protection (a hedge) from potential losses that could be incurred during the restriction period, yet would not want to give up the upside potential, as that is the reason for the investment in the first place. This provides a reasonable tool to estimate at least the liquidity-related portion of the restriction period discount. However, it was considered that this method of estimating a restriction period discount would only result in a "floor" value for the discount. Several factors contribute to this, including, but not limited to, the following: (1) to the extent that they are available, volatility metrics for hedge funds are generally based on monthly (not daily) reported data, which may lead to a smoothing of volatility measures over time; (2) volatility metrics based on historical investment returns only provide a measure of the historical risk of the underlying investment portfolio, but do not measure the business risk of the fund itself; (3) these measures do not account for risks associated with the fund general partner's right to suspend or curtail withdrawals in certain situations; (4) such an analysis cannot capture the adverse impact of a gate, which generally limits withdrawals to a certain percentage of fund assets; and (5) perhaps most importantly, public investment vehicles that would be required for an investor to implement a perfect hedge against an illiquid asset such as a hedge fund interest simply do not exist. Despite these complications, a theoretical put option model was considered as one indicator to use in estimating a restriction period discount for the unrestricted portions of the capital market interests. In addition, certain restricted stock data was also considered, largely because the put

³¹ ASC, FCI II, AHL, APTP, APSHL, ACP, CVRF, KSC, LC and MG.

³² Risks included factors that could affect future performance of each fund. Risk factors may include, but are not limited to, the fund remaining a going concern, the fund maintaining the same investment strategy, regulatory issues, or a change in investment manager.

option model implicitly does not account for certain risks outlined above. The put option model and the restricted stock data are discussed further below. This analysis is presented in Exhibits F-1 through F-3.

Additionally, the fair market value of AOG Units held by the Partnership was estimated based on a restricted stock analysis that employed a put option model to estimate a restriction period discount applicable to the AOG Units and the TRA benefit payable to BFP pursuant to the TRA agreement. A DCF analysis was employed to value both the existing TRA payment stream and potential future TRA benefit from the AOG units held by BFP at the Valuation Date. These analyses are presented in Exhibits G-1 through H-2.

Once BFP's adjusted book value was estimated, the pro rata ABV associated with the Interest was calculated. Next, a combined discount for lack of control and lack of marketability was applied to estimate the fair market value ("FMV") of the Interest.

Valuation of Fixed-Term Fund Interests

In assessing the fair market value of the Partnership's underlying PE fund investments the capital account balance associated with each interest was used as a starting point. An appropriate restriction period discount was then applied to account for the economic characteristics of the interest, its performance, and the investment risks associated with the underlying investment fund, together with the rights and restrictions attributable to the interest as described in the fund's governing documents. Market and general economic conditions at the Valuation Date were also a consideration.

In estimating an appropriate restriction period discount to apply to the Partnership's underlying PE fund investments, we considered the economic and financial risks of each investment as a prospective investor may perceive them. In addition to each fund's vintage year, investment strategy, portfolio composition and other descriptive information provided earlier in this report, several risk factors were considered, including, but not limited to, the following: (1) remaining term; (2) stage of lifecycle; (3) remaining capital commitment; (4) cumulative returns; (5) distributions; (6) preferred returns to limited partners, if any; and (7) potential carried interest payments to the general partner, if any. The general impact of each on the selected restriction period discount is discussed below.

On a relative basis, estimated restriction period discounts would be greater for funds with: (1) longer remaining terms, which would also suggest that the funds were

earlier in the fund cycle and could have greater investment risk; (2) larger unfunded capital commitments, which could reduce the number of potential buyers;³³ (3) capital appreciation as the expected source of value creation, as investors in funds expected to create value through cash flow (i.e., debt service income or rental income) were likely to receive distributions earlier than investors in otherwise similar funds that were invested for capital appreciation; (4) lower distributions as a percentage of contributed capital and net multiples of contributed capital, both of which could suggest a lack of strong historical performance; and (5) no preferred return, which would provide less of a return to limited partners before carried interest payments could be made to general partners or managers.

In selecting a reasonable restriction period discount to be applied to each of the Company's underlying private investments, several benchmarks were considered. These included, but were not limited to, the following: (1) discounts to NAV associated with publicly-traded closed-end investment companies ("CEICs"); (2) restricted stock studies; and (3) the limited market data available for the private equity interests in the secondary market. Each is described further below.

- **CEIC Samples:** Two closed-end fund samples were developed: (1) business development companies ("BDCs") and CEICs invested in underlying private equity investments; and (2) capital appreciation securities. The BDC sample included eight domestic closed-end funds invested primarily in mezzanine debt, private equity and venture capital securities. Implied discounts to NAV ranged from 4.6% to 41.3%, with mean and median observed discounts of 21.4% and 19.0% for the sample. Note that equity focused funds ranged from 32.7% to 41.3%. The capital appreciation sample had implied discounts that ranged between 5.4% and 16.6%, with mean and median implied discounts of 11.7% and 13.4%. Note that the CEICs in the capital appreciation sample invested in publicly traded equity securities. See Exhibits I-1 and I-2.
- **Restricted Stock Studies:** Addendum 4 to this report describes the results of several restricted stock studies which encompass several hundred restricted stock transactions that were completed between 1966 and 2013. Addendum 4 demonstrates that restricted stock discounts have declined over time as Rule 144 resale provisions have become less restrictive. Median

³³ In addition to the fact that the landscape of potential willing buyers would be limited to "accredited investors" in most situations, any potential buyer would need to have the capacity to fund future capital calls.

restricted stock discounts for studies involving transactions completed prior to 1990, involving minimum required holding periods of at least two years, generally range from 25% to 45%. Median discounts associated with these studies are generally concentrated between 30% and 35%.

- **Secondary Market Data:** Median bids for all fund sectors had implied discounts to NAV of 16.9%.³⁴

Application of the PE Analysis: Application of a selected restriction period discount to each PE interest resulted in their respective market values, which were then included in the derivation of the Company's ABV.

BFP's existing PE interest included four Apollo co-invest interests, and three non-Apollo related PE fund interests. Details regarding the funds were presented earlier in the report. All funds had remaining capital that could be called. ACIV, ACV, ACVI, HAO and WCP were only likely to have fund related expenses called. ACC III and TEN4 were recently formed and would have substantial capital calls, relative to their respective commitment, in the next few years. Apollo related PE interests did not pay management or carried interest fees. All of the PE fund interests were restrictive in that transfers were not allowed without the fund general partner's consent and withdrawals were not permitted. The Partnership did not have the ability to influence the future investments or divestitures of its holdings.

The primary risk factor for the interests was the likely remaining term of each fund. The term, in addition to the other risk characteristics of the interests, were considered in the selection of the appropriate restriction period discounts. The following table summarizes the estimated cash equivalent value of the PE interests.

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³⁴ *NYPPEX Holdings, LLC's ("NYPPEX") 2015 Mid-Year Secondary Private Equity Market Trends and Outlook Worldwide*, August 2015.

Selected Restriction Period Discounts

Entity	Remaining Term (yrs.) ³⁵	Capital Account	Selected Discount	Market Value, rounded
ACIV	2.00	\$391,900	25%	\$290,000
ACV	2.00	\$2,213,581	25%	\$1,660,000
ACVI	1.36	\$19,774,934	15%	\$16,810,000
ACC III	4.02	\$8,207,932	35%	\$5,340,000
HAO	1.26	\$4,251,787	20%	\$3,400,000
WCP	3.48	\$1,629,472	35%	\$1,060,000
TEN4	7.58	\$1,010,023	35%	\$660,000

See Exhibit D for summary details of BFP's ABV and Exhibits E-1 through E-3 for PE restriction period discount details.

Valuation of Capital Market Interests

The Partnership has five Apollo related evergreen fund interests (ASC, FCI II, AHL, APTP, and APSHL,) and five non-Apollo related interests (ACP, CVRF, KSC, LC and MG). Empire's analysis began by segregating the capital accounts between unrestricted capital, which had liquidity rights with knowable withdrawal dates, and side-pocket investments, which had no liquidity rights or known term.

A summary of the capital account balance for each capital market fund interest is presented in Exhibit F-1. Also included in Exhibit F-1 is each interest's allocation between side-pocketed investments and liquid investments available for withdrawal proceeds or requests.

Put Option Analysis: The Partnership is subject to risk with respect to the unrestricted capital between the Valuation Date and the earliest possible withdrawal dates. One quantitative method to assist in determining the restriction period discount applicable to the Partnership's underlying investments is to estimate the costs that would be incurred by an investor if he were to attempt to "hedge" his position over the restriction period. In other words, if an investor is restricted from selling his interest should he change his outlook (or the stock price begins dropping), he would want protection (a hedge) from potential losses that could be

³⁵ The terms for ACIV and ACV were past their contractual length, including extensions. Two years was used as an estimate for the period of time required to liquidate the remaining assets of each fund.

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incurred during the restriction period, yet would not want to give up the upside potential, as that is the reason for the investment in the first place. This provides a reasonable tool to estimate at least the liquidity-related portion of the restriction period discount.

However, it was considered that this method of estimating a restriction period discount would only result in a “floor” value for the discount. Several factors contribute to this, including, but not limited to, the following: (1) to the extent that they are available, volatility metrics for hedge funds are generally based on monthly (not daily) reported data, which may lead to a smoothing of volatility measures over time; (2) volatility metrics based on historical investment returns only provide a measure of the historical risk of the underlying investment portfolio, but do not measure the business risk of the fund itself; (3) these measures do not account for risks associated with the fund general partner’s or managing member’s right to suspend or curtail withdrawals in certain situations; (4) such an analysis cannot capture the adverse impact of a gate, which generally limits withdrawals to a certain percentage of fund assets; and (5) perhaps most importantly, public investment vehicles that would be required for an investor to implement a perfect hedge against an illiquid asset such as a hedge fund interest simply do not exist.

Due to these complications, it was considered that the application of an adjustment to each investment’s capital account value based on a put option analysis only captured a portion of the overall risks associated with the investment, and did not result in the fair market value of the underlying investment. Instead, it was recognized that the investments remained subject to material business risks that were not captured by such an adjustment.

Black Scholes Option Pricing Model Description: A put option gives the holder the right, but not the obligation, to sell a stock at a fixed price (a “strike” or “exercise” price) to a buyer. This type of option rises in value as the underlying stock price drops below the price at which the holder can sell it. The greater the drop in price, the more valuable the right to sell the shares at a fixed, higher price, becomes. A put option, with an exercise price equal to the capital account balance as of the Valuation Date, can be used to hedge a stock holding from downward price drops, since the value of the put rises to offset any drop in the stock price. The two assets combined, at expiration, should approximately equal the value of the stock position at the time the hedge was put in place, net of the costs related to the hedge.

The Black-Scholes option model for valuing call options (the right but not the obligation to buy a share of stock at a fixed price) was developed by Fisher Black

and Myron Scholes in the 1970s. The model is widely used in the pricing of options in the public markets, in risk-management (hedging), and in the accounting for compensation options under Financial Accounting Standards Board (“FASB”) guidelines. The model, using short sales and borrowings, reflects results assuming that the option value is equal to the security price, times a probability (that the ending price will exceed the strike price), minus the present value of the exercise price, times a probability.

In valuing a put option, the output of the Black-Scholes model can be modified to determine the probability of a downward movement in a stock’s price over time (relevant to a put), as opposed to an upward movement in the price (relevant to a call). To do so, the model’s probabilities are changed to their reciprocals, and certain signs are changed to make the stock position assumed by the model a short position, instead of a long position with borrowed funds. These adjustments result in a put option model.³⁶

The model has six inputs that determine value: (1) stock price; (2) exercise price; (3) risk-free rate; (4) the life, or term, of the option; (5) expected volatility; and (6) dividend yield. The first three inputs are easily observable; the impact of the last three inputs requires further discussion, as do the manner in which they were derived.

1. **Asset Price:** The value of the underlying asset or stock. In this case, the unrestricted capital account balance of the Partnership’s interest in a fund.
2. **Exercise Price:** The price at which the holder of the option could sell the underlying asset upon exercise of the option. In this situation, the exercise price is equal to the asset price.
3. **Risk Free Rate:** The risk rate used in the model is the continuously compounded risk-free rate for the term corresponding to the length of time remaining on an option. The appropriate yield was benchmarked by the return on U.S. Treasury securities having maturities that correspond with the term of the option. The *Federal Reserve Statistical Release H.15* was used to determine the appropriate risk-free rate.
4. **Term of the Option:** The term, or expected remaining life, of an option also has a significant impact on value. The longer the expected remaining life, the longer the stock has to potentially rise or fall to greater extent,

³⁶ Model based on article by James R. Mountain, *Journal of Accountancy*, January 1996.

making the option more valuable. A longer term option on a high volatility stock can have significant value, whether it is a put or a call option.

In this case, the term would be the period of time between the Valuation Date and the earliest possible withdrawal date after the Valuation Date.

5. **Volatility:** The volatility of the underlying stock price has a significant impact on the value of an option. Volatility is a measure of how far up or down a stock could potentially go over a given period of time, based on the historical day-to-day trading patterns. Higher volatility increases the value of both call and put options. The higher the volatility, the higher the possible profits from owning an option and, hence, the higher the option's value. This relationship is somewhat counterintuitive, as the prospect of high volatility and greater investment risk generally lowers equity prices. The key difference, relative to equity pricing, is the limited downside risk of an option, which gives its owner the right *but not the obligation* to sell.

Empire was provided with historical return and volatility specific to BFP's investments, as well as comparable benchmark hedge fund index returns and volatility were considered in estimating volatility for each subject interest.

6. **Dividends:** Dividend payments impact value, but to a much lesser extent. Dividend payments reduce the value of a call option and increase the value of a put option, because cash flows out of the company to its shareholders but not to the option holders. The net result is that the prospective growth in the stock value of the company is slowed. When dividends are to be paid before the option expires, it is necessary to adjust the formula.

In general, BFP's fund investments did not make regular distributions unless it is associated with investor withdrawals. As a result, dividend yield was assumed to be 0%.

The Black-Scholes put option implied discounts are presented in Exhibit F-2. Other factors were also considered.

Other Factors: The analysis outlined above indicates a theoretical cost of a protective put option of the value of the underlying security. However, the full cost incurred to hedge the value of the capital accounts until they could be redeemed would also include: (1) transaction costs associated with establishing such

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custom put options, or a series of custom put options, over the stated period of time; (2) the financial counter-party in the put transaction would require compensation for assuming the risk associated with incomplete financial information resulting from the investments' private status; (3) payment methods that may be employed by the funds, i.e. payments may not be in cash; and (4) delayed and staggered payment after capital withdrawal from the funds.

The total implied restriction period discount implied by the Black-Scholes put option pricing model and consideration for other factors is presented in Exhibit F-2.

Restricted Stock Data: Restricted stock studies were sought for use in determining one possible benchmark for the discounts appropriate for application to each investment. Relevant restricted stock studies are summarized and described in Addendum 4 to this report.

Overview: The restricted stock studies demonstrate that discounts do exist to compensate investors for their relative inability to liquidate an investment over the course of a given holding period. The statistics associated with the studies fell within a reasonably close range, although variation of implied discounts was noted within each of the studies. Variations in observed discounts were generally attributed to company-specific (i.e., investment specific) factors. The restricted stock study data also supports the notion that discounts declined when holding periods were reduced, which can be anticipated based on accepted financial theory.

Based on these studies, we estimated that the discounts appropriate for lock-up periods of two years could be as high as 33%. While data points underlying the specific studies suggested that discounts could range much higher, it was considered that such high levels of discounts were frequently observed with investments that were subject to high levels of stock price volatility or business risk. As a result, the overall median restricted stock discount of approximately 33% for a two-year holding period was considered a reasonable upper boundary for use in this analysis.

TVA Study – Holding Period Analysis: Addendum 4 includes a description of a study completed by Trugman Valuation Associates, Inc. ("TVA") that was published in the fall of 2009. After a detailed screening process, TVA identified 80 transactions occurring between January 1, 2007 and August 19, 2008. The summary statistics associated with this study are presented at the beginning of Addendum 4.

As a component of its study, TVA completed a holding period analysis by analyzing the impact of contractual registration rights on implied discounts. TVA

indicated that a large majority of the 80 transactions in the study had registration rights. TVA performed additional research to verify the actual registration date, and calculated the number of days between the transaction date and the actual registration date. If no registration statement was filed with respect to a specific transaction, TVA assumed that the securities remained unregistered for the entire required holding period.³⁷ TVA separated this data into quartiles, resulting in the statistics shown in the following table.

TVA Analysis of Registration Rights

Quartile	Days Before Registration	Average Discount	Median Discount	Standard Deviation
1	0-31 days	11.6%	10.0%	8.0%
2	32-63 days	14.3%	12.9%	11.3%
3	64-185 days	20.4%	15.9%	18.4%
4	185+ days	26.9%	18.8%	18.6%

TVA's registration rights analysis suggests that implied discounts are positively correlated to implied holding periods, and provides useful information to assist in the development of benchmark discounts for holding periods up to six months. This analysis implies that holding period discounts even for short periods of time can be relatively significant. Although this information is helpful, the lack of block size and volatility data associated with each quintile makes the data difficult to interpret. For example, registered shares may still be subject to trading restrictions depending on the block size. Therefore, it is not clear based on the published data that the subject blocks of stock would be fully liquid upon registration. Further, discounts are generally recognized to increase as volatility increases, and the data presented does not permit an assessment of the relative impact of volatility on the observed discount.

Analysis of FMV Study Data: Addendum 4 describes the 2013 edition of the *FMV Restricted Stock Study*TM (the "2013 Discount Study") in detail, together with Empire's analysis of the underlying transaction data. To provide some additional data that will assist in developing benchmark discounts to account for the illiquidity of hedge fund investments, we refer to Empire's analysis of stock price volatility on implied discounts. This is considered relevant given the relatively low volatility that may be associated with hedge fund investments in comparison to many of the companies included in the data set.

³⁷ 365 days prior to the change in Rule 144 on February 15, 2008, and 182 days thereafter.

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As described further in Addendum 4, the 779 transactions in the 2013 Discount Study were filtered and sorted based on certain key variables, including volatility. The sorted data included 345 transactions, and was divided into quintiles. The lowest quintile of volatility data had historical stock price volatility ranging from 19.0% to 55.7%, with an average of 42.4%. Implied discounts associated with this quintile ranged from 0% to 84.6%. This quintile reflected a median discount of 13.1%, as compared to a discount of 20.0% for the 337 transactions for which volatility data was available.

Conclusion: The overall restricted stock study data suggests that discounts are clearly applicable to account for lock-up periods during which an investment cannot be sold. The holding period analysis conducted by TVA provided the most relevant data for short periods. However, it must be considered that the underlying securities in these transactions may not be fully liquid upon registration, whereas a hedge fund investor generally has liquidity as of a given withdrawal date. Further, the underlying stock price volatility associated with the transactions in the TVA Study is likely to be higher than the volatility associated with the subject hedge funds. Taking these and other factors into account, we estimated a reasonable range of discounts likely applicable to investments with lock-up periods up to two years. This is shown in the following table.

Estimated Restriction Period Discounts

Lock-up Period	Estimated Discount Range
0-1 Months	1-5 %
1-6 Months	5-7 %
6-12 Months	7-10 %
13-18 Months	11-25 %
19-24 Months	26-33 %

It should be recognized that these estimated ranges are likely to overlap; i.e., the restriction period discount ultimately appropriate to a specific investment is dependent on the attributes of that particular investment.

Application of the Capital Market Analysis: Application of a selected restriction period discount to each capital market fund interest resulted in their respective market values, which were then included in the derivation of the Partnership's ABV.

Side-pocket investments were considered to be more like a PE investment. As such, side-pocket portions of the capital account balances were discounted based on methods described above with respect to PE investments. Note, FCI II had an unfunded capital commitment balance of approximately \$13.3 million. All other investments considered did not have required capital contributions in the foreseeable future. The following table summarizes the estimated cash equivalent value of the capital market interests.

Selected Restriction Period Discounts – Capital Market Funds

Entity	Side Pocket Capital	Unrestricted Capital	Selected Side Pocket RPD ³⁸	Selected Liquid Capital RPD	Market Value
ASC	\$23,303	\$2,755,447	30%	5.00%	\$2,630,000
FCI II	\$14,883,721	\$0	30%	n/a	\$10,420,000
AHL	\$52,000,000	\$0	30%	n/a	\$36,400,000
APTP	\$25,579	\$0	30%	n/a	\$18,000
APSHL	\$0	\$0	n/a	n/a	\$0
ACP	\$0	\$18,586,721	n/a	5.00%	\$17,660,000
CVRF	\$0	\$19,626,613	n/a	4.00%	\$18,840,000
KSC	\$1,095,198	\$0	30%	n/a	\$770,000
LC	\$0	\$26,973,043	n/a	5.00%	\$25,620,000
MG	\$0	\$28,867,183	n/a	4.00%	\$27,710,000

See Exhibit D for summary details of BFP's ABV and Exhibits F-1 through F-3 for capital market fund restriction period discount details.

Valuation of Miscellaneous Interests

A. Valuation of Interest in Truckast

Truckast was a development stage company whose primary product was proprietary software for the concrete industry. As of the Valuation Date, Truckast has yet to be profitable and, according to the accountants review for 2012 financial statements, its ability to survive as a going concern was not certain. BFP had no ability to cause an exit event for the company's current investors and the company had a perpetual term. Additionally, BFP could not sell or transfer its interest in Truckast in the interim without written consent from its managing member. Therefore, the

³⁸ Restriction Period Discount

fair market value of BFP's interest in Truckast was estimated to be \$0. See Exhibit D.

B. Valuation of Interest in KUE

KUE was a development stage holding company whose subsidiaries were for profit education companies for the 'K through 12' level. BFP's capital account balance indicated a price-to-book value for KUE of approximately 0.31 times. Comparable guideline companies have price-to-book ratios between 0.0 times and 6.0 times, with a mean and median of 1.6 times and 1.0 times. Therefore, BFP's capital account balance was considered a reasonable proxy for the fully marketable minority value for the subject interest. BFP had no ability to cause an exit event for the company's current investors and the company had a perpetual term. Additionally, BFP could not sell or transfer its interest in KUE in the interim without written consent from its managing member. KUE did make its first distribution to its investors during the third quarter of 2013. Further, the company is seeking to liquidate all business units and dissolve KUE by October 2017. As such, a combined discount of 20% for lack of marketability and lack of control was applied to BFP's capital account balance of \$10,536,490. Therefore, the fair market value of BFP's interest in KUE was estimated to be \$8.4 million [$\$10,536,490 \times (1 - 20\%)$]. The same discount was applied to BFP's interest in KUE GP, resulting in a value of \$11,588 for the subject interest [$\$14,485 \times (1 - 20\%)$]. See Exhibit D.

C. Valuation of Interest in Curation Media

Curation Media was a development stage company with the purpose to create, own and operate a music download service involving the playlists of celebrities and other "tastemakers" where a portion of music rental fees will be donated to charity. BFP's total contributed capital of \$1,300,000 as of the Valuation Date was considered a reasonable proxy for the fully marketable minority value for the subject interest. A discount of 35% for lack of marketability was applied to BFP's capital contribution of \$1,300,000. Therefore, the fair market value of BFP's interest in Curation Media was estimated to be \$845,000 [$\$1,300,000 \times (1 - 35\%)$]. See Exhibit D.

D. Valuation of Interests in ESWW Stock and Convertible Notes

The ESWW stock had a market price of \$52.75 per share at the Valuation Date. The stock is thinly traded, with a median trading volume of 100 shares per day traded in the six months prior to the Valuation Date. The stock only traded on 41 days over the same period. The company had approximately 130,000 shares

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outstanding. Based on BFP's specific block of stock and control position an illiquidity discount was considered appropriate. Based on the restricted stock studies and TVA study discussed above and the size of the block relative to the depth of the market a 10% discount was considered reasonable. Therefore, the adjusted value of the ESWW common stock held by BFP was \$683,118.

As of the Valuation Date, the ESWW convertible notes have a book value of \$3,069,883, including accrued interest. The notes have a conversion price of \$80 per common share. The notes have an annual interest rate of 10% paid semi-annually in March and September. The notes mature March 22, 2018. The estimated value of the ESWW convertible notes are based on the sum of the conversion value of the notes' face value plus the present value of expected future interest payments. Similar to the illiquidity discount applied to the common stock position, the value of the notes attributable to the conversion value was adjusted to account for its illiquidity and restriction period. Again, the notes would not convert until March 2018. Based on the studies mentioned above and the specific attributes of the ESWW convertible notes, an illiquidity discount of 25% was applied to the market price at the Valuation Date. Based on an adjusted share price of \$39.56 per share the estimated market value of the ESWW convertible notes was \$2.3 million, at the Valuation Date.

E. Valuation of Interest in Rally

Rally was a development stage company whose primary product was an over the counter hangover remedy. BFP had no ability to cause an exit event for the company's current investors and the company had a perpetual term. Additionally, BFP could not sell or transfer its interest in Rally in the interim without written consent from its managing member. As such, a combined discount of 35% for lack of control and marketability was applied to BFP's capital account balance. Therefore, the fair market value of BFP's interest in Rally was estimated to be \$117,830 [$\$181,277 \times (1 - 35\%)$]. See Exhibit D.

F. Valuation of Interest in Artbinder

Artbinder developed and is marketing a digital platform for art galleries. BFP had no ability to cause an exit event for the company's current investors and the company had a perpetual term. As such, a combined discount of 35% for lack of control and marketability was applied to BFP's capital account balance. Therefore, the fair market value of BFP's interest in Artbinder was estimated to be \$6,499 [$\$9,998 \times (1 - 35\%)$]. See Exhibit D.

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Valuation of Apollo Ownership Interests

At the Valuation Date, the Partnership held the following ownership interests in Apollo and the Apollo Operating Group. The mean between the high and the low of Apollo's stock was \$19.00 per share on the Valuation Date.

Apollo Ownership Units

Unit Type	# of Units	Grant Date	Unrestricted Value
AOG	92,727,166	7/13/2007	\$1,761,816,154

The AOG Units were restricted from trading. By definition, restricted shares cannot be considered as marketable as freely tradable shares. Therefore, in order to determine the market value of the units, the impact of these restrictions must be considered and incorporated into the valuation.

Empirical studies indicate that the factors which most influence the size of the lack of marketability discounts applicable to a block of restricted stock are: (1) the length of time which the stock has to be held (time value of money) before sale (resale restrictions); (2) the volatility of the security (risk); (3) the size of the block and the stock's available trading float; (4) the capitalization size and creditworthiness of the corporation; and (5) the outlook for the company, its industry, and its relative position therein.

The analysis for the AOG Units is presented below. A put option analysis, as described previously was applied to estimate the appropriate restriction period discount. Additionally, the TRA benefit associated with AOG Units is considered and valued separately below. The DCF method was applied to value the TRA benefit.

A. Apollo Operating Group Units

The AOG Units were subject to a schedule that restricted their trading established in July 2007 when Apollo was formed through the consolidation of the Apollo operating group. Again, according to the Exchange Agreement, AOG Units would be exchangeable into Class A Apollo shares. Since Apollo had successfully completed its IPO the restriction period had officially begun and the restriction period was known for the Partnership's AOG Units. Based on annual delivery on March 29 that began in 2013 and will go through 2017, a put option analysis could be modeled for each block of AOG Units delivered or available for exchange. As

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of the Valuation Date, BFP's first, second, and third tranches were exchangeable, but due to the insider status of Leon Black and his affiliation with the Partnership, the 20.9 million exchangeable AOG units were still subject to SEC Rule 144 trading restrictions.

Again, the Black-Scholes option pricing model was previously discussed. Specific input parameters used for the put option model are presented in Exhibit G-1. These included: (1) block value; (2) exercise price; (3) term; (4) volatility; (5) dividend yield; and (6) risk-free rate.

An incremental adjustment for other factors not captured by the theoretical implied discount derived from the put option model was added to the implied discount and ranged between 1.0% and 2.0%. Overall, implied discounts for the restriction period imposed on the AOG Units ranged between 8.5% and 18.3%. Applying the implied discounts to the appropriate AOG Unit blocks resulted in a restriction period adjusted market value of \$1.50 billion, rounded, for BFP's AOG Units. See Exhibit G-1.

As noted above, the AOG Units have an associated TRA benefit derived from the tax shield provided upon exchange to APO Corp. The value of the TRA benefit is calculated in the following section.

B. AOG Unit TRA Tax Shield

As with many complex assets, the TRA could be valued using different methods or inputs. In this instance, valuing an explicitly projected future cash flow stream for the TRA, incorporating the myriad of assumptions for Apollo's status upon future conversions (e.g., future share price values, tangible asset values, business segment breakouts related to the TRA, existence and timing of IPO, etc.) was viewed as being highly unreliable and purely speculative in nature. In order to simplify the analysis, it was assumed the exchange occurs immediately at today's price and known facts about the business. A present value for the amortization benefit was then calculated.

Since this derived value would not begin flowing for a number of years (1.6 years on a weighted average basis based on conversion restrictions as discussed earlier), the TRA value was assumed to be locked-up for that period of time. This treats the asset similar to a restricted stock that could, in fact, fluctuate up or down in value over the 1.6 years. The TRA value could go up or down if any of many things, including the following, change: company share price, business mix, tangible versus intangible assets, future interest/discount rates, etc. To account for this

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restriction period, a lack of liquidity/marketability discount was calculated and applied to the present value of the TRA derived below, again similar to the put option analysis approach applied to the AOG Units (excluding the TRA benefit) in the previous section. While one can argue there are other methods one might use, this was considered to provide a reasonable estimate of this portion of the value of the AOG Units.

Projected TRA Cash Flows: In order to complete a DCF analysis, it is necessary to develop an explicit forecast for TRA cash flows, together with a required rate of return by which those cash flows can be discounted back to their present value. The TRA cash flows are derived from the step-up in basis upon the exchange of the AOG Units into Class A shares for sale. Again, according to Management, the basis of the AOG Units is \$0. Therefore, upon an exchange of the Units, the price per Class A share multiplied by the number of Units exchanged for Class A shares represents the step-up in basis.

The value of Apollo's Class A shares is derived from the expected future cash flows attributed to its ownership of APO Asset Co., LLC and APO Corp. However, the tax benefit derived by the step-up in basis upon the exchange of the AOG Units is realized only by APO Corp. According to internal reports provided by Apollo regarding fair value of reporting units in the Apollo Operating Group, APO Corp. accounted for approximately 69.99% of Apollo's value. Consequently, the aggregate value amortizable due to a future exchange is estimated to be \$1.2 billion. This amount is amortizable over a 15-year period, or \$82.2 million per year. This results in an annual tax benefit of \$33.2 million per year based on an effective tax rate of 40.35%. The effective tax rate is based on Apollo's projections for the statutory federal and state corporate tax rates. See Exhibit G-3.

To the extent that APO Corp. does not have sufficient taxable income to fully recognize the amortization expense derived from the exchange, the remaining balance can be carried over as a net operating loss carry-forward until such time as a sufficient taxable income amount is earned where the expense can be charged and a tax benefit realized.

The cash flows attributable to the tax benefit of an exchange of the AOG Units have been determined. Next, an appropriate discount rate must be applied in order to determine the present value of the TRA's tax benefit.

Derivation of Required Rate of Return: The discount rate to be derived for the tax benefit of the TRA represents the required rate of return which an investor would demand at a point in time in order to invest in the TRA asset. This

discount rate reflects current rates of return seen in the public capital markets plus a number of company- and industry-specific factors.

The appropriate required rate of return for the TRA is based on Apollo's cost of equity, since the tax benefit is based on taxable income, i.e. after debt service.

The equity discount rate to be derived for an entity's cash flows represents the required rate of return that an investor would demand at a point in time in order to hold an ownership interest in its capital. This discount rate reflects current rates of return seen in the public capital markets plus a number of company- and industry-specific factors.

Additionally, market-based rates of return at the Valuation Date are summarized in the following table. Details regarding the selection of discount rates based on comparable guideline companies are presented in Exhibit H-1 and H-2.

Summary of Required Rates of Return

Source	Required Rate of Return
20-year U.S. Treasury Rate (risk-free rate) ³⁹	2.64%
Prime Rate ⁴⁰	3.25%
Large Cap Stocks ⁴¹	8.84%
Small Cap Stocks ⁴²	15.04%

The discount rate, or the rate of return that investors require, incorporates the following elements:

- A "risk-free rate," which generally is the rate available on instruments considered to have no default risk, such as U.S. Treasuries. The risk-free rate compensates the investor for renting out their money and for the expected loss of purchasing power (inflation) during the holding period.

³⁹ Federal Reserve Statistical Release H.15.

⁴⁰ Ibid.

⁴¹ *Stocks, Bonds, Bills and Inflation: 2015 Classic Yearbook*, Morningstar, Inc., 2015, Chicago, Illinois. For large capitalization stocks the calculation is a sum of the risk-free rate and the expected returns of 6.2% realized on large capitalization stocks over the risk-free rate (Table 11-7, page 158).

⁴² *Ibid.* Small capitalization stocks, which are riskier by virtue of their smaller revenue and income base and capitalization, have returned an additional 6.2% above the return witnessed for large capitalization stocks (Table 7-6, page 109 [mean return, micro-cap of 18.3%] less Table 6-7, page 91 [mean return, large-cap of 12.1%]).

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- A premium for risk, which incorporates the degree of uncertainty as to the realization of the expected return. The risk premium includes: (1) systematic risk related to the movements in returns on the investment market in general; and (2) unsystematic risk, which is risk specific to the subject investment.

This discount rate reflects current rates of return seen in the public capital markets, plus a number of company- and industry-specific factors.

Capital Asset Pricing Model (“CAPM”): The cost of equity estimate was developed with the CAPM. The CAPM is a model that is commonly used to obtain discount rates for valuation purposes. The basic logic of the CAPM model is that a company’s risk premium is determined by the sensitivity of its stock price, i.e. equity value, to the price changes of the market as measured by an appropriate broad-based index, e.g. S&P 500 (“systematic risk,” measured by *Beta*). This model has been one of the primary underpinnings of applied work in finance due to its simple, intuitive logic and ease of application.

The model used to develop our estimates of cost of equity is as follows:

$$K_e = R_f + R_p (\beta) + R_{sm}$$

Where:

K_e	=	Cost of Equity
R_f	=	Risk free rate of return
R_p	=	Market Risk Premium
R_{sm}	=	Small Company Risk Premium
β	=	Sensitivity of the security to changes in the market

The cost of equity, K_e was identified based upon publicly available information. Betas of a group of selected U.S.-traded guideline companies were obtained from the *Bloomberg Network*. The betas were first unlevered based upon the respective firms’ capital structures and an unlevered beta was selected for Apollo to use as a proxy for the three GP entities considered in this section. Then, the selected beta was relevered based upon the guideline companies’ debt-to-equity ratios and Apollo’s expected long-term debt-to-equity ratio. See Exhibit H-1.

The resulting cost of equity of 12.1% is based upon an unlevered beta factor of 1.3. The determination of the cost of equity using the CAPM is included in Exhibit H-2.

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Asset Specific Risk Adjustments: Again, the unadjusted equity rate of 12.1% selected above is without consideration of asset specific risk factors for the TRA. Therefore, in order to reflect asset-specific risks, an additional risk adjustment must be considered for application to the equity discount rate derived above. Risk factors relevant to the revenue stream are discussed below.

- The exact timing of the future tax benefits is based on achieving sufficient taxable income necessary to receive the tax benefit over the minimum period of 15 years.
- The taxable income sufficient to fully recognize the TRA tax benefit may be impacted by the exchange of other AOG Units with similar tax receivable agreements, as well as the existing tax benefit resulting from the restructuring of AOG and subsequent 144A sale in 2007.
- TRA payments are on par with unsecured debt, and are senior to dividend payments to AOG Class A shares.

Based on the risk factors cited above, a TRA specific discount rate of 12.0% was selected.

Conclusion of Fully Marketable Value of TRA: Applying the discount rate of 12.0% to the forecasted TRA tax benefit cash flows results in the present value of the incremental benefit at \$225.8 million. The calculated benefit related to the exchange of the AOG Units is shared 85% by the AOG Unit-holder and 15% by APO Corp (a wholly-owned subsidiary of Apollo.) Therefore, the fully marketable value attributable to the TRA associated with the AOG Units is \$191.9 million.

Put Option Analysis – TRA: The put option analysis described above with respect to the restriction period of the AOG Units was applied to determine the restriction period discount for the TRA. Below are the specific inputs utilized to derive the cost of hedging the TRA with a put option as of the Valuation Date. See also Exhibit G-4.

- **Current Stock Price and Exercise Price:** \$191.9 million per the analysis discussed above and presented in Exhibit G-4.
- **Volatility:** 30% was selected as the volatility input. This figure was determined after analyzing the historical and implied volatilities of the comparable guideline companies and reviewing the Company's volatility

assumptions as stated in its SEC filings. A sample set of guideline companies' volatility measures was gathered and is presented in Exhibit G-2.

- **Dividend yield:** 0% was used as this is a hypothetical situation. Since the option holder will get any dividends paid since they own the underlying shares, their position is not harmed by such payments.
- **Term:** The term used was based on the schedule provided by the Exchange Agreement. Based on the Shareholders Agreement, the Units can be exchanged after the expiration of a two-year lock-up following the successful pricing of the Company's IPO. The exchange is subject to a schedule that allows the Unit-holder to exchange 7.5% of the aggregate Units held in each of four successive years. The remaining 70% of the Units can be exchanged in the fifth year following the initial lock-up. Again, the first, second, and third tranches were exchangeable as of the Valuation Date, but were subject to SEC Rule 144. The weighted average time to exchange and dribble-out the entire block (considering SEC Rule 144 for the dribble out) is 1.6 years.⁴³ This is the period which the hypothetical buyer would have to wait before effectively beginning to realize the benefit of the TRA payments.
- **Risk-free Rate:** The Valuation Date yield of 0.53%, on a continuously compounded basis, based on the average of the 1-year and 2-year U.S. Treasury notes.

The theoretical cost of a put option for the Units calculated to be 14.8% of the fully marketable value of the TRA. See Exhibit G-4. The TRA was not publicly traded (like the Class A shares).

Therefore, based on the implied lack of marketability discount from the put option analysis, Empire selected 15% for the lack of marketability discount applicable to the fully marketable value of the TRA. Applying a 15% lack of marketability discount to the fully marketable value of \$191.9 million for the TRA results in a fair market value estimate of \$163.0 million, rounded, for the TRA associated with the AOG Units. See Exhibit G-3.

⁴³ $1.6 \text{ years} = [(20,863,612 \text{ units} \times 0.33 \text{ years}) + (6,954,537 \text{ units} \times 0.82 \text{ years}) + (64,909,016 \text{ units} \times 2.08 \text{ years})] / (20,863,612 \text{ units} + 6,954,537 \text{ units} + 64,909,016 \text{ units})$.

C. 2007 Transaction TRA Benefit

Management provided projections for existing TRA dividend payment liability.⁴⁴ The aggregate projected TRA dividend payments and pro rata 41.68%⁴⁵ share attributable to BFP are presented in Exhibit G-5. Next, an appropriate discount rate must be applied in order to determine the present value of the TRA dividends.

As estimated above, Apollo's cost of equity was 12.1%. Pursuant to the TRA, dividend payments made pursuant to the agreement are always subordinate to any debt payments Apollo may have at the Valuation Date or in the future. This argues for a rate of return of at least a high-yield corporate bond.⁴⁶ At the same time, the dividend payments were considered less risky than Apollo's cost of equity since the TRA dividend did have a contractual claim on the Company's cash flows prior to any shareholder distributions. As such a reasonable range to consider for the discount rate applicable to the existing TRA benefit was between 7.2% and 12.1%. The projected existing TRA dividend payments were considered more like debt than equity. Therefore, Empire selected 10% as the required rate of return to apply to the projected existing TRA dividend payments.

Concluded Value of the Existing TRA Dividends: A 10% discount rate was applied to BFP's projected pro rata share of existing TRA dividends. The present value of BFP's aggregate TRA dividend was \$83.0 million, rounded. See Exhibit G-5.

Valuation of Black Family Partners, LP

A. BFP's Adjusted Book Value

As discussed above, a willing buyer would typically assess the value of BFP's capital on the basis of its underlying assets. Thus, it is reasonable to utilize AAM as a valuation method.

Book value, unadjusted, is another name for the shareholders' equity account as it appears on the balance sheet. Again, ABV as a willing buyer would assess it

⁴⁴ The term 'existing' is used to distinguish it from the potential TRA tax benefit associated with the 92.7 million AOG units discussed in the previous sections of this report. Whereas the existing TRA tax benefit amount, and to a large extent timing, are known, it is not the case for the potential TRA tax benefit associated with the possible future sale of AOG units.

⁴⁵ The pro rata share of 41.68% is based on the historical sharing ratio attributable to BFP at the July 2007 transaction that triggered the TRA benefit.

⁴⁶ BB rated corporate bonds had an average yield of 7.2% at the Valuation Date.

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involves determining the value of a company's bundle of assets, less its liabilities, but before transaction costs.

This analysis began by using the Partnership's Valuation Date balance sheet. In doing so, each asset and liability was assessed to determine its estimated market value as of the Valuation Date. A summary of the Partnership's assets and liabilities adjusted to reflect their market values as of the Valuation Date is summarized below. In general the adjustments made to stated capital account balances reflect the restrictions imposed upon BFP and its inherent inability to realize the stated capital account balance value of its assets. Detailed analyses regarding the adjustments were discussed above.

- **Cash and Money Market:** The Partnership had a checking account and money market funds with \$21.0 million and a money market fund with \$9,433. No adjustments were made to the cash account balances.
- **AINV Stock:** The Partnership held 603,632 shares of AINV stock. The stock closed at \$6.45 per share on the Valuation Date, with a mean value of \$6.46 per share. Therefore, the block of stock had a value of \$3.9 million (based on the mean per share value) at the Valuation Date.
- **ESWW Stock:** The Partnership held 14,389 shares of ESWW stock. The stock closed at \$52.75 per share on the Valuation Date, with a mean value of \$52.75 per share. The per share price was reduced by 10% for illiquidity, as discussed above. Therefore, the block of stock had an adjusted value of \$683,118 (based on the mean per share value) at the Valuation Date.
- **AAA Stock:** The Partnership held 28,730 shares of AAA stock. The stock closed at \$36.49 per share on the Valuation Date, with a mean value of \$36.59 per share. Therefore, the block of stock had a value of \$1.1 million (based on the mean per share value) at the Valuation Date.
- **LRN Stock:** The Partnership held 66,704 shares of LRN stock. The stock closed at \$12.79 per share on the Valuation Date, with a mean value of \$12.77 per share. Therefore, the block of stock had a value of \$851,810 (based on the mean per share value) at the Valuation Date.
- **PE/Fixed-Term Entity Direct Interests:** The PE interests were direct investments in various Apollo private equity funds and non-Apollo private equity funds. The capital account balances were adjusted, as summarized in

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detail previously in this report. The following table presents the capital account balance and adjusted book value of each interest.

PE/Fixed-Term Fund Interests

Entity	Capital Account Balance	Adjusted Book Value, rounded
ACIV	\$391,900	\$290,000
ACV	\$2,213,581	\$1,660,000
ACVI	\$19,774,934	\$16,810,000
ACC III	\$8,207,932	\$5,340,000
HAO	\$4,251,787	\$3,400,000
WCP	\$1,629,472	\$1,060,000
TEN4	\$1,010,023	\$660,000

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- **Capital Market/Hedge Funds:** The Partnership had investments in five Apollo related funds and five unrelated funds. The following table presents the capital account balance and adjusted book value of each interest.

Capital Market Fund Interests

Entity	Capital Account Balance	Adjusted Book Value, rounded
ASC	\$2,778,750	\$2,630,000
FCI II	\$14,883,721	\$10,420,000
AHL	\$52,000,000	\$36,400,000
APTP	\$25,579	\$18,000
APSHL	\$0	\$0
ACP	\$18,586,721	\$17,660,000
CVRF	\$19,626,613	\$18,840,000
KSC	\$1,095,198	\$770,000
LC	\$26,973,043	\$25,620,000
MG	\$28,867,183	\$27,710,000

- **Apollo Operating Group Ownership:** The Partnership, through BRH and Holdings, holds a block of AOG Units. AOG Unit ownership has significant restrictions regarding when the Partnership is able to sell the respective units. These details were discussed previously. Additionally, the AOG Units have the TRA which provided an economic benefit to the Partnership via its indirect ownership of the AOG Units not captured by Apollo's stock price.

Apollo Operating Group Interests

Entity	Capital Account Balance	Adjusted Book Value
AOG Units (w/o TRA)	\$1,761,816,154	\$1,500,000,000
TRA Benefit (future)	\$0	\$163,000,000
TRA Benefit (existing)	\$0	\$83,000,000

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- **Miscellaneous Interests:** A summary of the Partnership's other assets is presented in the following table.

Miscellaneous Interests

Entity	Capital Account Balance	Adjusted Book Value
Truckast LLC	\$0	\$0
Knowledge Universe Education LP	\$10,536,490	\$8,429,192
KU Management, Inc.	\$14,485	\$11,588
Curation Media	\$1,300,000	\$845,000
ESWW Convertible Notes	\$3,069,883	\$2,280,825
Rally Labs, LLC	\$181,277	\$117,830
Artbinder Inc.	\$9,998	\$6,499

- **Promissory Notes and Receivables:** No adjustments were made to BFP's related party note balances or receivables.
- **Liabilities:** The Partnership had no liabilities at the Valuation Date.

Based on the estimated market value of BFP's assets and liabilities, the Partnership's ABV can be stated at \$2,004,118,338, or \$20,041,183 for a pro rata 1% limited partnership interest. See Exhibit D.

B. Discount for Lack of Control and Marketability

The appraisal of any business is as much an art as a science. One reason that the value of a closely-held business is never completely objective is that much of this value lies in less quantifiable factors, such as marketability and control. The value that was derived above using the asset accumulation method is a fully controlling, fully marketable value. However, a minority shareholder of BFP has neither a control position nor a ready market for his or her interest.

The following discussion will address the factors which are considered relevant when determining appropriate discounts for control and lack of marketability. It should be noted that the criteria used to determine each discount individually can overlap. As such, although the following discussion addresses each discount separately, a combined discount for lack of control and marketability was applied to the freely tradable value of BFP's equity to determine its fair market value.

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1. Discount for Lack of Control

When valuing a company, a valuation methodology which utilizes required rates of return from the public market is generally assumed to be a minority interest value. However, when consideration is given for a controlling interest position, as is the case when using the asset accumulation method, the controlling interest holder has the ability to exercise the prerogatives of control (e.g., the ability to set dividends and salaries, and make daily business decisions). The value of this control is usually recognized by a premium over the non-controlling interest valuation, as is demonstrated by the transaction data cited below. Since a non-controlling interest position is being valued, some discount for lack of control, or the inverse of the stated premiums, must be considered.

The application of a discount for lack of control is particularly warranted in appraising limited partnership and non-managing membership interests in investment holding companies. Even without overt restrictions, a holding company interposes itself between an owner and the investment assets, thus creating administrative costs that would otherwise not be present. If an investor can purchase the same investment assets directly, without a discount there is no incentive for that investor to buy an interest in a holding company at its pro rata capital account value. The owners of non-controlling interests lack the ability to control operations, make or determine the level of distributions, or force dissolution.

In order to benchmark an appropriate discount for lack of control to use in valuing a non-managing membership interest, several benchmarks were considered. These included: (i) generic evidence of lack of control; and (ii) a sample of CEIC's invested in U.S. Government and Agency bonds.

Mergerstat Data: Publicly traded stocks are by definition freely tradable interests. Thus, when a bidder seeks control of a public company, a premium over its stocks' market pricing is usually paid. This is because certain prerogatives, or levels of control, are transferred with percentages of ownership above 50%, such as the authority to:

- Determine management compensation and perquisites;
- Declare and pay dividends;
- Sell or acquire assets and/or liabilities;
- Change the articles of incorporation or by-laws; and
- Liquidate, dissolve, sell, or recapitalize the company.

Alan Halperin, Esq.

November 3, 2015

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In determining an enterprise value, then, the incremental value of control is usually recognized by a premium over the non-controlling interest valuation, as is demonstrated by the transactions cited below. Conversely, the use of an asset-based valuation method is implicitly assumed to generate a 100% controlling interest, or enterprise, value. Since a non-controlling interest is under analysis, however, the inverse of these stated premiums⁴⁷ should be considered representative of the diminution of value due to lack of control.

A publication by FactSet Mergerstat LLC (“Mergerstat”), entitled *Mergerstat® Review 2015* was surveyed for comparatively generic evidence of the discounts appropriate for lack of control in companies. Mergerstat tracks merger and acquisition activity for public companies. For all industries over the five years 2010 to 2014: (i) the mean control premiums paid over a stock’s market pricing varied from 42.1% to 54.1%; (ii) the median premiums varied from 28.7% to 37.8%; and (iii) the five-year transaction-weighted average of the median premium was 33.7%. This latter premium corresponds to a discount for lack of control of 25.2% ($1 - [1 \div (1 + 33.7\%)]$).

Additionally, information from Mergerstat’s® *Second Quarter 2015 Control Premium Study* (the “Premium Study”) was considered. It reported that, between July 1, 2014 and June 31, 2015, there were 542 transactions across all industries in which control was acquired, with a median premium of 28.2% and a mean premium of 44.1%. These premiums mathematically correspond to respective lack of control discounts of 22.0% and 30.6%.

Closed-End Investment Company Benchmark: Discounts to NAV, or ICDs, associated with publicly traded closed-end funds or limited partnerships provide estimates that can serve as a base to determine a reasonable proxy for a lack of control discount. Generally, ICDs tend to be lower for funds with diversified portfolios of low risk assets (i.e., U.S. government and agency securities). ICDs tend to increase as the portfolios become more risky (equities and private investments) or less diversified (either concentrated in one industry or with a concentration in a specific security).

A sample of four CEICs invested primarily in government bonds and securities is presented in Exhibit I-3. ICDs associated with this sample ranged between 3.0% and 10.9%, with mean and median implied discounts of 5.9% and 5.0% respectively. The sample’s median yield was 3.9%.

⁴⁷ Implied discount for lack of control equals $1 - (1 \div [1 + \text{control premium}])$.

2. Discount for Lack of Marketability

a. Background

Since there is no public market in which the Interest can be sold, we applied a discount for lack of marketability (“DLOM”) to account for its illiquid nature. In selecting an appropriate DLOM, we performed both a qualitative and quantitative analysis. The qualitative analysis involved an assessment of key factors impacting marketability, as well as relevant restricted stock studies. The quantitative assessment involved analyzing restricted stock data based on key financial measures that influence the degree of marketability for the interest in question.

b. Restricted Stock Studies – Qualitative Assessment

As part of the qualitative analysis, we reviewed restricted stock studies covering transactions between 1966 and 2013. These studies are summarized in Addendum 4 of this report. The studies, which cover several hundred transactions over the specified time period, concluded that mean or median lack of marketability discounts typically range between 25% and 35%.

It is important to note that all shares of restricted stock observed in these studies would be tradable (subject to blockage issues) on an established public exchange following the expiration of a defined restriction period.⁴⁸ As the required holding period decreased from two years to one year, observed restricted stock discounts declined. This is consistent with financial theory that the required discount should decline as holding period restrictions are relaxed.

However, changes in the securities laws which have resulted in shorter required holding periods do not make the older restricted stock studies obsolete. In contrast to restricted stock, which can trade on an exchange once the restricted period has lapsed, shares of most privately-held companies will never have access to such a market because the characteristics of those businesses do not make them candidates for public stock offerings. As a result, the observed discounts in the pre-1990 restricted stock studies (i.e., when the restrictions were most stringent) provide a useful comparison along with the more current studies.

⁴⁸ Due to changes in securities law over time, the initial restriction period declined from two years to one year in 1997. Prior to that, the adoption of Rule 144A in 1990 provided partially improved liquidity, but did not modify the two-year holding period requirement. The initial required restriction period was reduced to one year effective April 1997 and further shortened, to six months, effective February 2008.

c. Estimated Lack of Marketability Discount - Qualitative Analysis

The impact of the qualitative factors on marketability is determined after reviewing many factors including, but not limited to, the factors discussed below.

- **Level of Distributions:** A company with a history of paying consistent distributions is generally considered more marketable than one that does not have such a history.

BFP was invested in fixed-term funds, evergreen funds and development stage companies, assets seeking capital appreciation. BFP's interest in BRH (comprised of the AOG Units owned through Holdings and TRA dividend payments) provided a potential source of capital appreciation and a source of cash dividends. While BFP receives cash dividends from its investments, the proceeds have historically been used to fund new investments or commitments to existing investments and not distributed to BFP's partners. However, the Partnership has recently begun to make distributions of unreserved cash. Distribution amounts and timing are at the discretion of the general partner. Accordingly, there is no formal policy in place for distributions, and a limited partner cannot assume or expect distributions at any given time (or at all). If made, any distributions must be pro rata among all members. This situation tends to enhance the marketability of the subject interest.

- **Information Access & Reliability:** A purchaser of a non-controlling interest has to accept the information provided, and that information can often be curtailed by the general partners or managers. Concern about this issue is mitigated somewhat when management has a history of providing the minority owners with audited financial statements and/or access to the company's books and records.

The Partnership does not prepare audited financial statements or file its own tax return. This situation tends to reduce the marketability of the subject interest.

- **Transfer and Withdrawal Restrictions:** The ability of an investor to transfer or liquidate his interest, along with the time required to do so, is a major factor in assessing the appropriate DLOM.

BFP permits transfers without the prior written consent of the general partner. However, the consent of the general partner is required for such transferee to be admitted as a partner of BFP. Although BFP does provide

for the withdrawal of capital, all such withdrawals would be made in-kind at the discretion of the general partner. To be clear, a partner requesting a withdrawal of capital would receive assets upon withdrawal, and the assets distributed would be selected at the discretion of the general partner. Since at the Valuation Date BFP had significant unfunded capital commitments in the fixed-term funds, there would be no incentive for the general partner to distribute cash in the event that a withdrawal was requested; all available cash was required to meet capital commitments. Therefore, distributed assets were expected to be illiquid. There was no way to exit or redeem capital for the underlying investments representing approximately 90% of BFP's adjusted asset value. This situation was significantly less attractive than one in which a withdrawing partner was required to receive cash or marketable securities upon a withdrawal. This combination of factors tends to reduce the marketability of the Interest. However, the reduction in marketability of the Interest was mitigated by the ability to at least withdraw assets.

- **Expected Holding Period:** The length of the expected holding period of the interest impacts marketability; the longer the expected holding period, the less marketable an asset will be. For example, the presence of a near-term exit event, such as dissolution, an IPO, or a sale/merger, generally improves marketability. While the existence of legal restrictions may adversely impact an owner's ability to sell, the absence of such restrictions does not necessarily improve marketability if there is no active public market in which an asset can be sold. Separately, to the extent that the owner of an equity interest in a subject company has a contractual or legal right to "put" the stock back to the company or the other owners, the marketability of an interest is typically improved.

Probability of an Exit Event: BFP does not have a specific term and the Partnership is not considering liquidation. This situation tends to reduce the marketability of the Interest.

Existence of Put Rights: BFP's partners do not specifically possess put rights. This situation tends to reduce the marketability of the Interest.

- **Historical Trading Activity:** To the extent that arms' length transaction activity exists involving shares of the subject company's stock, marketability may be improved.

Empire is not aware of any historical trading activity involving limited partnership interests in BFP. This situation tends to reduce the marketability of the subject interest.

d. Restricted Stock Study Data – Quantitative Assessment

In 2013, FMV Opinions updated *The FMV Restricted Stock Study*^{TM49} (referred to here as the “2013 Discount Study”), which contains 779 restricted stock transactions occurring from 1980 to 2013, and provides data on approximately 50 variables for each transaction. The market reference price used to calculate the discount is the average of the highest and lowest share price for the month of the transaction. The overall average discount in the 2013 Discount Study data is 18.6%, while the median discount is 14.6%.⁵⁰ Several conclusions reached by the 2013 Discount Study are listed in Addendum 4.

The underlying data from the 2013 Discount Study can be used to estimate a DLOM for closely-held companies. The 2013 Discount Study recommends using a two-step process in which: (1) a quantitative analysis of the company-specific risk factors results in an “as if” publicly traded Restricted Stock Equivalent Discount;⁵¹ and (2) a second quantitative analysis is used to estimate an incremental discount above the Restricted Stock Equivalent Discount to recognize the similar illiquidity characteristics between privately-held companies and large blocks of restricted stock to estimate a Private Company Discount Increment. We followed this process for the quantitative part in estimating the lack of marketability discount.

e. Summary Findings from the 2013 Discount Study Data

Please see Addendum 4 for a description of how we analyzed the data, and the conclusions drawn, from the 2013 Discount Study. Some of the more significant findings from this analysis are highlighted below.

⁴⁹ *Determining Discounts for Lack of Marketability: A Companion Guide to the FMV Restricted Stock Study*.TM FMV Opinions, Inc., 2013 (data used within study current through March 2013).

⁵⁰ The reported overall discounts are based on the full data set of 779 transactions.

⁵¹ For this step, we limited the sample to transactions involving block sizes of 20% or less of a firm’s outstanding stock following the restricted stock transaction. Due to the relatively long periods generally required to liquidate larger blocks of restricted stock following the expiration of the initial restriction period, larger blocks of restricted stock in the 2013 Discount Study tend to have illiquidity characteristics more similar to stock in privately-held companies (in blocks of any size), for which no market exists. Therefore, an adjustment based on the differential discounts between small and large blocks of restricted stock is appropriate to estimate a DLOM.

Analysis of Size Metrics: As shown in Exhibit J-1, implied restricted stock discounts are inversely related to a company's size, measured as revenue, market value, book value or total assets.

Analysis of Risk Metrics: Discounts are positively correlated with volatility, given that a greater lack of marketability discount would be demanded by an investor for taking on greater risk. See Exhibit J-2.

Analysis of Profitability Metrics: Discounts are inversely related to net profit margins. See Exhibit J-2.

Dividend Payments: As shown in Exhibit J-2, discounts for dividend paying firms are less than for those not paying dividends.

f. Quantitative Analysis Based on 2013 Discount Study

Restricted Stock Equivalent Discount: The previously identified variables were considered in calculating the Restricted Stock Equivalent Discount. Each of the inputs was analyzed to identify the relevant quintile for each metric. The median observed restricted stock discount from the appropriate quintile was then selected for that measure. This is described in greater detail below.

- **Historical Financial Metrics:** These metrics were based on the subject entity's most recent annual financial results.

Regarding net profit margin and dividends, the analysis was based on whether or not the subject company was: (1) profitable or not profitable; and (2) dividend paying or non-dividend paying.⁵² BFP was both profitable and distributing on a regular basis during the period reviewed.

- **Market Value of Equity:** This is equivalent to the aggregate marketable minority interest value of the subject entity's equity derived in Empire's analysis.
- **Volatility:** Empire reviewed the volatility measures for Apollo and comparable companies since the AOG Units through BRH and Holdings were the largest holding of the Partnership. See Exhibit G-2. Based on these

⁵² In the event that the subject company is a pass-through entity, the company would be considered to be "dividend-paying" if it paid dividends or distributions in excess of those required for the payment of related income taxes.

observations we selected 30% as a reasonable estimate for the Partnership's expected volatility.

Exhibit J-3 summarizes the calculation of the Restricted Stock Equivalent Discount. In deriving this discount, the results of the analysis of each metric were weighted as follows: (1) 33.33% to market value of equity;⁵³ (2) 33.33% to volatility; and (3) 33.33% to dividend policy.

As a result of this analysis, a reasonable Restricted Stock Equivalent Discount for BFP was estimated at 13.0%. Again, see Exhibits J-1 through J-3.

Private Company Discount Increment.⁵⁴ A Private Company Discount Increment was selected based primarily on an analysis of the differential discounts between large and small block transactions and also considers the qualitative factors impacting marketability.

As shown in Exhibit J-4, a range of Private Company Discount Increments of 1.27 times to 2.12 times the Restricted Stock Equivalent Discount was calculated. This calculation is based on a comparison of: (1) the median Restricted Stock Equivalent Discount of 20% for all 345 transactions involving less than 20% of the post-transaction shares outstanding; and (2) the minimum and maximum observed median discounts for block sizes in excess of 20% shown in Exhibit J-4.

Applying the range of Private Equity Discount Increments to the selected Restricted Stock Equivalent Discount of 13.0% for BFP indicates that a reasonable DLOM would range from 17% to 27%, rounded, with a mid-point of 22%.

C. Conclusion

Empire selected a combined discount for incremental lack of control and marketability based on the foregoing review and analysis, including but not limited to: (i) a member's ability to withdraw from the Partnership, per the Agreement provisions described above; (ii) restriction period discounts applied to the Partnership's assets; and (iii) the market based evidence for discounts of lack of control and lack of marketability, a combined discount for lack of control and marketability of 15% was considered appropriate. Applying a 15% discount to the fully marketable value of \$20,041,183 results in a fair market value of

⁵³ The Partnership's revenue and book value metrics were based on internally prepared financial statements and were not considered indicative of BFP's actual size from a financial perspective.

⁵⁴ See Addendum 4 for further detail regarding the Private Company Discount Increment.

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\$17,000,000, rounded, for a 1% non-managing membership interest as of the Valuation Date. [\$20,041,183 x (1 – 15%).] See Exhibit D.

Valuation Summary

Given the foregoing review and analysis, and subject to the attached Statement of Limiting Conditions, it is our estimate that the fair market value of a 1% limited partnership interest in Black Family Partners, LP is reasonably stated as \$17,000,000 as of September 3, 2015. It is our understanding that this report will be used by you and Mr. Leon Black for estate planning purposes related to GRAT annuity payments.

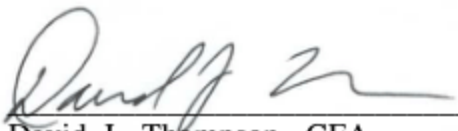
This appraisal is not intended for any other purpose nor for any other users and the sharing of the contents herein is not permitted without the express written consent of Empire Valuation Consultants, LLC. Empire has no obligation to update this appraisal for information that comes to our attention after the date of this report.

Respectfully submitted,

Empire Valuation Consultants, LLC



Jeffrey T. Schultz
Senior Valuation Associate



David J. Thompson, CFA
Manager



Scott A. Nammacher, ASA, CFA
Managing Director

STATEMENT OF LIMITING CONDITIONS

1. Financial statements and other related information provided by or on behalf of the client entity or its representatives, in the course of this engagement, have been accepted without any verification as fully and correctly reflecting the enterprise's business conditions and operating results for the respective periods, except as specifically noted herein. Empire Valuation Consultants, LLC has not audited, reviewed, or compiled the financial information provided to us and, accordingly, we express no audit opinion or any other form of assurance on this information.

2. Public information and industry and statistical information have been obtained from sources we believe to be reliable. However, we make no representation as to the accuracy or completeness of such information and have performed no procedures to corroborate the information. Information used was limited to that available on or before the Valuation Date, or which could be reasonably ascertained as of that date. We reserve the right to make such adjustments to the valuation herein reported as may be required by consideration of additional or more reliable data that may become available subsequent to the issuance of this report.

3. We do not provide assurance on the achievability of the results forecasted by the client entity because events and circumstances frequently do not occur as expected; differences between actual and expected results may be material; and achievement of the forecasted results is dependent on actions, plans, and assumptions of management.

4. The conclusion of value arrived at herein is based on the assumption that the current level of management expertise and effectiveness would continue to be maintained, and that the character and integrity of the enterprise through any sale, reorganization, exchange, or diminution of the owners' participation would not be materially or significantly changed.

5. This report and the conclusion of value arrived at herein are for the exclusive use of our client for the sole and specific purposes as noted herein. They may not be used for any other purpose or by any other party for any purpose. Furthermore the report and conclusion of value are not intended by Empire Valuation Consultants, LLC and should not be construed by the reader to be investment advice in any manner whatsoever. The conclusion of value represents the considered opinion of Empire Valuation Consultants, LLC, based on information furnished to them by the client entity and other sources.

6. Neither all nor any part of the contents of this report (especially the conclusion of value, the identity of any valuation specialist(s), or the firm with which such valuation specialists are connected or any reference to any of their professional designations) should be disseminated to the public through advertising

media, public relations, news media, sales media, mail, direct transmittal, or any other means of communication without the prior written consent and approval of Empire Valuation Consultants, LLC.

7. Future services regarding the subject matter of this report, including, but not limited to testimony or attendance in court, shall not be required of Empire Valuation Consultants, LLC unless previous arrangements have been made in writing.

8. Empire Valuation Consultants, LLC is not an environmental consultant or auditor, and it takes no responsibility for any actual or potential environmental liabilities. Any person entitled to rely on this report, wishing to know whether such liabilities exist, or the scope and their effect on the value of the property, is encouraged to obtain a professional environmental assessment. Empire Valuation Consultants, LLC does not conduct or provide environmental assessments and has not performed one for the subject property.

9. Empire Valuation Consultants, LLC has not determined independently whether the client entity is subject to any present or future liability relating to environmental matters (including, but not limited to CERCLA/Superfund liability) nor the scope of any such liabilities. Empire Valuation Consultants, LLC's valuation takes no such liabilities into account, except as they have been reported to Empire Valuation Consultants, LLC by the client entity or by an environmental consultant working for the client entity, and then only to the extent that the liability was reported to us in an actual or estimated dollar amount. Such matters, if any, are noted in the report. To the extent such information has been reported to us, Empire Valuation Consultants, LLC has relied on it without verification and offers no warranty or representation as to its accuracy or completeness.

10. Empire Valuation Consultants, LLC has not made a specific compliance survey or analysis of the subject property to determine whether it is subject to, or in compliance with, the Americans with Disabilities Act of 1990, and this valuation does not consider the effect, if any, of noncompliance.

11. No change of any item in this appraisal report shall be made by anyone other than Empire Valuation Consultants, LLC, and we shall have no responsibility for any such unauthorized change.

12. Unless otherwise stated, no effort has been made to determine the possible effect, if any, on the subject business due to future Federal, state, or local legislation, including any environmental or ecological matters or interpretations thereof.

13. If prospective financial information approved by management has been used in our work, we have not examined or compiled the prospective financial information and therefore, do not express an audit opinion or any other form of assurance on the prospective financial information or the related assumptions. Events and

circumstances frequently do not occur as expected and there will usually be differences between prospective financial information and actual results, and those differences may be material.

14. We have conducted interviews with the current management of the client entity concerning the past, present, and prospective operating results of the company, as applicable for this analysis.

15. Except as noted, we have relied on the representations of the owners, management, and other third parties concerning the value and useful condition of all equipment, real estate, investments used in the business, and any other assets or liabilities, except as specifically stated to the contrary in this report. We have not attempted to confirm whether or not all assets of the business are free and clear of liens and encumbrances or that the client entity has good title to all assets.

16. The fee established for the formulation and reporting of these conclusions is not contingent upon the value or other opinions presented.

17. Neither the appraiser nor any officer or employee of Empire Valuation Consultants, LLC has any interest in the property appraised.

18. We assume that there are no hidden or unexpected conditions of the assets valued that would adversely affect value.

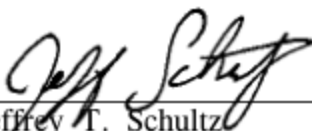
19. No opinion is intended for matters which require legal or specialized expertise, investigation or knowledge, beyond that customarily employed by appraisers.

CERTIFICATION OF APPRAISERS

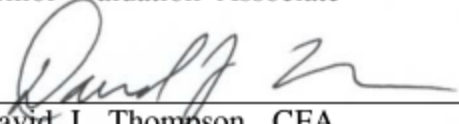
We the appraisers certify that, to the best of our knowledge and belief:

1. Our analyses, opinions and conclusions were developed, and this report was prepared, in conformity with the Uniform Standards of Professional Appraisal Practice.
2. All statements of fact contained in this report are true and correct.
3. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are our personal, unbiased professional analyses, opinions, and conclusions.
4. Neither Empire nor any of its employees has, to the best of our knowledge, either a present or intended financial interest in the entity that is the subject of this report, in any affiliates that may exist, or with respect to the parties involved.
5. Empire has performed services as an appraiser regarding the property that is the subject of this report on a quarterly basis since August 2013.
6. We have no bias with respect to the entity that is the subject of this report or to the parties involved with this assignment.
7. Empire's engagement in this assignment was not contingent upon developing or reporting predetermined results.
8. The professional fee paid to Empire for the preparation of this report is not contingent upon its conclusion, including: developing or reporting a predetermined value or direction of value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
9. No one provided significant business appraisal assistance to the persons signing this certification, unless specifically stated herein.

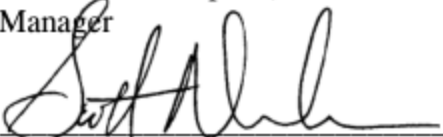
The American Society of Appraisers has a mandatory recertification program for all of its Accredited Senior Appraisers. The senior members signing below, designated by the "ASA," are in compliance with that program.



Jeffrey T. Schultz
Senior Valuation Associate



David J. Thompson, CFA
Manager



Scott A. Nammacher, ASA, CFA
Managing Director

November 3, 2015

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Valuation Services

Empire Valuation Consultants, LLC provides valuations to private equity and hedge funds, business owners, attorneys, accountants, commercial bankers, investment bankers, trust departments, insurance agents, and financial planners, among others. **Empire's** consultants have prepared or managed the preparation of over 20,000 appraisals for the following reasons:

- Private Equity & Hedge Fund Marking
- Transfer Pricing
- Solvency Opinions
- Buy/Sell Agreements
- Gifting Programs
- Estate Taxes
- Mergers & Acquisitions
- Blocks of Publicly Traded Securities
- Employee Stock Ownership Plans (ESOPs)
- Financial and SEC Reporting
- Fairness Opinions
- Litigation Support
- Redemptions
- Recapitalizations
- Going Private Transactions
- Stock Option Plans
- Dissenting Shareholder Suits
- Impairment Testing
- Intellectual Property
- Purchase Price Allocations

Other Financial Services

Litigation Support & Expert Testimony

Empire can assist you with research and litigation support and its professionals are available to provide expert testimony in matters involving questions of valuation.

ESOP Feasibility Studies & Preliminary Valuations

Empire is available to work with our client's team of financial advisors or participate in independent feasibility studies and preliminary valuation reviews in connection with ESOP formation planning.

JEFFREY T. SCHULTZ

Academic Degrees

- . University of Rochester, William E. Simon Graduate School of Business Administration, Finance, 2004
- B.S. Rochester Institute of Technology, College of Business, Manufacturing and Materials Management, 1996

Employment

Empire Valuation Consultants, Rochester, New York
Senior Valuation Associate, 2006 – Present.

Ontario and Trumansburg Telephone Cos., Phelps, NY
Customer Service and Sales Manager, 2004 – 2006.

Rochester Gas and Electric Corp., Rochester, NY
Subprocess Owner, 1980 – 2003.

Experience

Mr. Schultz joined Empire Valuation Consultants in 2006, bringing with him strong quantitative and financial analysis experience, as well as significant operational, managerial and consulting skills.

While at Rochester Gas and Electric, he was responsible for creating and providing testimony for gas and electric rate cases. Mr. Schultz' work also involved developing detailed analysis that highlighted the costs, projected savings, and net present value for numerous technology deployments.

Mr. Schultz is a former Board Member of the Wayne Central School District Board of Education. During his tenure, he acted as the Board's President, Vice President, and Chairperson for the District's Audit Committee.

DAVID J. THOMPSON, CFA

Academic Degrees

- ██████. University of New South Wales & University of Sydney, Australian Graduate School of Management, Finance, Dean Scholarship winner, 2005
- ██████. University at Buffalo, Secondary Mathematics Education, 1997
- B.A. University at Buffalo, Mathematics, with distinction, magna cum laude 1994

Employment

- Empire Valuation Consultants, Rochester, New York
 - Manager, 2011 - Present
 - Senior Valuation Associate, 2008 - 2011
 - Valuation Associate, 2006 - 2008
- Idea Connections Consulting, Inc., Rochester, New York
 - Vice President of Operations, 2002 - 2003 and 2005 - 2006
- IKON Office Solutions, Buffalo New York
 - Senior Application Developer, 1998 - 2002

Experience

David is a Chartered Financial Analyst. Since joining Empire, David has been involved in hundreds of business valuations covering a diverse array of industries. He has been involved in the valuation of various classes of equity and debt, family limited partnerships, limited liability companies, intangible assets, purchase price allocations and stock options. These valuations have been for estate and gift tax reporting, employee stock ownership plan administration, acquisitions, recapitalizations, matrimonial litigation, general corporate reporting, and SEC reporting. He has extensive experience with the valuation hedge fund and private equity fund management companies and general partners.

Prior to joining Empire, David worked as Vice President of Operations at Idea Connections where he was responsible for financial analysis and projections, effective cost control, project management and assisted in the negotiations for the separation of the group from its parent company. While with IKON he developed workflow and document management applications for private companies and government agencies.

SCOTT A. NAMMACHER, ASA, CFA

Academic Degrees

- ██████. New York University Graduate School of Business, Finance, 1985
B.S. University of Minnesota, Business, 1977

Employment

Principal and Managing Director, Empire Valuation Consultants, LLC, New York, New York, 1992-Present

Manager, Financial Valuations, Arthur Andersen & Co., New York, 1990-1991

██████., Marigold Capital Development, Investment Banking Div. of Marigold Enterprises, Greenwich, Connecticut, 1989-1990

Manager - Domestic Finance, PepsiCo, Inc. Purchase, New York, 1985-1989

Experience

Mr. Nammacher is an Accredited Senior Appraiser (ASA) of the American Society of Appraisers and is a Chartered Financial Analyst (CFA). He has over 20 years of experience in financial consulting and business valuations. He has valued the equity, debt, warrants, NOLs, etc. of publicly and privately held businesses for acquisitions, divestitures, stock repurchases, estate and gift tax reporting, buy/sell agreements, recapitalizations, and general corporate planning purposes. Mr. Nammacher has also developed business plans and financing packages, and has been involved in completed transactions totaling over \$1.5 billion. In addition, he played key roles in the successful launch of a new business publication.

Mr. Nammacher has testified as an expert witness in U.S. Tax Court, U.S. Bankruptcy Court, Delaware Chancery Court and other courts and arbitration settings around the country, and published a book and several articles on "junk bonds." He also received the prestigious "Graham & Dodd Scroll Award" from the *Financial Analysts Journal* for outstanding financial writing relating to a cover story he co-authored.

He served two terms as an elected member of the American Society of Appraisers' Business Valuation Committee, the oversight entity for the business valuation arm of the ASA. He has spoken on valuation issues around the country and has chaired an annual valuation conference in New York City for over 17 years. He co-chaired the first joint AICPA/ASA valuation conference ever presented.

LACK OF MARKETABILITY BENCHMARK STUDIES

Overview of Restricted Stock Studies¹

Study	Years Covered	# of Transactions	Mean Discount	Median Discount
Two-Year Holding Period (Pre-1990)				
SEC, Overall Average	1966-1969	398	25.8%	24.0%
SEC, Non-reporting OTC Companies	1966-1969	112	N/A	32.6%
Gelman	1968-1970	89	33.0%	33.0%
Trout	1968-1972	60	33.5%	N/A
Moroney	Unknown	146	35.5%	33.0%
Maher	1969-1973	33	35.4%	33.3%
Standard Research Consultants	1978-1982	28	N/A	45.0%
FMV Opinions, Inc. (2013) ²	1980-1989	58	23.2%	23.2%
Management Planning, Inc. (2011)	Pre-1990	79	30.5%	32.3%
Hertzel & Smith	1980-1987	106	20.1%	13.3%
Willamette Management Associates	1981-1984	33	N/A	31.2%
Silber	1981-1988	69	33.8%	35.0%
Two-Year Holding Period (Post-1990)				
FMV Opinions, Inc. (2013)	1990 – 3/31/97	141	23.5%	21.0%
Management Planning, Inc. (2011)	1990 – 4/30/97	110	25.1%	22.5%
Bruce Johnson	1991-1995	72	20.0%	N/A
Columbia Financial Advisors, Inc.	1996-1997	23	21.0%	14.0%
One-Year Holding Period				
Columbia Financial Advisors, Inc.	1997-1998	15	13.0%	9.0%
FMV Opinions, Inc. (2013)	4/1/97-11/15/07	169	25.3%	21.1%
Management Planning, Inc. (2011)	5/1997 – 2/2008	164	20.8%	16.6%
Trugman Valuation Associates, Inc.	1/1/07-11/15/07	46	17.9%	14.7%
Six Month Holding Period				
Trugman Valuation Associates, Inc.	11/16/07-12/31/08	34	18.4%	14.4%
Management Planning, Inc.(2011)	2/2008 – 2009	49	5.9%	5.0%
FMV Opinions, Inc. (2013)	11/16/07-2013	27	17.8%	14.4%
Stout Risius Ross, Inc.	9/2005 to 5/2010	98	10.9%	9.3%

¹ Citations are included with the subsequent description of each study.

² The results of the FMV Opinions, Inc. studies for all holding periods exclude transactions which took place at implied premiums, as well as those which included registration rights.

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The restricted stock studies are divided into three primary groups: (1) studies ending before May 1997, when the required holding period under SEC³ Rule 144 was two years; (2) studies ending after May 1997, when the required holding period was reduced to one year, and prior to November 15, 2007; (3) studies including transactions after November 15, 2007, when the SEC announced that the required holding period would be reduced to six months.⁴ The first group is subdivided into two categories, before 1990 and after 1990. In 1990, the SEC adopted Rule 144A, which relaxed the SEC filing restrictions on private transactions. The rule allows qualified institutional investors to trade unregistered securities among themselves without filing registration statements, which improved liquidity.

As noted above, the rule change which reduced the Rule 144 required holding period to six months was announced by the SEC on November 15, 2007, and would take effect 60 days after its publication in the *Federal Register*. The rule was published in the *Federal Register* on December 17, 2007,⁵ and took effect on February 15, 2008. Therefore, although the rule did not take effect until February 15, 2008, the pending rule change would have been a consideration to potential buyers after its announcement on November 15, 2007.

The studies are discussed further in the following sections of this document.

Institutional Investor Study:⁶ The SEC published study #77-287 in 1971, called the “Institutional Investor Study.” The Institutional Investor Study examined the amount of discount at which transactions in restricted stock, or letter stock, took place compared to the prices of identical but unrestricted stock on the open market from 1966 through 1969.

The study shows that the discounts on the letter stocks were the least for New York Stock Exchange (“NYSE”) listed stocks, but increased, in order, for American Stock Exchange (“ASE”) listed stocks, over-the-counter (“OTC”) reporting companies and OTC non-reporting companies. For OTC non-reporting companies, the largest number of restricted stock transactions fell in the 30% to 40% discount range. Slightly over 56% of the OTC non-reporting companies experienced discounts greater than 30% on the sale of their restricted stock. A little over 30% of the OTC reporting companies experienced discounts over 30%, and over 52% experienced discounts over 20%. The following table segments the data observed by the SEC according to the size of the discount.

³ Securities and Exchange Commission.

⁴ “SEC Votes to Adopt Three Rules to Improve Regulation of Smaller Businesses.” www.sec.gov/news/press/2007/2007-233.htm.

⁵ *Federal Register*, Vol. 72, No. 241., pg. 71551. December 17, 2007.

⁶ “Discounts Involved in Purchases of Common Stock (1966-1969),” *Institutional Investor Study Report of the Securities and Exchange Commission*, H.R. Doc. No. 64, Part 5, 92d Congress., 1st Session. 1971, pp. 2444-2456.

Institutional Investors Study Data

Discount (Premium)	Number of Transactions	Percent of Study Total
-15.0% to 0.0%	26	6.5%
0.1% to 10.0%	67	16.8%
10.1% to 20.0%	78	19.6%
20.1% to 30.0%	77	19.3%
30.1% to 40.0%	67	16.8%
40.1% to 50.0%	35	8.8%
50.1% to 80.0%	48	12.1%
-15.0% to 80.0% (total)	398	100.0%

The magnitude of the discount for restricted securities from the trading price of the unrestricted securities was generally related to the factors listed below.

- **Earnings:** Earnings played the most significant role in determining the discounts at which these stocks were sold from the current market price. The degree of risk of an investment is determined more by earnings patterns, rather than sales patterns.
- **Sales:** Companies with the largest sales volumes received the smallest discounts and the companies with the smallest sales volumes received the largest discounts.
- **Trading Market:** Discounts were greatest on restricted stocks with unrestricted counterparts traded over-the-counter, followed by those with unrestricted counterparts listed on the ASE, while the discounts for those stocks with unrestricted counterparts listed on the NYSE were the smallest.

Gelman Study:⁷ Milton Gelman conducted a study analyzing the prices paid by four closed-end investment companies specializing in restricted securities investments. Based on an analysis of 89 transactions between 1968 and 1970, Gelman found both the mean and median discounts to be 33%. Almost 60% of the transactions were at discounts of 30% or more, and over one-third were at discounts of 40% or more.

⁷ Gelman, Milton. "An Economist-Financial Analyst's Approach to Valuing Stock of a Closely Held Company," *Journal of Taxation*, June 1972, pp. 353-354.

Trout Study:⁸ Robert Trout studied 60 transactions involving the purchase of restricted stock by mutual funds between 1968 and 1972. He observed a mean discount of 33.5%.

Moroney Study:⁹ In an article published in 1973, Robert Moroney presented the results of his study of the prices paid in 146 transactions for restricted securities by 10 registered investment companies. The mean discount in these transactions was 35.5%, and the median discount was 33%. Although the years covered in this study are likely to be 1969-1972, no specific years were given in the published account.

Maher Study:¹⁰ In 1976, Michael Maher published the results of a study of restricted stock discounts in 33 transactions taking place from 1969 to 1973. He found that the mean discount was 35.4%. The median discount calculated to be 33.3%.

Standard Research Consultants Study:¹¹ In 1983, Standard Research Consultants conducted a study of 28 private placements of common stock from October 1978 through June 1982. A median discount of 45% was observed.

Hertzel & Smith:¹² In a 1993 article published in the *Journal of Finance*, Hertzel & Smith analyzed a sample of 106 private placements from the 1980-1987 period with overall average and median discounts of 20.1% and 13.3%, respectively. A lower average discount was observed for registered shares. The authors theorized that the discounts observed in private placements can be explained as compensation to the investors for costs they incurred to reduce asymmetries of information. The authors performed regression analysis on the data to test their theory. They regressed the discount on a number of variables associated with increased uncertainty about firm value, such as evidence of distress or high market-to-book ratios.

Willamette Management Associates (“Willamette”) Study:¹³ Willamette Management Associates analyzed private placements of restricted stocks that occurred during the period from January 1, 1981 to May 31, 1984. Most of these

⁸ Trout, Robert R. “Estimation of the Discount Associated with the Transfer of Restricted Securities,” *Taxes*, June 1977, pp. 381-385.

⁹ Moroney, Robert E. “Most Courts Overvalue Closely Held Stocks,” *Taxes*, March 1973, pp. 144-154.

¹⁰ Maher, J. Michael. “Discounts for Lack of Marketability for Closely-Held Business Interests,” *Taxes*, September 1976, pp. 562-571.

¹¹ “Revenue Ruling 77-287 Revisited,” *SRC Quarterly Reports*, Spring 1983, pp. 1-3.

¹² Hertzel, M., and R. Smith (1993), “Market Discounts and Shareholder Gains for Placing Equity Privately,” *Journal of Finance*, 48, 459-485.

¹³ *Valuing a Business: The Analysis and Appraisal of Closely Held Companies* (Fifth Edition), Shannon P. Pratt and Alina V. Niculita (New York: McGraw Hill: 2008), p. 425.

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transactions occurred in 1983. Willamette identified 33 arm's length transactions during that period for which an unrestricted publicly traded equivalent was available. The median implied discount for the 33 transactions in this study was 31.2%.

Silber Study:¹⁴ In 1991, William Silber published the results of a study of restricted stock discounts in 69 transactions taking place between 1981 and 1988. He found that the mean discount was 33.8% and median was 35%. This study found larger discounts when the size of the restricted stock block was large in proportion to the total shares outstanding. Additionally, the study indicated that firms with higher revenues, earnings and market capitalizations are associated with lower discounts.

Bruce Johnson Study:¹⁵ Mr. Johnson conducted a restricted stock study in which he examined 72 transactions that occurred between 1991 and 1995. These transactions exhibited a median implied discount of 20%.

Columbia Financial Advisors, Inc. ("CFAI") Study:¹⁶ CFAI conducted a study of the sale of restricted securities in the U.S. in which they examined 23 private common equity placements over the period January 1, 1996 through April 30, 1997. The resulting mean discount was 21% and median discount was 14%. A similar study was repeated over the period January 1997 through December 1998 in which 15 transactions were identified. The mean discount was 13% and median discount was 9%.

Trugman Valuation Associates, Inc. ("TVA") Study:¹⁷ The intent of the TVA Study was to analyze implied restricted stock discounts associated with transactions that took place between January 2007 and December 2008. After a detailed screening process, TVA identified 80 transactions occurring between January 1, 2007 and August 19, 2008. Notably, TVA did not find any transactions that met its search criteria between August 19, 2008 and December 31, 2008, which encompasses the period of the financial market collapse in September and October 2008.

Separately, Empire sorted the transactions and broke the data set into two groups: (1) transactions that took place on or before November 15, 2007; and (2) transactions after November 15, 2007. Again, on November 15, 2007, the SEC

¹⁴ Silber, William L. "Discounts on Restricted Stock: The Impact of Illiquidity on Stock Prices," *Financial Analysts Journal*, July-August 1991, pp. 60-64.

¹⁵ "Restricted Stock Discounts: 1991-1995," *Shannon Pratt's Business Valuation Update* (March 1999): 1-5.

¹⁶ Aschwald, Kathryn F., "Restricted Stock Discounts Decline as Result of 1-Year Holding Period," *Shannon Pratt's Business Valuation Update*, May 2000, pp. 1-5.

¹⁷ Harris, William. "Trugman Valuation Associates, Inc. (TVA) Restricted Stock Study," *Business Valuation Review*, Volume 28, No. 3.

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announced the pending change in the Rule 144 required holding period from one year to six months. The statistics associated with each data set are shown in the following table.

TVA Study Data - Statistics

Transaction Dates	Number of Transactions	Mean Discount	Median Discount	Standard Deviation
1/1/07 – 11/15/07	46	17.9%	14.7%	14.8%
11/16/07 – 8/19/08 ¹⁸	34	18.4%	14.4%	16.9%
Overall	80	18.1%	14.4%	15.6%

TVA analyzed the data to assess the correlation between the size of the implied discount and several factors, including, but not limited to, the following: (1) volatility;¹⁹ (2) debt ratio; (3) trading volume; (4) shares placed per average volume (i.e., block size); (5) share turnover;²⁰ (6) market capitalization; (7) trailing twelve month revenue; (8) total assets; (9) book value of equity; and (10) days until registration. TVA found that historical stock price volatility was the main driver in the magnitude of the implied discounts based on its regression analysis. Although TVA considered the explanatory power of most other variables to be weaker, it noted that the directional trends suggested by the correlation coefficients were consistent with expectations. In general, TVA's quartile analysis by variable suggested that:

- The magnitude of implied discounts was positively correlated with measures of risk, such as volatility and debt ratios;
- The magnitude of implied discounts was negatively correlated with measures of liquidity, such as trading volume and share turnover;
- The magnitude of implied discounts was positively correlated with shares placed per average volume, or block size, as well as days until registration; and
- The magnitude of implied discounts was negatively correlated with measures of size, including market capitalization, revenue, total assets and book value.

TVA did not analyze the impact of dividend paying history on implied discounts, primarily because a significant majority of the 80 transactions involved non-dividend

¹⁸ No transactions occurred between August 19, 2008 and December 31, 2008.

¹⁹ As measured by one year annualized historical daily price volatility.

²⁰ Average volume divided by total shares outstanding.

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paying companies. Due to the extremely small number of companies in the sample which paid dividends, TVA concluded that such an analysis was unlikely to produce meaningful results.

TVA also completed a holding period analysis by analyzing the impact of contractual registration rights on implied discounts. TVA indicated that a large majority of the 80 transactions in the study had registration rights. TVA performed additional research to verify the actual registration date, and calculated the number of days between the transaction date and the actual registration date. If no registration statement was filed with respect to a specific transaction, TVA assumed that the securities remained unregistered for the entire required holding period.²¹ TVA separated this data into quartiles, resulting in the statistics shown in the following table.

TVA Analysis of Registration Rights

Quartile	Days Before Registration	Average Discount	Median Discount	Standard Deviation
1	0-31 days	11.6%	10.0%	8.0%
2	32-63 days	14.3%	12.9%	11.3%
3	64-185 days	20.4%	15.9%	18.4%
4	185+ days	26.9%	18.8%	18.6%

TVA's registration rights analysis suggests that implied discounts are positively correlated to implied holding periods. The growth in the standard deviation for each quartile also appears to be consistent with the notion that risk increases as the required holding period grows. However, Empire noted that the exact period of time between the transaction date and the registration date may not have been known in all cases at the time the transactions took place.

MPI 2011 Study:²² In 2011, MPI updated its prior discount study by including additional private placement transactions from 2000 to September 2009 and performing additional analyses of the data. The number of included transactions expanded from approximately 220 in the original MPI Study covering the 1980 to 1999 period to 1,863 between 1980 and 2009. Note that MPI excluded companies whose closing price was less than \$1.00 as these stocks were deemed to be speculative.

The study's authors asserted that private placement discounts are a function of company-specific factors, transaction-specific factors, and contemporaneous market conditions. For each transaction, MPI collected the following information: (1)

²¹ 365 days prior to the change in Rule 144 on February 15, 2008, and 182 days thereafter.

²² Angrist, E., H. Curtiss, III and D. Kerrigan, "Regression Analysis and Discounts for Lack of Marketability," *Business Valuation Review*, Volume 30, Number 1, pp. 36-48.

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transaction data such as transaction date, transaction price, stock price prior to the transaction, registration status, block size, and holding period; (2) issuer-specific data such as market capitalization, stock volatility and operating and financial metrics; and (3) market data such as stock market indices and interest rates. Then each transaction was classified based on registration status, registered, unregistered, or agreement to register, both at the transaction date and at the expiration of the holding period.

Initial Findings: MPI's initial findings that registration status and historical time periods had a meaningful impact on the implied discount. Each is discussed below.

Registration Status: Of the 1,863 transactions in the study, 402 were unregistered, 203 were registered, and 1,258 either had registration rights or agreements to register at a later date or were subsequently registered. As shown in the table below, the unregistered shares had the highest average discount, shares with some registration rights or were later registered exhibited a somewhat lower average discount, and registered shares had the lowest discount.

Discounts by Registration Status

Status	Observations	Average Discount
Unregistered	402	22.1%
Registration Rights/Agreements or Later Registered	1,258	15.0%
Registered	203	8.7%
Total	1,863	15.9%

Time Period: Transactions in unregistered shares were divided into four distinct time periods that match the changes in holding period restrictions: (i) prior to 1990 (time period I); (ii) between 1990 and April 1997 (time period II); (iii) between May 1997 and February 2008 (time period III); and (iv) after February 2008 (time period IV). The discounts by time period are shown in the following table.

Discounts by Time Period

Time Period	Observations	Average Discount	Median Discount
Pre-1990	79	30.5%	32.3%
1990-4/1997	110	25.1%	22.5%
5/1997 – 2/2008	164	20.8%	16.6%
Post 2/2008	49	5.9%	5.0%
Total	402	22.1%	19.6

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Regression Analysis & Conclusions: MPI performed a detailed regression analysis to measure the impact of a variety of factors, including: (1) registration status; (2) market conditions during the time period in which the transaction occurred, as measured by the 30-year Treasury yield and the S&P Twelve-Month Index; (3) the company's stock price volatility; (4) the company's market capitalization; (5) the volatility of the S&P; and (6) several company-specific factors, including price-to-book ratios, revenue, and prior year earnings. MPI had the observations listed below upon the completion of its study.

1. The changes in SEC Rule 144 holding periods have had a significant impact on private placement discounts, with sharp decreases in discounts as the holding period shortened.
2. Unregistered shares without the prospect of being registered in the near term resulted in large private placement discounts.
3. Private placement discounts were also affected by market conditions, as measured by yield on the 30-year Treasury (higher yields lead to lower discounts) and performance of the S&P 500 (stronger performance in the prior year leads to higher discounts).
4. The relationship between market capitalization and private placement discounts has varied over the years. Prior to 1997 (during the two year holding periods), there was a significant relationship between size and private placement discounts. After 1997, size seems to have less of an impact.
5. Volatility in the company's stock price had a significant impact on the private placement discount, as higher volatility leads to larger discounts.
6. Lastly, revenue, earnings, stock market volatility and industry factors had little impact on the private placement discounts.

Stout Risius Ross, Inc. ("SRR") Restricted Stock Study:²³ In 2011, Stout Risius Ross, Inc. published *The SRR Restricted Stock Study* (the "*SRR Study*"). The SRR Study included restricted stock transactions that had announcement dates between September 2005 and May 2010. According to SRR, this study: (1) provided updated data and analysis to measure the impact of the reduction in Rule 144 holding period from twelve months to six months, which was enacted on February 15, 2008; (2) helped to quantify, since the data included the financial crisis of 2008, the way in which restricted stock discounts change during different market environments and in periods of heightened volatility; and (3) provided a more robust and comprehensive data set by including numerous ways to analyze factors such as size, growth, profitability, risk, and financial market conditions.

²³ *The SRR Restricted Stock Study*. Stout Risius Ross, Inc., 2011.

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Screening Criteria: In order to minimize factors other than lack of marketability that could contribute to the restricted stock discount, SRR utilized the following screening criteria: (1) determination that the company was not a development-stage company; (2) establishment of a minimum \$1.00 stock price to remove the companies that were likely trading at a speculative price; (3) exclusion of financially distressed companies; (4) requirement of minimum six-month average daily trading volume greater than 10,000 shares in order to consider only actively traded companies; (5) removal of transactions between related parties; (6) exclusion of transactions involving financial institutions which may have issued restricted stock under duress in order to satisfy regulatory capital requirements; and (7) removal of transactions involving significant control attributes such as board seats.

Initial Findings: Based on the above criteria, 98 transactions involving companies in a variety of industries were selected. The price at which the transactions were consummated was then compared with the price one day prior to the transaction announcement date. Overall, these transactions exhibited average and median discounts of 10.9% and 9.3%, respectively.

Quantity of transactions over time: During market turmoil, companies often find it difficult to complete private placement transactions because there are fewer interested investors. During the financial crisis during the fourth quarter of 2008 and first quarter of 2009, there were no transactions that occurred that satisfied SRR's screening criteria.

Discounts by industry: SRR noted that different industries exhibited varying discounts. For example, the 18 transactions involving manufacturing companies exhibited an average discount of 14.6% while the 10 transactions involving transportation, communication, and utilities companies exhibited an average discount of 7.9%.

Discounts prior to and after Rule 144 change: SRR noted that the 73 transactions prior to enactment of the Rule 144 change in 2008 had median and average discounts of 9.3% and 10.6%, while the 25 transactions after had median and average discounts of 11.1% and 11.5%. This is contrary to what one would expect when the holding period was shortened from one year to six months. Additional factors may explain this trend, as discussed below.

1. Transaction activity declined drastically during the financial crisis in 2008. As a result, the small sample size after the rule change makes it difficult to draw effective conclusions.
2. The volatility for the overall stock market and the companies in the study increased significantly after 2008. It is possible that the increased market

volatility offset any decrease in the discount attributable to the shortened holding period.

3. The majority of transactions in the study included registration rights granted to the acquirer. The presence of registration rights mitigates any impact from the Rule 144 change as someone who has been granted registrations rights within six months would not be impacted by the change.

Statistical Analysis: In addition to the comparisons of discounts to industry and time period, SRR also performed two statistical analyses of the data. First, a linear regression was performed with the independent variable being company specific factors and the dependent variable being the restricted stock discount. Factors that were statistically significant at the 5% level were deemed to exhibit a “very strong” relationship. However, due to the nature of private placement transactions, few factors were significant at the 5% level. Therefore, a quartile analysis was also performed to determine if there were any apparent linear relationships for the remaining factors. Those factors that showed a consistently increasing trend (i.e., each subsequent quartile exhibited an equal or greater average discount than the prior quartile) were deemed to exhibit a “strong” relationship, those factors that showed a generally increasing trend (e.g., the third and fourth quartiles exhibited larger average discounts than the first and second quartiles) were deemed to exhibit a “moderate” relationship.

Very Strong Relationships: The following factors exhibited very strong relationships with the restricted stock discount.

1. *Volatility:* Investors were expected to demand larger discounts for companies with greater volatility. Volatility was determined to be significant at the 5% level and consistently increased from the first quartile to the fourth quartile, increasing from 6.3% to 16.6% as shown below.

Annualized Volatility

	1	2	3	4
Quartile Range	<36.7%	36.7% to 47.9%	47.9% to 68.9%	>68.9%
Average Discount	6.3%	8.7%	13.4%	16.6%
Median Discount	7.0%	8.5%	14.4%	16.1%

2. *Block size:* Larger blocks were expected to warrant a higher discount since it would take longer for an investor to liquidate them after the expiration of Rule 144 holding period. Block size (as measured by the shares placed as a percentage of shares outstanding) was determined to be significant at the 5% level and exhibited a very strong linear relationship as shown below.

Block Size

	1	2	3	4
Quartile Range	<6.6%	6.6% to 13.3%	13.3% to 19.3%	>19.3%
Average Discount	6.5%	10.6%	12.2%	14.2%
Median Discount	6.5%	9.1%	9.5%	12.4%

3. *Dividends*: Transactions involving dividend-paying companies were expected to feature lower discounts as consistent, meaningful dividends provide a current return and reduce the importance of an uncertain future liquidity event. The companies that paid a dividend traded at an average discount of 7.4% while discounts for non-dividend-paying companies were higher at 11.9%. The results were deemed to be significant at the 5% level and are summarized in the following table.

Dividends

	Dividends	No Dividends
# of Transactions	23	75
Average Dividend Yield	5.2%	0.0%
Average Discount	7.4%	11.9%
Median Discount	7.7%	10.1%

Strong Relationship: Companies with higher profitability were viewed as more stable and therefore investors were expected to require a smaller discount for these companies.

LTM EBITDA Margin

	1	2	3	4
Quartile Range	>30.2%	11.9% to 30.2%	5.0% to 11.9%	<5.0%
Average Discount	9.0%	10.3%	11.9%	12.2%
Median Discount	7.5%	9.3%	9.9%	11.0%

Moderate Relationships: The following factors exhibited moderate relationships with the restricted stock discount.

1. *Growth*: Companies with higher growth were expected to exhibit lower discounts since investors are compensated for their longer holding period with growth during that time period. SRR reviewed 21 growth factors and nearly every growth factor exhibited a moderate relationship. The strongest relationship related to EBITDA growth over the last fiscal year ("LFY") as shown below.

LFY EBITDA Growth

	1	2	3	4
Quartile Range	> 88.4%	32.0% to 88.4%	2.2% to 32.0%	< 2.2%
Average Discount	9.5%	10.0%	10.2%	11.9%
Median Discount	7.8%	10.1%	9.9%	10.6%

2. *Size*: Larger companies were expected to exhibit lower discounts since they are subject to less risk because they have established products and customers and greater liquidity. SRR considered various size metrics, including revenues, earnings, enterprise value, book value of equity, market capitalization, and total assets. The majority of these metrics resulted in a moderate relationship with the transaction discount.
3. *Leverage*: Companies with lower financial leverage were generally perceived as less risky and therefore were expected to exhibit lower discounts. SRR considered various leverage ratios, including interest coverage and debt/EBITDA. The majority of the leverage ratios predicted on interest coverage resulted in a moderate relationship, with the three-year average interest coverage ratio exhibiting the strongest relationship as shown below.

3-Year Average EBIT/Interest Expense

	1	2	3	4
Quartile Range	> 13.2x	2.8x to 13.2x	0.7x to 2.8x	< 0.7x
Average Discount	7.9%	11.8%	11.8%	12.2%
Median Discount	7.7%	13.3%	9.5%	9.2%

Conclusion: Overall, the transactions SRR analyzed exhibited average and median discounts of 10.9% and 9.3%, respectively, which were generally lower than restricted stock discounts from prior years when holding periods were longer. SRR also concluded that the Rule 144 change appeared to have had minimal impact on private placement discounts due to the registration rights attached to these transactions. Additionally, the global financial crisis resulted in a drastic decline in private placement transactions due to investors' flight to quality. Lastly, SRR concluded that the most reliable factors influencing the transaction discounts were volatility, block size, dividends, profitability, growth, and size.

Quantitative Analysis of FMV Database

A. FMV Restricted Stock Study

Overview: In 2013, FMV updated *The FMV Restricted Stock Study*^{TM 24} (the “2013 Discount Study”). At March 2013, the 2013 Discount Study contained data on 779 restricted stock transactions occurring from 1980 to 2013. The study provided data on approximately 50 variables for each transaction. FMV used multiple techniques to define the market reference price including: (1) the stated discount, if explicitly in the language describing the transaction; (2) the closing market price as of the date prior to the agreement date; or (3) the closing market price as of the day prior to either the announcement date or the closing date, whichever occurred first. For many transactions in the 2013 Discount Study, only the month of the transaction, rather than the exact transaction date, was specified. In those instances, FMV used the highest and lowest average stock price for the month of the transaction.

Analysis: In its analysis, FMV eliminated all transactions which occurred at a premium to the market price. It is assumed that these transactions had deal-specific characteristics that were available to a specific investor, and are not generally representative of the overall market for restricted stocks. When transactions involving premiums are excluded, the sample set declines to 715 transactions. This group of 715 transactions exhibited an average restricted stock discount of 21%, and a median restricted stock discount of 16.1%. A summary of transactions by time periods, which coincides with changes in the Rule 144 holding period, is presented in the following table.

FMV Restricted Stock Study Transactions²⁵

Time Period	Observations	Median Discount
Pre-1990	65	23.7%
1990 - 3/31/97	178	21.1%
4/1/97 - 11/15/07	342	15.7%
11/16/07 - 2013	130	12.0%
Total	715	16.1%

²⁴ *Determining Discounts for Lack of Marketability: A Companion Guide to The FMV Restricted Stock Study*.TM FMV Opinions, Inc., 2013 (data within study current through March 2013).

²⁵ Excluding transactions that transacted at a premium.

Several conclusions reached by the 2013 Discount Study are listed below.

1. The median discounts varied slightly across industries. This conclusion is based upon an analysis of 715 underlying transactions by primary SIC grouping. However, FMV noted that differences between observed discounts were more the result of differing key financial data than from the SIC group itself. This supports the assertion that the most important determinants of marketability are: (1) company-specific risk factors; and (2) the differential in observed discounts between small and large blocks of restricted stock.
2. Observed discounts tend to increase in periods of overall economic and financial uncertainty.
3. Observed discounts tend to be inversely related to measures of company size, including revenue, book value, market value, and total assets; i.e., as these measures increase, discounts tend to decrease. Companies with larger revenues, book value, market value, or total assets will tend to be more financially stable than smaller companies, suggesting a lower degree of financial risk.
4. Observed discounts tend to be higher for companies with lower market values of equity. The market capitalization is perceived as a measure of increased financial risk.
5. Observed discounts tend to be inversely related to profitability. No clear relationship was identified between the absolute dollar value of a firm profit and observed discounts. However, profitable firms (as measured by net profit margin) were observed to have lower discounts than firms which were not profitable.
6. Dividend-paying firms have lower observed discounts than non-dividend paying firms.
7. The 2013 Discount Study identified the market-to-book ("MTB") ratio as a measure of balance sheet risk not tied directly to firm size. It was observed that discounts tended to increase as MTB ratios increased. Additionally, firms with a market value below book value, or firms with a negative book value, were also considered more risky.
8. Observed discounts tend to increase as stock price volatility increases. Stock price volatility is an observable measure of risk. As risk increases, discounts can be expected to increase.
9. The size of the block of restricted stock being sold impacts the expected holding period because of the limitations imposed by Rule 144 following the expiration of the initial restriction period; i.e., larger blocks of restricted stock

are frequently subject to the “dribble-out” provisions of Rule 144, which limits the number of shares that can be sold in a given three-month period. As a result, the required holding period generally increases with block size. Observed discounts increase as the expected holding period increases, with holding periods expressed in terms of block size. In the valuation of interests in closely-held companies, *regardless of the block size of the subject interest in the closely-held company*, the transaction in the data set involving large blocks of restricted stock become most comparable because they represent the most illiquid blocks of restricted stocks being traded.

Registration Rights Analysis: FMV indicated that registration rights may be negotiated with the issuing company to provide for possible liquidity prior to the end of the required holding period. The presence of registration rights agreements tends to improve the liquidity of restricted stock. When the data in FMV’s study is adjusted to remove transactions including registration rights, the trend in the implied discounts tends to confirm this conclusion. This is presented in the table below.

FMV Restricted Stock Study Transactions²⁶

Time Period	Observations	Median Discount
Pre-1990	58	23.2%
1990 - 3/31/97	141	21.0%
4/1/97 - 11/15/07	169	21.1%
11/16/07 - 2013	27	14.4%
Total	395	20.2%

B. Empire’s Analysis of the 2013 Discount Study Data

Overview: The underlying data from the 2013 Discount Study can be used to estimate a discount for lack of marketability for closely-held companies. The 2013 Discount Study recommends using a multi-step process in which: (1) a quantitative analysis of the company-specific risk factors result in an “as if” publicly traded restricted stock discount (the “Restricted Stock Equivalent Discount”); and (2) a second quantitative analysis is used to estimate an incremental discount above the Restricted Stock Equivalent Discount to recognize the similar illiquidity characteristics between privately-held companies and large blocks of restricted stock (the “Private Company Discount Increment”).

Empire analyzed the data set in the 2013 Discount Study as guidance in estimating discounts for lack of marketability for certain interests in privately-held businesses.

²⁶ Excluding transactions that transacted at a premium and those that included registration rights.

We then applied the two-step process described in the preceding paragraph to estimate a reasonable discount for lack of marketability to apply in valuing the interests.

We applied the quantitative analysis described in the first step using a sample of the most liquid restricted stock transactions to estimate a Restricted Stock Equivalent Discount, limiting the sample to transactions involving block sizes of 20% or less of a firm's outstanding stock following the restricted stock transaction.²⁷ We then estimated a range of Private Company Discount Increments based on the discount differential between small and large block restricted stock transactions.

Analysis: The 2013 Discount Study dataset included 779 transactions. Between the time when FMV published the 2013 Discount Study and when Empire analyzed the underlying data (September 2013), three additional transactions were added to database. As such, 782 transactions were considered in Empire's analysis. Again, the discounts observed in the study data are calculated from the difference between the price for the restricted shares and one of the following, depending on the level of pricing disclosure: (1) the stated discount, if explicitly stated in the language describing the transaction; (2) the closing market price as of the date prior to the agreement date; (3) the closing market price as of the day prior to either the announcement date or the closing date, whichever occurred first; or (4) the average of the highest and lowest market price of the company's shares for the month of the transaction if the specific transaction date was not disclosed.

Empire first reduced the sample to 717 transactions by removing 65 transactions which occurred at a premium. These transactions were removed because it was considered to be highly likely that observed premiums were due to material company-specific or transaction-specific factors, as an illiquidity premium is counterintuitive and not consistent with financial theory.

Empire further reduced the data set by excluding 320 transactions in which the subject block of restricted stock included registration rights. It is recognized that registration rights improve marketability, and that the shares of closely-held companies do not have such rights. This screen reduced the sample set to 397 transactions.

The remaining sample of 397 transactions was separated into two groups, based on block size, using a break point between the small and large block samples of 20%

²⁷ Because of the relatively long periods generally required to liquidate larger blocks of restricted stock following the expiration of the initial restricted period, larger blocks of restricted stock in the 2013 Discount Study data set tend to have illiquidity characteristics more similar to stock in privately-held companies (in blocks of any size), for which no market exists. Therefore, an adjustment based on the differential discounts between small and large blocks of restricted stock is appropriate to estimate a discount for lack of marketability.

of the subject firm's outstanding stock following the transaction. There were 345 transactions involving blocks of less than 20%, and 52 transactions involving blocks greater than 20%.

Finally, the 345 transactions involving blocks less than 20% were sorted based on the following metrics selected by Empire: (1) revenue; (2) market value; (3) book value; (4) total assets; (5) volatility; (6) net profit margin; and (7) dividends. In selecting these metrics, several factors were considered, including, but not limited to, the following: (1) analysis of revenue, market value, book value, total assets, and volatility produced clear trends in observed discounts across quintiles in the data set; (2) there were clear differences in median observed discounts between profitable and unprofitable firms, as measured by net profit margin; and (3) there were clear differences in median observed discounts between dividend-paying and non-dividend paying firms. Additional measures of profitability were not included in the selected metrics because the determinant of financial risk appeared to be profitability versus lack of profitability, rather than the relative magnitude of profit margins, and because this test could be applied to all firms.

Empire opted not to utilize the MTB ratio as a measure of risk because it was recognized that challenges exist in interpreting the data and applying it appropriately. While an MTB ratio below 1.0 times may indicate financial distress, high MTB ratios will not necessarily be caused by balance sheet risk. For example, a service business may have stable cash flows and a low asset base. If the market places value on the company's stable cash flows, it is likely that the company will exhibit an MTB ratio in excess of 1.0 times. As a result, one cannot assume that a high MTB ratio is a clear indicator of financial risk.

Conclusions: The results of Empire's analysis are summarized below.

- **Analysis of Size Metrics:** Implied restricted stock discounts are inversely related to a company's size, measured as revenue, market value, book value or total assets. This is demonstrated by the trend in the median discounts for each quintile.
- **Analysis of Risk Metrics:** Discounts are positively correlated with volatility, given that a greater lack of marketability discount would be demanded by an investor for taking on greater risk.
- **Analysis of Profitability Metrics:** Discounts are inversely related to net profit margins. Many of the companies in the data set are start-up firms which have not yet reached profitability. For the 91 companies with a net profit margin greater than 0%, the median discount was 14.5%. This compared to a median of 22.6% for the 229 companies with negative margins.

- **Dividend Payments:** Finally, discounts for dividend paying firms are less than for those not paying dividends. This result also likely reflects the fact that dividends provide shareholders with more immediate economic returns, partially mitigating the impact of illiquidity. A company's dividend history and expectations for dividends going forward should therefore be considered, as a richer payout policy provides an early form of liquidity.

Block Size Analysis: In addition to the initial holding period requirements under Rule 144, restricted stock is subject to a “dribble out” provision following the expiration of the holding period. This provision limits the volume of quarterly resales to the greater of: (1) one percent of the total shares outstanding; or (2) the average weekly trading volume for the four weeks preceding the sale.²⁸ Therefore, a 20% block could take up to five years after the expiration of the initial holding period to fully resell. Because of the relatively long periods generally required to liquidate larger blocks of restricted stocks following the expiration of the initial restriction period, larger blocks of restricted stock in the 2013 Discount Study data set tend to have illiquidity characteristics more similar to stock in privately-held companies (in blocks of any size), or which no market exists.

As described earlier, there were 52 transactions involving blocks of more than 20%. These were reviewed, and segmented further as block size increased up to 40% and greater. This additional segmentation further reflects that observed median discounts tend to increase with block size.

Block Size Comparative Analysis

	Observations	Median Discount
More than 40%	5	42.3%
More than 35%	6	40.4%
More than 30%	12	41.6%
More than 25%	23	38.5%
More than 20%	52	25.5%
20% or Less	345	20.0%

The median discount for blocks less than 20% was 20.0%, while median discounts for transactions involving larger blocks ranges from 25.5% to 42.3%. These results demonstrate that larger blocks of restricted stock are more illiquid than smaller blocks of restricted stock.

As noted earlier, larger blocks of restricted stock (i.e., blocks representing more than 20% of post-transaction shares outstanding) are considered to be more similar

²⁸ For OTCBB and Pink Sheets companies, only the 1% of outstanding metric applies.

to the securities of privately-held companies (in blocks of any size) due to the liquidity issues they face. Therefore, if a Restricted Stock Equivalent Discount is estimated based on an analysis of the subject company's financial risk characteristics relative to small blocks of restricted stock (i.e., blocks representing less than 20% of post-transaction shares outstanding), an adjustment based on the differential discounts between small and large blocks of restricted stock is appropriate to estimate a discount for lack of marketability. As discussed previously, this is referred to as the Private Company Discount Increment.

C. Quantitative Analysis Based on 2013 Discount Study

Based on Empire's analysis of the 2013 Discount Study data, we estimated a reasonable range of discounts for lack of marketability. In doing so, an estimated Restricted Stock Equivalent Discount was developed by comparing the subject's financial metrics to the size, risk, profitability, and distribution paying metrics analyzed by Empire in the previous section. Next, a range of Private Company Discount Increments was developed based on the block size analysis described earlier. This results in an estimated range of reasonable discounts for lack of marketability for the subject interest.

Restricted Stock Equivalent Discount: The seven variables which were identified and described earlier are considered in the calculation of the Restricted Stock Equivalent Discount. They include measures of size (revenue, market value, book value, and total assets), volatility, net profit margin, and dividends.

Private Company Discount Increment: As discussed earlier, the selection of the Restricted Stock Equivalent Discount was based upon an analysis of the subject's financial characteristics relative to the financial characteristics of transactions involving blocks of restricted stock representing less than 20% of the post-transaction shares outstanding. However, it was shown earlier that transactions involving large blocks of restricted stock (i.e., greater than 20% of the post-transaction shares outstanding) have illiquidity characteristics more in common with the equity of closely-held companies. This is because the volume limitations imposed by Rule 144 following the expiration of the initial restriction period generally prevent large blocks of restricted stock from being sold quickly; i.e., the liquidity issues associated with larger blocks of restricted stock are generally much more significant than those associated with smaller blocks of restricted stock due to the Rule 144 volume limitations.

Apollo Entities
Defined Terms for Black Family Partners LP Investments

A. Apollo Operating Group Units (“AOG Units”)

- A signed copy of the Amended and Restated Tax Receivable Agreement by and among APO Corp., Apollo Principal Holdings II, LP (“APH II”), Apollo Principal Holdings IV, LP (“APH IV”), Apollo Principal Holdings VI, LP (“APH VI”), Apollo Principal Holdings VIII, LP (“APH VIII”), Apollo Management Holdings (“AMH”) and any other entity or persons which APO Corp acquired an interest from, dated May 6, 2013 (the “TRA”);
- A signed copy of Apollo’s Amended and Restated Limited Liability Company Agreement, dated July 13, 2007 (the “Apollo Agreement”);
- A signed copy of the Agreement Among Principals, dated July 13, 2007 (the “Principals Agreement”);
- A signed copy of the Amended and Restated Exchange Agreement, dated May 6, 2013 (the “Exchange Agreement”);
- A signed copy of the Shareholders Agreement, dated July 13, 2007, and a signed copy of the First Amendment and Joinder, dated August 18, 2009, by and among Apollo, AP Professional Holdings ■■■, BRH Holdings ■■■, Black Family Partners ■■■, MJR Foundation LLC, Leon D. Black, Marc J. Rowan and Joshua Harris (the “Shareholder Agreement”);
- A copy of BRH Holdings, ■■■’s (“BRH”) initial Exempted Limited Partnership Agreement, dated July 13, 2007 (the “BRH Agreement”); and

B. Apollo Co-Invest Entities

The Co-Invest Entities¹ are invested in funds affiliated with Apollo.

- Apollo Co-Investors IV, LLC (“ACIV”)
- Apollo Co-Investors V, LLC (“ACV”)
- Apollo Co-Investors VI (A), LLC (“ACVI”)²
- Apollo Credit Opportunities Co-Investors III (A), LP (“ACC III”)

¹ Collectively, ACIV, ACV, ACVI, ACC III, AVC, ASC and FCI II are referred to as the “Co-Invest Entities.”

² ACVI is formerly known as Apollo Co-Investors VI, LLC

Apollo Entities
Defined Terms for Black Family Partners LP Investments

- Apollo SOMA Co-Investors, LLC (“ASC”)
- FCI Co-Investors II (A), [REDACTED]. (“FCI II”)

C. Apollo Related Entities

- AP Technology Partners LLC (“APTP”)
- AP SHL Investors LLC (“APSHL”)

D. Investments Not related to Apollo

- Athene Holding, Ltd. (“AHL”)
- Anchorage Capital Partners (“ACP”)
- Canyon Value Realization Fund (“CVRF”)
- King Street Capital (“KSC”)
- Lone Cascade, LP (“LC”)
- Millennium Group USA (“MG”)
- HAO Capital Fund II, LP (“HAO”)
- Wolfensohn Capital Partners, LP (“WCP”)
- Tenfore Holdings Fund I, LP (“TEN4”)
- iCrete LLC (“iCrete”)
- Truckast LLC (“Truckast”)
- Knowledge Universe Education, LP (“KUE”)
- Environmental Solutions Worldwide (“ESWW”)
- Rally Labs, LLC (“Rally”)
- Artbinder Inc. (“Artbinder”)
- Curation Media, Inc. (“Curation Media”)

COMPARATIVE INCOME STATEMENTS**BLACK FAMILY PARTNERS, LP****FOR THE YEARS ENDED DECEMBER 31,**

	HISTORY	HISTORY	HISTORY	INTERNAL HISTORY	INTERNAL HISTORY
	2010	2011	2012	2013	2014
Interest Income	39,559,148	33,249,458	50,219,778	4,661,369	651,615
Dividends	2,276,840	7,417,671	27,525,302	482,906	482,906
Portfolio Income	3,403,283	4,774,754	10,060,768	0	0
Passthrough Income	0	2,119,698	133,861	0	0
Net Short-Term Capital Gain (Loss)	20,437,720	6,212,510	4,584,881	0	0
Net Long-Term Capital Gain (Loss)	20,885,007	70,875,303	219,985,333	7,409,899	(2,150,877)
TOTAL REVENUES	86,561,998	124,649,394	312,509,923	12,554,174	(1,016,356)
Depreciation	5,488	0	5	0	0
Deductions Related to Portfolio Income	8,880,968	8,173,457	10,634,735	18,500,000	21,000,000
Charitable Contributions	181	108,728	1,722	0	0
Travel and Entertainment	0	7,642	473,595	0	0
Miscellaneous Expenses	0	0	0	1,682,909	2,300,576
Total Operating Expenses	8,886,637	8,289,827	11,110,057	20,182,909	23,300,576
NET OPERATING INCOME	77,675,361	116,359,567	301,399,866	(7,628,735)	(24,316,932)
Ordinary Income from Partnerships	(1,161,368)	14,762,810	52,580,261	0	0
Interest Expense	(5,657,423)	(20,509,986)	(24,876,987)	0	0
Real Estate Income	4,249	5,455	17,113	0	0
Amortization Expenditures	(919,361)	(919,833)	(734,176)	0	0
Foreign Taxes	(66,945)	(930,893)	(1,028,670)	0	0
Unrealized Gains (Loss)	0	0	0	1,950,867,859	(472,018,285)
Other Income	0	0	0	1,938,329	13,055,195
Total Other Income (Expense)	(7,800,848)	(7,592,447)	25,957,541	1,952,806,188	(458,963,090)
PRE-TAX INCOME	69,874,513	108,767,120	327,357,407	1,945,177,453	(483,280,022)
Provision (Benefit) for Taxes	0	0	0	0	0
NET INCOME	69,874,513	108,767,120	327,357,407	1,945,177,453	(483,280,022)

Financial Statements for 2010 through 2012 compiled using the records of Raich, Ende, Malter & Co LLP and are presented on a non-GAAP basis. Financial Statements for 2013 and forward are internally prepared by Management.

COMPARATIVE BALANCE SHEETS**BLACK FAMILY PARTNERS, LP****FOR THE YEARS ENDED DECEMBER 31,**

	HISTORY 2010	HISTORY 2011	HISTORY 2012	INTERNAL HISTORY 2013	INTERNAL HISTORY 2014
ASSETS					
Cash and Equivalents	56,286,395	13,289,724	18,748,910	5,819,649	18,328,838
Accrued Interest	0	0	0	896,557	203,013
Investments	987,923,724	965,786,061	1,139,271,686	0	0
Other Receivables	0	0	0	3,315,619	10,286,821
Total Current Assets	1,044,210,119	979,075,785	1,158,020,596	10,031,825	28,818,672
Loans Receivable	0	75,000,000	136,000,000	99,547,077	61,491,093
Due To/From LBF Holdings, LLC	0	0	0	2,105,809	0
Apollo Investment Corp Stocks	8,319,017	8,318,966	8,319,017	0	0
Marketable Securities and Direct Investments	0	0	0	101,974,930	110,863,533
Apollo Investments (Private)	0	0	0	3,002,864,421	2,240,579,333
Investment Partnerships (Private)	0	0	0	61,947,079	57,367,722
Deferred Tax Asset - TRA Benefit	0	0	0	302,797,259	228,956,000
Deferred Tax Asset - TRA Div 2007	0	0	0	87,113,203	95,798,116
Other Assets	0	0	5,081,091	10,695,823	202,342
Total Other Assets	8,319,017	83,318,966	149,400,108	3,669,045,602	2,795,258,139
TOTAL ASSETS	1,052,529,136	1,062,394,751	1,307,420,704	3,679,077,427	2,824,076,811
LIABILITIES & PARTNERS' CAPITAL					
TOTAL LIABILITIES	0	0	78,200	4,720,594	0
Partners' Capital Accounts	1,052,529,136	1,062,394,751	1,307,342,504	3,674,356,833	2,824,076,811
Total Partners' Capital	1,052,529,136	1,062,394,751	1,307,342,504	3,674,356,833	2,824,076,811
TOTAL LIABILITIES & PARTNERS' CAPITAL	1,052,529,136	1,062,394,751	1,307,420,704	3,679,077,427	2,824,076,811

Financial Statements for 2010 through 2012 compiled using the records of Raich, Ende, Malter & Co LLP and are presented on a non-GAAP basis. Financial Statements for 2013 and forward are internally prepared by Management.

COMPARATIVE CASH FLOW STATEMENTS**BLACK FAMILY PARTNERS, LP****FOR THE YEARS ENDED DECEMBER 31,**

	HISTORY 2010	HISTORY 2011	HISTORY 2012	INTERNAL HISTORY 2013	INTERNAL HISTORY 2014
CASH FLOW FROM OPERATING ACTIVITIES					
Net Income	69,874,513	108,767,120	327,357,407	1,945,177,453	(483,280,022)
Adjustments to reconcile Net Income to Net Cash					
Provided from Operating Activities					
Depreciation	5,488	0	5	0	0
Change in Accounting Convention	0	0	0	904,751,039	0
(Inc.) Dec. in Accrued Interest	62,496	0	0	(896,557)	693,544
(Inc.) Dec. in Loans Receivable	45,000,000	(75,000,000)	(61,000,000)	36,452,923	38,055,984
(Inc.) Dec. in Other Assets	0	0	(5,081,091)	(5,614,732)	10,493,481
(Inc.) Dec. in Other Receivables	0	0	0	(3,315,619)	(6,971,202)
Due To/From LBF Holdings, LLC	280,983,533	0	0	(2,105,809)	2,105,809
Inc. (Dec.) in Total Liabilities	0	0	78,200	4,642,394	(4,720,594)
Net Cash Provided By (Used In) Operating Activities	395,926,030	33,767,120	261,354,521	2,879,091,091	(443,623,000)
CASH FLOW FROM INVESTING ACTIVITIES					
Capital Expenditures	(5,488)	0	(5)	0	0
Investments	(23,027,737)	22,137,663	(173,485,625)	1,139,271,686	0
Apollo Investment Corp Stocks	(8,319,017)	51	(51)	8,319,017	0
Marketable Securities and Direct Investments	0	0	0	(101,974,930)	(8,888,603)
Apollo Investments (Private)	0	0	0	(3,002,864,421)	762,285,088
Investment Partnerships (Private)	0	0	0	(61,947,079)	4,579,357
Deferred Tax Asset - TRA Benefit	0	0	0	(302,797,259)	73,841,259
Deferred Tax Asset - TRA Div 2007	0	0	0	(87,113,203)	(8,684,913)
Net Cash Provided By (Used In) Investing Activities	(31,352,242)	22,137,714	(173,485,681)	(2,409,106,189)	823,132,188
CASH FLOW FROM FINANCING ACTIVITIES					
Contributions	0	93,466,375	0	0	0
Distributions	(342,109,052)	(192,367,880)	(82,409,654)	(482,914,162)	(367,000,000)
Prior Year Adjustment	770	0	0	0	0
Net Cash Provided By (Used In) Financing Activities	(342,108,282)	(98,901,505)	(82,409,654)	(482,914,162)	(367,000,000)
NET INCREASE (DECREASE) IN CASH	22,465,506	(42,996,671)	5,459,186	(12,929,260)	12,509,188
Beginning Cash	33,820,889	56,286,395	13,289,724	18,748,910	5,819,649
Ending Cash	56,286,395	13,289,724	18,748,910	5,819,650	18,328,838

Financial Statements for 2010 through 2012 compiled using the records of Raich, Ende, Malter & Co LLP and are presented on a non-GAAP basis. Financial Statements for 2013 and forward are internally prepared by Management.

CALCULATION OF NET ASSET VALUE
BLACK FAMILY PARTNERS, LP
AS OF SEPTEMBER 3, 2015

ASSETS	SUPPORTING EXHIBIT	CAPITAL ACCOUNT BALANCE	MARKET ADJUSTMENTS	ADJUSTED BOOK VALUE	% of Assets
Cash & Marketable Securities					
Bank of America - Checking Accounts & Money Market Funds	n/a	\$20,955,580	\$0	\$20,955,580	1.0%
JP Morgan Brokerage Account - Cash	n/a	\$9,433	\$0	\$9,433	0.0%
JP Morgan Brokerage Account - Apollo Investment Corp. (Ticker:AINV)	n/a	\$3,896,445	\$0	\$3,896,445	0.2%
JP Morgan Brokerage Account - Environmental Solutions World (Ticker:ESWW)	n/a	\$759,020	(\$75,902)	\$683,118	0.0%
JP Morgan Brokerage Account - AP Alternative Assets (Ticker:AAA - Amsterdam)	n/a	\$1,051,087	\$0	\$1,051,087	0.1%
K12, Inc. (Ticker: LRN)	n/a	\$851,810	\$0	\$851,810	0.0%
Apollo Fixed Term Entities (Private Equity Direct Interests)					
Apollo Co-Investors IV, LLC	E-1 through E-3	\$391,900	(\$101,900)	\$290,000	0.0%
Apollo Co-Investors V, LLC	E-1 through E-3	\$2,213,581	(\$553,581)	\$1,660,000	0.1%
Apollo Co-Investors VII (A), LLC	E-1 through E-3	\$19,774,934	(\$2,964,934)	\$16,810,000	0.8%
Apollo Credit Opportunities Co-Investors III (A), LP	E-1 through E-3	\$8,207,932	(\$2,867,932)	\$5,340,000	0.3%
Non-Apollo Fixed Term Entities (Private Equity Direct Interests)					
HAO Capital Fund II LP	E-1 through E-3	\$4,251,787	(\$851,787)	\$3,400,000	0.2%
Woffensohn Capital Partners LP	E-1 through E-3	\$1,629,472	(\$569,472)	\$1,060,000	0.1%
Tenfore Holdings Fund I, LP	E-1 through E-3	\$1,010,023	(\$350,023)	\$660,000	0.0%
Apollo Capital Market Funds (Hedge Fund Direct Investments)					
Apollo SOMA Co-Investors, LLC	F-1 through F-3	\$2,778,750	(\$148,750)	\$2,630,000	0.1%
FCI Co-Investors II (A), LP	F-1 through F-3	\$14,883,721	(\$4,463,721)	\$10,420,000	0.5%
Athene Holding, Ltd.	F-1 through F-3	\$52,000,000	(\$15,600,000)	\$36,400,000	1.8%
AP Technology Partners, (b)(6)	F-1 through F-3	\$25,579	(\$7,579)	\$18,000	0.0%
AP SHL Investors, LLC	F-1 through F-3	\$0	\$0	\$0	0.0%
Non-Apollo Capital Market Funds (Hedge Fund Direct Investments)					
Anchorage Capital Partners	F-1 through F-3	\$18,586,721	(\$926,721)	\$17,660,000	0.9%
Canyon Value Realization Fund	F-1 through F-3	\$19,626,613	(\$786,613)	\$18,840,000	0.9%
King Street Capital	F-1 through F-3	\$1,095,198	(\$325,198)	\$770,000	0.0%
Lone Cascade, LP	F-1 through F-3	\$26,973,043	(\$1,353,043)	\$25,620,000	1.3%
Millennium Group USA	F-1 through F-3	\$28,867,183	(\$1,157,183)	\$27,710,000	1.4%
BRH Holdings (Apollo Operating Group)					
Apollo Operating Group units	G-1	\$1,761,816,154	(\$261,816,154)	\$1,500,000,000	74.8%
Tax Receivable Agreement (TRA) Benefit for Apollo Operating Group units	G-3	\$0	\$163,000,000	\$163,000,000	8.1%
TRA Dividend - July 2007 Transaction	G-5	\$0	\$83,000,000	\$83,000,000	4.1%
Miscellaneous Interests					
Truckee LLC		\$0	\$0	\$0	0.0%
Knowledge Universe Education LP		\$10,536,490	(\$2,107,298)	\$8,429,192	0.4%
KU Management, Inc.		\$14,485	(\$2,897)	\$11,588	0.0%
Curation Media		\$1,300,000	(\$455,000)	\$845,000	0.0%
ESWW Convertible Notes		\$3,069,883	(\$789,058)	\$2,280,825	0.1%
Rally Labs, LLC		\$181,277	(\$63,447)	\$117,830	0.0%
Artbinder Inc.		\$9,998	(\$3,499)	\$6,499	0.0%
Promissory Notes and Receivables					
Due from Leon D. Black, net		\$42,122,440	\$0	\$42,122,440	2.1%
Due from LBF Holdings LLC		\$3,380,880	\$0	\$3,380,880	0.2%
Due from PLB LLC, including accrued interest		\$3,210,030	\$0	\$3,210,030	0.2%
Redemption Receivable		\$850,886	\$0	\$850,886	0.0%
Due from BRH Holdings, LP		\$127,695	\$0	\$127,695	0.0%
TOTAL ASSETS		\$2,056,460,030	(\$52,341,692)	\$2,004,118,338	100%
LIABILITIES & PARTNERS' CAPITAL					
TOTAL LIABILITIES		\$0	\$0	\$0	
PARTNERS' CAPITAL		\$2,056,460,030	(\$52,341,692)	\$2,004,118,338	
TOTAL LIABILITIES & CAPITAL		\$2,056,460,030	(\$52,341,692)	\$2,004,118,338	
Adjusted Book Value				\$2,004,118,338	
Pro Rata ABV of Subject Interest		1.0%		\$20,041,183	
Less: Combined Discount for Lack of Control and Marketability		15.0%		(\$3,006,178)	
Fair Market Value of a 1.0% Limited Partnership Interest				\$17,035,006	
Pro Rata Fair Market Value of a 1.0% Limited Partnership Interest, rounded				\$17,000,000	

PRIVATE EQUITY INVESTMENTS - CAPITAL ACCOUNT ANALYSIS
BLACK FAMILY PARTNERS, LP
AS OF SEPTEMBER 3, 2015

#	Fund Name	Total Capital Commitment	Total Capital Contributed	Distributions Since Inception	% of Capital Called (1)	Capital Account Balance (2)
Investment Positions						
1	Apollo Co-Investors IV, LLC	\$26,099,000	\$26,816,435	\$42,884,715	103%	\$391,900
2	Apollo Co-Investors V, LLC	\$23,647,681	\$34,661,561	\$69,508,216	147%	\$2,213,581
3	Apollo Co-Investors VI (A), LLC	\$45,503,255	\$62,201,877	\$77,709,899	137%	\$19,774,934
4	Apollo Credit Opportunities Co-Investors III (A), LP	\$15,000,000	\$10,997,013	\$2,094,551	73%	\$8,207,932
5	HAO Capital Fund II LP	\$6,000,000	\$5,040,000	\$2,309,849	84%	\$4,251,787
6	Wolfensohn Capital Partners LP	\$5,000,000	\$4,875,729	\$2,711,206	98%	\$1,629,472
7	Tenfore Holdings Fund I, LP	\$1,500,000	\$900,308	\$78,966	60%	\$1,010,023
Total Capital Account Balance						\$37,479,629

(1) Certain distributions were callable, allowing for called amounts greater than 100%.

(2) The most recent quarterly capital account balance was adjusted to reflect contributions and distributions after the statement date and as of the Valuation Date.

PRIVATE EQUITY INVESTMENTS - RISK ANALYSIS
BLACK FAMILY PARTNERS, LP
AS OF SEPTEMBER 3, 2015

Valuation Date 9/3/2015

#	Fund Name	Contractual Termination Date	Total Extensions Possible (in years)	Estimated Years Remaining in Term	Lifecycle Stage (1)	Primary Investment Structure (2)	Expected Cause of Growth in Value	(\$) Remaining Capital Commitment (3)	(%) Remaining Capital Commitment	Distributed Cash as a % of Contributed Capital (4)	Net Multiple of Contributed Capital (5)	Preferred Return %	Carried Interest %
Investment Positions													
1	Apollo Co-Investors IV, LLC	9/30/2010	N/A	2.00	VC/H	D	App	\$127,203	0.5%	159.9%	1.6	0.0%	0.0%
2	Apollo Co-Investors V, LLC	4/30/2012	N/A	2.00	VC/H	D	App	\$1,473,813	6.2%	200.5%	2.1	0.0%	0.0%
3	Apollo Co-Investors VI (A), LLC	1/12/2017	2.00	1.36 (6)	VC/H	D	App	\$1,774,518	3.9%	124.9%	1.6	0.0%	0.0%
4	Apollo Credit Opportunities Co-Investors III (A), L	9/11/2019	3.00	4.02	I	D	App	\$5,670,973	37.8%	19.0%	0.9	0.0%	0.0%
5	HAO Capital Fund II LP	12/5/2016	2.00	1.26 (7)	VC/H	D	App	\$960,000	16.0%	45.8%	1.3	8.0%	20.0%
6	Wolfensohn Capital Partners LP	2/23/2019	3.00	3.48	VC/H	D	App	\$1,017,706	20.4%	55.6%	0.9	8.0%	20.0%
7	Tenfore Holdings Fund I, LP	4/1/2023	2.00	7.58	VC/H	D	App	\$621,325	41.4%	8.8%	1.2	0.0%	20.0%

(1) I = Investment Stage; VC/H = Value Creation/Harvest Stage

(2) FOF = Fund of Funds; D = Direct

(3) Includes recallable distributions.

(4) (Distributed Cash) divided by (Capital Contributions)

(5) (Distributed Cash + Capital Account Balance) divided by (Capital Contributions)

(6) The initial contractual termination date for Apollo Co-Investors VI (A), LLC was 1/12/16. However, as of the Valuation Date, it was expected that Apollo Co-Investors VI (A), LLC would extend one-year and utilize one of its two total possible extensions. Therefore, the Contractual Termination Date was updated to 1/12/2017.

(7) The initial contractual termination date for HAO Capital Fund II LP was 12/5/15. However, as of the Valuation Date, it was expected that HAO Capital Fund II LP would extend one-year and utilize one of its two total possible extensions. Therefore, the Contractual Termination Date was updated to 12/05/2016.

PRIVATE EQUITY INVESTMENTS - SUMMARY OF FAIR MARKET VALUES
BLACK FAMILY PARTNERS, LP
AS OF SEPTEMBER 3, 2015

#	Fund Name	Selected Restriction Period Discount	Capital Account Balance	Less: Selected Restriction Period Discount	Estimated Fair Market Value
. Investment Positions					
1	Apollo Co-Investors IV, LLC	25%	\$391,900	(\$97,975)	\$290,000
2	Apollo Co-Investors V, LLC	25%	\$2,213,581	(\$553,395)	\$1,660,000
3	Apollo Co-Investors VI (A), LLC	15%	\$19,774,934	(\$2,966,240)	\$16,810,000
4	Apollo Credit Opportunities Co-Investors III (A), LP	35%	\$8,207,932	(\$2,872,776)	\$5,340,000
5	HAO Capital Fund II LP	20%	\$4,251,787	(\$850,357)	\$3,400,000
6	Wolfensohn Capital Partners LP	35%	\$1,629,472	(\$570,315)	\$1,060,000
7	Tenfore Holdings Fund I, LP	35%	\$1,010,023	(\$353,508)	\$660,000
Total Fair Market Value of Private Equity Interests					\$29,220,000

CAPITAL MARKET/HEDGE FUNDS - CAPITAL ACCOUNT SUMMARY
BLACK FAMILY PARTNERS, LP
AS OF SEPTEMBER 3, 2015

Valuation Date

9/3/2015

Fund Name	Capital Account Balance	Sidepocket Amount	Unrestricted Capital Amount
Apollo SOMA Co-Investors, LLC	\$2,778,750	\$23,303	\$2,755,447
FCI Co-Investors II (A), LP	\$14,883,721	\$14,883,721	\$0
Athene Holding, Ltd.	\$52,000,000	\$52,000,000	\$0
AP Technology Partners, █.	\$25,579	\$25,579	\$0
AP SHL Investors, LLC	\$0	\$0	\$0
Anchorage Capital Partners	\$18,586,721	\$0	\$18,586,721
Canyon Value Realization Fund	\$19,626,613	\$0	\$19,626,613
King Street Capital	\$1,095,198	\$1,095,198	\$0
Lone Cascade, LP	\$26,973,043	\$0	\$26,973,043
Millennium Group USA	\$28,867,183	\$0	\$28,867,183
Total	\$164,836,808	\$68,027,801	\$96,809,007

CAPITAL MARKET/HEDGE FUNDS - UNRESTRICTED CAPITAL ANALYSIS**BLACK FAMILY PARTNERS, LP****AS OF SEPTEMBER 3, 2015**

	Apollo SOMA Co-Investors, LLC	Anchorage Capital Partners	Canyon Value Realization Fund	Lone Cascade, LP	Millennium Group USA
Capital Account Balance at Valuation Date (Unrestricted)	\$2,778,750	\$18,586,721	\$19,626,613	\$26,973,043	\$28,867,183
Earliest Withdrawal Date	2/28/2016	6/30/2016	12/31/2015	12/31/2015	12/31/2015

PUT OPTION ANALYSIS**INPUT VARIABLES**

Unrestricted Capital Balance (Most Recent Available)	\$2,778,750	\$18,586,721	\$19,626,613	\$26,973,043	\$28,867,183
Exercise Price	\$2,778,750	\$18,586,721	\$19,626,613	\$26,973,043	\$28,867,183
Term (years)	0.49	0.82	0.33	0.33	0.33
Volatility	13.50%	7.50%	7.50%	15.00%	5.00%
Annual Rate of Quarterly Dividends	0.00%	0.00%	0.00%	0.00%	0.00%
Continuously Compounded Risk Free Rate	0.24%	0.36%	0.13%	0.13%	0.13%
Put Option Value	\$102,795	\$477,156	\$331,072	\$915,457	\$322,628
Discount Implied by Black Scholes Model	3.70%	2.57%	1.69%	3.39%	1.12%
Plus: Adjustment for Other Factors	0.75%	1.00%	0.50%	0.50%	0.50%
Estimated Discount Based on Put Analysis	4.40%	3.60%	2.20%	3.90%	1.60%

RESTRICTED STOCK STUDY - QUALITATIVE ANALYSIS

Estimated Discount Based on Qualitative Analysis	6.00%	7.00%	6.00%	6.00%	6.00%
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HOLDING PERIOD SUMMARY ANALYSIS

Selected Liquidity Discount for Holding Period	5.0%	5.0%	4.0%	5.0%	4.0%
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Note: The term for Apollo SOMA Co-Investors, LLC assumes withdrawal at the end of the current month. The agreement provisions for Apollo SOMA Co-Investors, LLC require 90 days notice for withdrawals that are permitted annually on the anniversary date (March 1st) of the investment.

CAPITAL MARKET/HEDGE FUNDS - HOLDING PERIOD DISCOUNT SUMMARY
BLACK FAMILY PARTNERS, LP
AS OF SEPTEMBER 3, 2015

Valuation Date 9/3/2015

Fund Name	Sidepocket Discount %	Unrestricted Capital Discount %	Sidepocket			Primary Tranche			Balance, less Lock-up Period Discount Value (A+B)
			Sidepocket Amount	Less: Lock-up Period Discount	Balance, less Lock-up Period Discount (A)	Unrestricted Capital Amount	Less: Lock-up Period Discount	Balance, less Lock-up Period Discount (B)	
Apollo SOMA Co-Investors, LLC	30%	5.00%	\$23,303	(\$6,991)	\$16,312	\$2,755,447	(\$137,772)	\$2,617,675	\$2,630,000
FCI Co-Investors II (A), LP	30%	0.00%	\$14,883,721	(\$4,465,116)	\$10,418,605	\$0	\$0	\$0	\$10,420,000
Athene Holding, Ltd.	30%	0.00%	\$52,000,000	(\$15,600,000)	\$36,400,000	\$0	\$0	\$0	\$36,400,000
AP Technology Partners, █	30%	0.00%	\$25,579	(\$7,674)	\$17,905	\$0	\$0	\$0	\$18,000
AP SHL Investors, LLC	0%	0.00%	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Anchorage Capital Partners	0%	5.00%	\$0	\$0	\$0	\$18,586,721	(\$929,336)	\$17,657,385	\$17,660,000
Canyon Value Realization Fund	0%	4.00%	\$0	\$0	\$0	\$19,626,613	(\$785,065)	\$18,841,548	\$18,840,000
King Street Capital	30%	0.00%	\$1,095,198	(\$328,559)	\$766,639	\$0	\$0	\$0	\$770,000
Lone Cascade, LP	0%	5.00%	\$0	\$0	\$0	\$26,973,043	(\$1,348,652)	\$25,624,391	\$25,620,000
Millennium Group USA	0%	4.00%	\$0	\$0	\$0	\$28,867,183	(\$1,154,687)	\$27,712,496	\$27,710,000
Total Fair Market Value of Capital Market Fund Investments									\$140,068,000

**APOLLO OPERATING GROUP UNITS
BLACK FAMILY PARTNERS, LP**

AS OF SEPTEMBER 3, 2015

	(Delivered, subject to 144 Volume Restrictions)			March 29 Annual Delivery of AOG Units	
	2013	2014	2015	2016	2017
AOG Units to be delivered	6,954,537	6,954,537	6,954,537	6,954,537	64,909,016
Percent of initial block delivered	7.5%	7.5%	7.5%	7.5%	70.0%
Share Price at Valuation Date	\$19.00	\$19.00	\$19.00	\$19.00	\$19.00
Restricted Value of Delivered Shares	\$132,136,212	\$132,136,212	\$132,136,212	\$132,136,212	\$1,233,271,308
Aggregate AOG Units, Unrestricted Value	\$1,761,816,154				
INPUT VARIABLES					
Unrestricted Block Value	\$132,136,212	\$132,136,212	\$132,136,212	\$132,136,212	\$1,233,271,308
Exercise Price	\$132,136,212	\$132,136,212	\$132,136,212	\$132,136,212	\$1,233,271,308
Estimated Term (years)	0.58	0.58	0.58	0.82	2.08
Volatility	25.00%	25.00%	25.00%	25.00%	30.00%
Annual Rate of Quarterly Dividends	0.00%	0.00%	0.00%	0.00%	0.00%
Continuously Compounded Risk Free Rate	0.24%	0.24%	0.24%	0.30%	0.71%
Discount Implied by Black Scholes Model	7.48%	7.48%	7.48%	8.90%	16.27%
Plus: Adjustment for Other Factors	1.00%	1.00%	1.00%	1.00%	2.00%
Estimated Discount Based on Put Analysis	8.50%	8.50%	8.50%	9.90%	18.30%
Selected Liquidity Discount for Lock-up Period	8.50%	8.50%	8.50%	9.90%	18.30%
AOG Units, Unrestricted Value	\$132,136,212	\$132,136,212	\$132,136,212	\$132,136,212	\$1,233,271,308
Less: Restriction Period Discount	(\$11,231,578)	(\$11,231,578)	(\$11,231,578)	(\$13,081,485)	(\$225,688,649)
AOG Units, Estimated Restriction Adjusted Value	\$120,904,634	\$120,904,634	\$120,904,634	\$119,054,727	\$1,007,582,658
Aggregate AOG Units, Estimated Restriction Adjusted Value	\$1,489,351,286				
Aggregate AOG Units, Estimated Restriction Adjusted Value, rounded	\$1,500,000,000				

APOLLO GLOBAL MANAGEMENT, LLC - VOLATILITY**BLACK FAMILY PARTNERS, LP****AS OF SEPTEMBER 3, 2015**

Company	Ticker	1 yr.	2 yr.	3 yr.	5 yr.	IMPLIED VOLATILITY
Och-Ziff Capital Management	OZM	29.0%	30.4%	29.2%	32.9%	37.7%
Blackstone	BX	26.6%	27.7%	28.9%	34.2%	38.4%
Fortress Investment Group LLC	FIG	31.2%	31.9%	34.0%	40.7%	52.8%
Kohlberg Kravis Roberts & Co.	KKR	25.8%	24.9%	24.1%	32.6%	34.7%
Apollo Global Management	APO	24.4%	27.5%	29.9%	36.1%	32.5%
The Carlyle Group	CG	32.9%	30.5%	30.6%	n/a	37.1%
Oaktree Capital Group, LLC	OAK	20.0%	19.2%	18.9%	n/a	29.7%
Mean		27.1%	27.4%	27.9%	35.3%	37.6%
Median		26.6%	27.7%	29.2%	34.2%	37.1%
Min		20.0%	19.2%	18.9%	32.6%	29.7%
Max		32.9%	31.9%	34.0%	40.7%	52.8%

Selected Volatility for Apollo Global Management, LLC

2017 Tranche	30.0%
2013-2016 Tranches	25.0%

*Volatility data from the Bloomberg Network

Note: Per Apollo Global Management LLC's 6/30/2015 10Q filing, based on APO's historical volatility, management expected annual volatility for equity based compensation of 28.3% for restricted share units and 22.1% for distribution equivalents when estimating the marketability discount for equity based compensation.

APOLLO OPERATING GROUP - TAX RECEIVABLE AGREEMENT **BLACK FAMILY PARTNERS, LP**

AS OF SEPTEMBER 3, 2015

Number of Shares	92,727,166
Price per Share	\$19.00
Value of Block	\$1,761,816,154
Value Attributable to APO Corp.	69.99%
	\$1,233,095,126

Annual Amortization (15 yr.)	\$82,206,342
Effective Tax Rate (Per Management)	40.35%
Discount Rate	12.00%

Year	TRA Amortization	TRA Tax Shield	Days	PV Factor	Present Value of TRA
					Tax Benefit
1	\$82,206,342	\$33,170,259	366	0.89	\$29,607,108
2	\$82,206,342	\$33,170,259	731	0.80	\$26,434,918
3	\$82,206,342	\$33,170,259	1,096	0.71	\$23,602,606
4	\$82,206,342	\$33,170,259	1,461	0.64	\$21,073,755
5	\$82,206,342	\$33,170,259	1,827	0.57	\$18,810,011
6	\$82,206,342	\$33,170,259	2,192	0.51	\$16,794,653
7	\$82,206,342	\$33,170,259	2,557	0.45	\$14,995,226
8	\$82,206,342	\$33,170,259	2,922	0.40	\$13,388,595
9	\$82,206,342	\$33,170,259	3,288	0.36	\$11,950,391
10	\$82,206,342	\$33,170,259	3,653	0.32	\$10,669,992
11	\$82,206,342	\$33,170,259	4,018	0.29	\$9,526,779
12	\$82,206,342	\$33,170,259	4,383	0.26	\$8,506,052
13	\$82,206,342	\$33,170,259	4,749	0.23	\$7,592,332
14	\$82,206,342	\$33,170,259	5,114	0.20	\$6,778,868
15	\$82,206,342	\$33,170,259	5,479	0.18	\$6,052,561
					\$225,783,848
Aggregate Present Value of TRA Tax Benefit, rounded					\$225,780,000
TRA Tax Benefit Sharing Percentage					85%
Net Unrestricted TRA Tax Benefit Available to Block					\$191,913,000
Less: Restriction Period Discount (from Exhibit G-4)					15% (\$28,786,950)
Net Fair Market Value of TRA Tax Benefit Available to Block, rounded					\$163,000,000

APOLLO OPERATING GROUP UNITS
BLACK FAMILY PARTNERS, LP
AS OF SEPTEMBER 3, 2015

Estimated Restricted TRA Value	\$191,913,000
Weighted Average Restriction Period (yrs.)	1.6

INPUT VARIABLES

Unrestricted Block Value	\$191,913,000
Exercise Price	\$191,913,000
Estimated Term (years)	1.6
Volatility	30.00%
Annual Rate of Quarterly Dividends	0.00%
Continuously Compounded Risk Free Rate	0.53%
Put Option Value	\$28,319,334
Discount Implied by Black Scholes Model	14.76%

Selected Restriction Period Discount for TRA Value	15%
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APOLLO OPERATING GROUP - TAX RECEIVABLE AGREEMENT
BLACK FAMILY PARTNERS, LP
AS OF SEPTEMBER 3, 2015

Effective Entity Ownership of Existing TRA **41.68%**
Discount Rate (1) **10.0%**

(\$millions)

Payment for Fiscal Year (2)	Entity Pro Rata Share	Days	PV Factor	Present Value of TRA Tax Benefit
2015	\$0	119	0.97	\$0
2016	\$11,435,945	485	0.88	\$10,075,598
2017	\$18,019,385	850	0.80	\$14,432,649
2018	\$23,079,902	1,215	0.73	\$16,805,342
2019	\$15,824,219	1,580	0.66	\$10,474,734
2020	\$16,672,581	1,946	0.60	\$10,030,382
2021	\$19,113,952	2,311	0.55	\$10,453,758
2022	\$15,117,021	2,676	0.50	\$7,516,150
2023	\$5,194,638	3,041	0.45	\$2,347,966
2024	\$1,785,025	3,407	0.41	\$733,288
2025	\$613,385	3,772	0.37	\$229,071
2026	\$210,777	4,137	0.34	\$71,560
2027	\$72,429	4,502	0.31	\$22,354
2028	\$24,889	4,868	0.28	\$6,982
2029	\$8,552	5,233	0.26	\$2,181
2030	\$2,939	5,598	0.23	\$681
	\$127,175,639			\$83,202,695

Concluded Pro Rata Present Value of Existing TRA Benefit dividends

\$83,000,000

(1) Based on a review of: (i) 15 yr corporate bond yields (BB yield was 7.2% as of the Valuation Date); (ii) Apollo Operating Group's cost of equity; and (iii) asset specific risk factors

(2) Distribution of TRA Dividend received by Black Family Partners by April 15 of the subsequent year. E.g. Fiscal 2014 dividend will be received by April 15, 2015.

BETA CALCULATION**APOLLO GLOBAL MANAGEMENT, LLC****AS OF SEPTEMBER 3, 2015**

Peer Group Data as of

9/3/2015

Company Name	Symbol	Beta*	R ²	Share Price	Shares Outstanding (MM)	MV of Equity (\$MM)	LT Debt (\$MM)	Preferred (\$MM)	MVIC (\$MM)	Tax Rate**	Debt/Equity
Och-Ziff Capital Management	OZM	1.27	35.5%	\$9.93	479.071	\$4,757.2	\$450.4	\$0.0	\$5,207.6	40.2%	9.5%
Blackstone	BX	1.53	53.7%	\$33.48	1,160.628	\$38,857.8	\$2,809.6	\$0.0	\$41,667.5	36.5%	7.2%
Fortress Investment Group LLC	FIG	1.68	46.9%	\$5.64	442.005	\$2,492.9	\$75.0	\$0.0	\$2,567.9	41.1%	3.0%
Apollo Global Management, LLC	APO	1.25	30.0%	\$19.01	397.302	\$7,552.7	\$1,031.3	\$0.0	\$8,584.0	39.7%	13.7%
Kohlberg Kravis Roberts & Co.	KKR	1.41	47.7%	\$18.94	832.694	\$15,771.2	\$2,454.3	\$0.0	\$18,225.5	35.1%	15.6%
The Carlyle Group, LP	CG	1.03	17.0%	\$20.56	322.431	\$6,629.2	\$1,145.6	\$0.0	\$7,774.8	35.3%	17.3%
Oaktree Capital Group, LLC	OAK	0.83	15.1%	\$50.84	154.014	\$7,830.1	\$850.0	\$0.0	\$8,680.1	35.1%	10.9%
Average		1.28	35.1%			\$11,984.4	\$1,259.5	\$0.0	\$13,243.9	37.6%	11.0%
Median		1.27	35.5%			\$7,552.7	\$1,031.3	\$0.0	\$8,584.0	36.5%	10.9%

Unlevered Beta Calculation***

$$B_u = B_d / (1 + ((1 - t)(D/E)))$$

Using Beta, tax rate and the industry's debt to equity ratio, the reported betas are first unlevered below and then relevered in the calculation to the right.

Och-Ziff Capital Management	=	1.20
Blackstone	=	1.47
Fortress Investment Group LLC	=	1.65
Apollo Global Management, LLC	=	1.16
Kohlberg Kravis Roberts & Co.	=	1.28
The Carlyle Group, LP	=	N/A
Oaktree Capital Group, LLC	=	N/A
Overall Average	=	1.35
Overall Median	=	1.28
Selected	=	1.30

Relevered Beta Calculation

B	=	$B_u(1 + ((1 - t)(D/E)))$
B _u	=	1.30
D/E	=	13.7%
t	=	40.4%
B	=	1.41

Industry Debt/Total Capital Calculations

Debt/Total Inv. Capital	12.0%
Equity/Total Inv. Capital	88.0%

Tax Rate Calculation

Combined Tax Rate	40.35%
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Notes:

*Source: Bloomberg Network

**Tax rate for OZM and BX is based on SEC Filing notes indicating that tax distribution are made based on the highest marginal combined tax rate for a New York City, New York resident, approximately 45%.

However, it was further noted that the mix of income derived from foreign versus domestic sources would impact the actual effective tax rate.

***Insufficient trading data for relevant CG and OAK beta calculations.

CAPM SUMMARY**APOLLO GLOBAL MANAGEMENT, LLC****AS OF SEPTEMBER 3, 2015**

The cost of equity capital using the Capital Asset Pricing Model (CAPM) is as follows:

$Re = Rf + (\beta \times (Rm - Rf)) + Rsm$
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Where:

Rf	=	Return on a risk-free asset
β	=	Beta - a measure of the systematic risk of the firm compared to the risk of an investment in a fully diversified stock market portfolio
$Rm - Rf$	=	The market risk premium defined as the expected return required for investing in a fully diversified portfolio (Rm) less the risk-free rate (Rf)
Rsm	=	Small stock premium

We then calculated the Re as follows:

Variable	Value	Source
$Rf =$	2.64%	20-yr treasury bond rate
$Rm - Rf =$	6.00%	Equity Risk Premium
$\beta =$	1.41	Computed Beta, see Page 3
Rsm	1.07%	Duff and Phelps Mid-Cap Company Stock Premium (Deciles 3-5)

$$Re = Rf + (\beta \times (Rm - Rf)) + Rsm$$

$$= 2.64\% + [6.00\% \times 1.41] + 1.07\%$$

$Re = 12.1\%$

**PRICE & HISTORICAL VOLATILITIES OF PUBLICLY TRADED
BUSINESS DEVELOPMENT COMPANIES AND CEICs INVESTED PRIMARILY IN PRIVATE EQUITY
AS OF SEPTEMBER 3, 2015**

#	COMPANY	TICKER	TYPE OF ENTITY (1)	PRICE 09/03/2015 (2)	NAV PER SHARE (2,3)	DISCOUNT/ (PREMIUM) FROM NAV	5-YEAR VOLATILITY (2)
1	Ares Capital Corporation	ARCC	BDC	\$15.51	\$16.80	7.7%	17.4%
2	Apollo Investment Corporation	AINV	BDC	\$6.45	\$8.01	19.5%	25.1%
3	TICC Capital Corp.	TICC	BDC	\$7.00	\$8.60	18.6%	21.9%
4	Gladstone Capital Corp.	GLAD	BDC	\$8.76	\$9.49	7.7%	23.8%
5	American Capital, Ltd.	ACAS	BDC	\$13.70	\$20.35	32.7%	27.6%
6	RENN Global Entrepreneurs Fund, Inc.	RCG	CEIC	\$1.08	\$1.78	39.3%	32.2%
7	MVC Capital, Inc.	MVC	BDC	\$9.31	\$15.86	41.3%	18.1%
8	Capital Southwest Corporation	CSWC	BDC	\$45.00	\$47.17	4.6%	24.7%
AVERAGE						21.4%	23.9%
MEDIAN						19.0%	24.2%
MINIMUM						4.6%	17.4%
MAXIMUM						41.3%	32.2%

¹ "BDC" denotes a business development company, and "CEIC" denotes a closed-end investment company, invested in private equity.

² Source: Bloomberg Network for BDCs; [REDACTED] for CEICs. Closing Prices.

³ Funds 1 through 5 are focused on debt securities, while funds 6 through 9 are focused on equity securities.

⁴ NAVs per share for the BDCs are as the most recent available quarter. NAVs per share for the CEICs are as of the Valuation Date.

PRICE & DIVIDEND YIELDS FOR PUBLICLY-TRADED CLOSED END FUNDS
PRIMARILY INVESTED IN CAPITAL APPRECIATION SECURITIES
AS OF SEPTEMBER 3, 2015

#	COMPANY ¹	TICKER	PRICE 09/03/15	NAV PER SHARE ³	DISCOUNT FROM NAV ³	LTM DIVIDEND INCOME ²	LTM INCOME YIELD	5-YEAR VOLATILITY ³
1	Adams Express	ADX	\$13.04	\$15.24	14.4%	0.17	1.3%	15.6%
2	Eagle Capital Growth	GRF	\$7.76	\$8.76	11.4%	0.00	0.0%	24.5%
3	Gabelli Equity Trust	GAB	\$5.56	\$6.01	7.5%	0.03	0.6%	19.0%
4	General American Investors	GAM	\$31.88	\$38.23	16.6%	0.03	0.1%	15.9%
5	Nuveen Core Equity Alpha	JCE	\$15.47	\$16.57	6.6%	0.17	1.1%	16.0%
6	Source Capital Inc	SOR	\$71.00	\$75.05	5.4%	0.15	0.2%	17.5%
7	Tri-Continental Corporation	TY	\$19.93	\$23.59	15.5%	0.80	4.0%	13.8%
8	Zweig Fund	ZF	\$13.21	\$15.25	13.4%	0.11	0.8%	14.9%
9	Zweig Total Return	ZTR	\$11.86	\$13.85	14.4%	0.22	1.9%	10.0%
AVERAGE					11.7%		1.1%	16.3%
MEDIAN					13.4%		0.8%	15.9%
MINIMUM					5.4%		0.0%	10.0%
MAXIMUM					16.6%		4.0%	24.5%

¹Sample was created using funds listed in *Barron's*.

²Information from [REDACTED]

³Information from Bloomberg, closing prices.

**PRICE & DIVIDEND YIELDS FOR PUBLICLY-TRADED CLOSED END FUNDS
INVESTED PRIMARILY IN GOVERNMENT BONDS AND SECURITIES
AS OF SEPTEMBER 3, 2015**

#	COMPANY ¹	TICKER	PRICE 09/03/15	NAV PER SHARE ³	DISCOUNT FROM NAV ³	LTM DIVIDEND INCOME ²	LTM INCOME YIELD	5-YEAR VOLATILITY ³
1	AllianceBernstein Income Fund	ACG	\$7.92	\$8.23	3.8%	\$0.38	4.8%	8.1%
2	BlackRock Enhanced Gov Fund	EGF	\$13.62	\$14.52	6.2%	\$0.42	3.0%	5.5%
3	BlackRock Income Trust	BKT	\$6.32	\$7.09	10.9%	\$0.31	5.0%	6.9%
4	Federated Enhanced Treasury In	FTT	\$13.45	\$13.86	3.0%	\$0.13	1.0%	7.2%
					AVERAGE		3.5%	6.9%
					MEDIAN		3.9%	7.1%
					MINIMUM		1.0%	5.5%
					MAXIMUM		5.0%	8.1%

¹Sample was created using funds listed in *Barron's*.

²Information from [REDACTED]

³Information from Bloomberg, closing prices.

QUANTITATIVE FINANCIAL RISK ANALYSIS**BLACK FAMILY PARTNERS, LP****AS OF SEPTEMBER 3, 2015****MEASURES OF COMPANY SIZE****A. Revenue**

	Revenue (\$MM)			Discount			
	Low	High	Average	Low	High	Average	Median
Top Quintile	\$50.1	\$7,859.1	\$360.2	0.0%	55.0%	18.3%	14.7%
Second Quintile	\$12.8	\$49.9	\$26.5	0.0%	84.6%	20.6%	14.5%
Third Quintile	\$4.4	\$12.6	\$8.6	0.0%	59.2%	20.9%	18.3%
Fourth Quintile	\$0.6	\$4.4	\$2.3	0.0%	70.0%	28.1%	25.7%
Bottom Quintile	\$0.0	\$0.6	\$0.1	0.0%	80.8%	26.5%	24.1%

B. Market Value of Equity

	Market Value (\$MM)			Discount			
	Low	High	Average	Low	High	Average	Median
Top Quintile	\$190.5	\$5,726.1	\$664.7	0.0%	65.8%	17.6%	12.8%
Second Quintile	\$98.1	\$184.7	\$132.6	0.0%	56.8%	16.9%	12.8%
Third Quintile	\$50.2	\$98.0	\$76.2	2.3%	84.6%	25.8%	24.1%
Fourth Quintile	\$25.1	\$50.0	\$34.5	0.0%	80.8%	29.1%	27.3%
Bottom Quintile	\$2.0	\$24.4	\$14.1	0.0%	59.2%	24.9%	22.8%

C. Book Value of Equity

	Book Value (\$MM)			Discount			
	Low	High	Average	Low	High	Average	Median
Top Quintile	\$39.6	\$789.4	\$162.0	0.0%	65.8%	15.0%	11.2%
Second Quintile	\$14.2	\$39.6	\$26.4	0.0%	84.6%	18.4%	14.8%
Third Quintile	\$5.5	\$14.2	\$8.5	0.0%	70.0%	25.7%	24.7%
Fourth Quintile	\$1.6	\$5.4	\$3.1	0.0%	57.9%	25.7%	26.1%
Bottom Quintile	(\$76.2)	\$1.6	(\$2.6)	0.0%	80.8%	29.6%	26.0%

D. Book Value of Total Assets

	Total Assets (\$MM)			Discount			
	Low	High	Average	Low	High	Average	Median
Top Quintile	\$79.2	\$12,471.4	\$1,027.8	0.0%	84.6%	16.7%	13.2%
Second Quintile	\$29.6	\$78.5	\$50.6	0.0%	65.8%	17.2%	12.8%
Third Quintile	\$10.7	\$28.8	\$17.6	0.0%	56.7%	21.4%	19.6%
Fourth Quintile	\$4.4	\$10.5	\$7.4	0.0%	70.0%	27.2%	26.5%
Bottom Quintile	\$0.0	\$4.4	\$2.4	0.0%	80.8%	31.8%	30.6%

QUANTITATIVE FINANCIAL RISK ANALYSIS

BLACK FAMILY PARTNERS, LP

AS OF SEPTEMBER 3, 2015

MEASURES OF RISK & PROFITABILITY

A. EQUITY VOLATILITY ^{1,2,3}

	Volatility			Discount			
	Low	High	Average	Low	High	Average	Median
Top Quintile	115.2%	2024.7%	208.5%	0.0%	80.8%	34.9%	32.8%
Second Quintile	86.1%	114.2%	100.7%	0.0%	55.6%	25.3%	24.7%
Third Quintile	73.0%	86.0%	78.8%	0.0%	64.2%	20.3%	17.5%
Fourth Quintile	55.9%	73.0%	64.6%	0.0%	53.2%	17.9%	15.0%
Bottom Quintile	19.0%	55.7%	42.4%	0.0%	84.6%	15.4%	13.1%

B. NET PROFIT MARGIN

	Net Profit Margin			Discount			
	Low	High	Count	Low	High	Average	Median
Margin > 0%	0.1%	66.9%	91	0.0%	84.6%	19.4%	14.5%
Margin < 0%	-58225.0%	-0.1%	229	0.0%	80.8%	24.6%	22.6%
No Data Reported	N/A	N/A	25	N/A	N/A	N/A	N/A

C. DIVIDENDS

	Dividend Yield			Discount			
	Median	Average	Count	Low	High	Average	Median
Dividend Paying	3.5%	5.0%	26	0.0%	38.0%	13.2%	13.1%
Non-Dividend Paying	N/A	N/A	319	0.0%	84.6%	23.7%	20.9%

Notes:

¹ Volatility is defined as the annualized standard deviation of the continuously compounded rate of return on the company's common stock. **The standard deviation was calculated using the change in weekly closing prices over the one-year period prior to the transaction date.**

² Includes 337 transactions. Volatility was not reported with 8 transactions.

³ Implied discounts are positively correlated with volatility, and negatively correlated with size metrics.

ESTIMATED RESTRICTED STOCK EQUIVALENT DISCOUNT
BLACK FAMILY PARTNERS, LP
AS OF SEPTEMBER 3, 2015

BASED ON QUANTITATIVE FINANCIAL RISK ANALYSIS

Metric	Exhibit	Company Measure	Implied Quintile	Median Discount	Weighting	Weighted Average
Sized Metrics						
Revenue (\$MM)	EXHIBIT J-1	-\$1.02	Bottom Quintile	24.1%	0.00%	0.0%
Market Value of Equity (\$MM)	EXHIBIT J-1	\$2,004.12	Top Quintile	12.8%	33.33%	4.3%
Book Value of Equity (\$MM)	EXHIBIT J-1	\$2,056.46	Top Quintile	11.2%	0.00%	0.0%
Total Assets (\$MM)	EXHIBIT J-1	\$2,056.46	Top Quintile	13.2%	0.00%	0.0%
Other Metrics						
Equity Volatility (%)	EXHIBIT J-2	30.0%	Bottom Quintile	13.1%	33.33%	4.4%
Profitable (Based on Net Profit Margin) ¹	EXHIBIT J-2	N	N/A	22.6%	0.00%	0.0%
Dividend-Paying ¹	EXHIBIT J-2	Y	N/A	13.1%	33.33%	4.4%
ESTIMATED RESTRICTED STOCK EQUIVALENT DISCOUNT (TO EXHIBIT J-4)					100.0%	13.0%

Notes:

¹ Y = Yes; N = No

**ESTIMATED PRIVATE COMPANY DISCOUNT INCREMENT
BLACK FAMILY PARTNERS, LP**
AS OF SEPTEMBER 3, 2015
BASED ON BLOCK SIZE ILLIQUIDITY ANALYSIS

	% Shares Place			Discount			
	Low	High	Count	Low	High	Average	Median
More than 40%	40.4%	48.0%	5	10.6%	62.3%	42.1%	42.3%
More than 35%	39.3%	48.0%	6	0.0%	62.3%	35.0%	40.4%
More than 30%	30.4%	48.0%	12	0.0%	72.4%	40.9%	41.6%
More than 25%	25.0%	48.0%	23	0.0%	72.4%	33.8%	38.5%
More than 20%	20.2%	48.0%	52	0.0%	91.3%	30.2%	25.5%
20% or Less	0.10%	19.8%	345	0.0%	84.6%	22.9%	20.0%

Summary

	Low	Mid	High
Range of Median Discounts for Blocks > 20%	25.5%	33.9%	42.3%
Divided by Median for Blocks < 20%	20.0%	20.0%	20.0%
Multiplicative Adjustment Factors for Private Company Discount Increment ¹	1.27	1.69	2.12
Times: Estimated Restricted Stock Equivalent (see EXHIBIT J-3)	13.0%	13.0%	13.0%
Implied Range of Private Company Discounts ²	16.5%	22.0%	27.4%
Blocks > 20%, excluding blocks with registration rights			
Implied Reasonable Range of Discounts for Lack of Marketability	17.0%		27.0%

Notes:
¹ Equal to min or max median discount for block sizes > than 20% divided by median discount for block sizes < 20%.

² Equal to multiplicative adjustment factor times the restricted stock equivalent.