

Trugman Valuation Associates (TVA) Restricted Stock Study—An Update

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This article is an update to the first Trugman Valuation Associates (TVA) restricted stock study published in the fall 2009 issue of Business Valuation Review. The impact of the changes to the Rule 144 holding period on implied restricted stock discounts is also examined.

Introduction

In the fall 2009 issue of *Business Valuation Review*, the first edition of the Trugman Valuation Associates, Inc. (TVA), restricted stock study was published, which covered the years 2007 and 2008. The study was prepared with two goals in mind: to analyze the impact of the economic recession on implied restricted stock discounts and to analyze the statistical relationships between implied restricted stock discounts and various company-specific variables. The study included 80 transactions involving sales of restricted stock that took place during 2007 and 2008. The average and median implied discounts for these 80 transactions were 18.1% and 14.4%, respectively.

About halfway through the time period covered by the first edition of the TVA restricted stock study, the landscape for the restricted stock market changed. On 15 November 2007, it was announced that the required holding period under Rule 144 would be reduced from one year to six months beginning in February 2008. The first edition of the TVA restricted stock study included some transactions that took place after the changes to the Rule 144 holding period; however, the extreme level of volatility and uncertainty in the public markets over the 2007 to 2008 time frame made it difficult to truly analyze the impact of the reduction in the required Rule 144 period on implied restricted stock discounts.

Fast forward to 2011. The shortened holding period has now been in effect for over three years. This has allowed

us to collect enough data to perform a better analysis of the impact that the changes to the Rule 144 holding period have had on implied restricted stock discounts. The transactions analyzed in this study were discovered by searching through 8-K filings of public companies from the 10K Wizard database and the full text search database provided on the SEC's website. We applied the same search criteria in this study as we did in the first TVA restricted stock study.

After our search process was completed, we determined that 56 additional transactions met our criteria in addition to the original 80 transactions from our first study. This gave us a total of 136 transactions to work with. Out of the total 136 transactions, 89 took place after the rule change, while 47 transactions took place before. Details of all of the transactions appear in Table 1.

The 136 transactions in total had an average implied discount of 16.6%, a median of 14.3%, and a standard deviation of 14.9%. For the 47 transactions that took place before the rule change, the average and median discounts were 17.9% and 14.8%, respectively. For the 89 transactions that took place after the rule change, the average and median discounts were 15.9% and 14.3%, respectively. A brief statistical summary of the data before and after the rule change is presented in Table 2.

In an attempt to better understand the data and the factors that drive implied restricted stock discounts, we updated the correlation and quartile analyses that were performed in the first study. These analyses were performed to see if the addition of the new data changes any of the conclusions reached in the first study.

Correlation Analysis

The updated correlation coefficients and R^2 statistics are presented in Table 3. In reviewing these statistics, it becomes apparent that volatility still remains the only variable that has a notable statistical relationship with the

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Table 1
Unregistered Stock Sales

Company	Ticker	Date of Transaction	Exchange	Price Per Share (\$)	Shares Placed	Offering Amount (\$)	Discount Announced in Filing (%)	Discount (%)	Average Stock Price Transaction Month (\$)	Discount (%)
Atlas Mining Co	ALMI	1/10/2007	OTC BB	1.35	1,481,482	2,000,001	N/A	N/A	1.62	16.7
Singing Machine Co	SMD	1/16/2007	AMEX	0.83	1,800,024	1,500,000	N/A	N/A	1.15	27.5
Avalon Pharmaceuticals	AVRX	1/19/2007	NASDAQ	3.34	3,000,000	10,020,000	N/A	N/A	3.58	6.7
Ricks Cabaret International	RICK	2/1/2007	NASDAQ	7.00	425,000	2,975,000	N/A	N/A	9.72	27.9
VCG Holding Corp	VCGH	2/2/2007	NASDAQ	7.10	3,000,000	21,300,000	N/A	N/A	10.08	29.5
Black Hills Corp	BKH	2/14/2007	NYSE	36.00	4,170,891	150,152,076	N/A	N/A	37.59	4.2
Triangle Petroleum Corp	TPLM	2/26/2007	OTC BB	2.00	10,412,000	20,824,000	N/A	N/A	2.77	27.8
Euronet Worldwide	EEFT	3/8/2007	NASDAQ	25.00	6,374,528	159,363,200	N/A	N/A	26.59	6.0
Granite City Food and Brewery	GCFB	3/8/2007	NASDAQ	5.35	2,617,334	14,002,737	N/A	N/A	5.99	10.7
Ethos Environmental	ETEV	3/9/2007	OTC BB	1.00	50,000	50,000	N/A	N/A	3.78	73.5
Colombia Goldfields	CGDF	3/21/2007	OTC BB	1.00	9,020,000	9,020,000	N/A	N/A	1.21	17.0
Transmeridian Exploration	TMYEQ	4/1/2007	OTC BB	2.70	1,655,000	4,468,500	N/A	N/A	2.93	7.7
Ricks Cabaret International	RICK	4/2/2007	NASDAQ	9.40	425,000	3,995,000	N/A	N/A	9.27	-1.5
AFP Imaging Corp	AFPC	4/13/2007	OTC BB	1.48	5,500,000	8,140,000	N/A	N/A	1.90	21.9
Oilsands Quest	BQI	5/3/2007	AMEX	2.75	13,900,000	38,225,000	N/A	N/A	3.11	11.6
BPZ Resources	BPZ	5/8/2007	AMEX	5.25	6,700,000	35,175,000	N/A	N/A	6.30	16.6
AtriCure Inc.	ATRC	5/24/2007	NASDAQ	9.15	1,683,060	15,399,999	N/A	N/A	10.63	13.9
Synutra International	SYUT	5/29/2007	NASDAQ	16.50	4,000,000	66,000,000	N/A	N/A	18.75	12.0
Neogenomics Inc.	NGNM	6/1/2007	OTC BB	1.50	2,670,000	4,005,000	N/A	N/A	1.68	10.7
3D Systems Corp	TDSC	6/19/2007	NASDAQ	17.50	1,250,000	21,875,000	N/A	N/A	22.68	22.8
Metalico Inc.	MEA	6/21/2007	AMEX	7.00	5,246,000	36,722,000	N/A	N/A	7.48	6.4
VIA Pharmaceuticals	VIAP	6/29/2007	NASDAQ	2.43	10,288,065	24,999,998	38.50	38.50	1.09	54.1
Mandalay Media Inc.	MNDL	7/24/2007	OTC BB	0.50	5,000,000	2,500,000	N/A	N/A	6.25	14.3
Enova Systems	ENA	7/25/2007	AMEX	5.35	2,218,000	11,866,300	N/A	N/A	10.04	0.4
Sport Supply Group	RBI	7/26/2007	NASDAQ	10.00	1,830,000	18,300,000	N/A	N/A	5.50	18.2
Progressive Gaming Corp	PGIC	8/13/2007	NASDAQ	4.50	6,943,333	31,244,999	N/A	N/A	4.25	17.6
Transworld Corp	TWOC	8/22/2007	OTC BB	3.50	1,000,000	3,500,000	N/A	N/A	2.11	9.7
Meade Instruments	MEAD	8/24/2007	NASDAQ	1.90	3,157,895	6,000,001	N/A	N/A	2.11	9.7
Profile Technologies	PRTK	8/24/2007	OTC BB	0.90	436,111	392,500	N/A	N/A	1.50	40.0
Manitex Corporation	MNTX	8/30/2007	NASDAQ	6.00	1,500,000	9,000,000	N/A	N/A	7.23	17.0
Asian Dragon Group	AADG	8/31/2007	OTC BB	2.16	600,000	1,294,860	N/A	N/A	3.85	43.9
Live Current Media	LIVC	9/25/2007	OTC BB	2.00	2,550,000	5,100,000	N/A	N/A	2.24	10.5
Big Cat Energy Corp	BCTE	10/2/2007	OTC BB	1.00	500,000	500,000	N/A	N/A	1.42	29.3
HOGS	HOGS	10/9/2007	NASDAQ	8.00	6,250,000	50,000,000	N/A	N/A	12.05	33.6
Viper Powersports	VPWS	10/12/2007	OTC BB	0.75	1,338,667	1,004,000	N/A	N/A	1.00	25.0
USA Technologies Inc.	USAT	10/17/2007	NASDAQ	7.00	2,142,871	15,000,097	N/A	N/A	7.80	10.3
Ivivi Technologies	IVVI	10/18/2007	NASDAQ	5.00	1,000,000	5,000,000	N/A	N/A	5.14	2.6
Optimer Pharmaceuticals	OPTR	10/23/2007	NASDAQ	7.80	4,600,000	35,880,000	N/A	N/A	8.11	3.8
Elixir Gaming Technologies	EGT	10/25/2007	AMEX	3.50	15,000,000	52,500,000	N/A	N/A	4.55	23.0
Sequenom Inc.	SQNM	10/26/2007	NASDAQ	9.00	3,383,335	30,450,015	N/A	N/A	9.32	3.4
Fushi Copperweld	FSIN	10/26/2007	NASDAQ	14.00	2,786,000	39,004,000	N/A	N/A	15.85	11.7

Table 1
Continued

Company	Ticker	Date of Transaction	Exchange	Price Per Share (\$)	Shares Placed	Offering Amount (\$)	Discount Announced in Filing (%)	Discount (%)	Average Stock Price Transaction Month (\$)	Discount (%)
Sten Corp	STEN	10/30/2007	NASDAQ	2.50	310,000	525,000	N/A	N/A	2.81	10.9
Cano Petroleum	CFW	11/2/2007	AMEX	7.15	3,500,000	25,025,000	N/A	N/A	7.48	4.3
Kona Grill	KONA	11/6/2007	NASDAQ	16.25	650,000	10,562,500	N/A	N/A	16.72	2.8
China Bak Battery	CBAK	11/6/2007	NASDAQ	3.90	3,500,000	13,650,000	N/A	N/A	4.65	16.0
EPIX Pharmaceuticals	EPIX	11/9/2007	NASDAQ	3.10	5,245,468	16,260,951	15	15	4.65	15.0
Green Plains Renewable Energy	GPRED	11/14/2007	NASDAQ	8.10	1,200,000	9,720,000	N/A	N/A	9.51	14.8
Ricks Cabaret International	RICK	11/19/2007	NASDAQ	14.00	1,165,000	16,310,000	N/A	N/A	16.05	12.7
General Moly Inc.	GMO	11/20/2007	AMEX	8.50	8,256,699	70,181,942	N/A	N/A	9.54	10.9
Pressure Biosciences	PBIO	11/21/2007	OTC BB	5.00	126,750	633,750	N/A	N/A	6.59	24.1
Gold Resource Corp	GORO	12/5/2007	OTC BB	4.00	5,413,500	21,654,000	N/A	N/A	4.25	5.9
Wonder Auto Technology	WATG	12/10/2007	NASDAQ	8.65	3,000,000	25,950,000	N/A	N/A	10.09	14.3
Legend International	LGDI	12/12/2007	OTC BB	0.80	18,750,000	15,000,000	N/A	N/A	1.05	23.8
Cougar Biotechnology	CGRB	12/14/2007	NASDAQ	29.00	3,000,000	87,000,000	N/A	N/A	31.25	7.2
AspenBio	APPY	12/20/2007	NASDAQ	7.25	2,516,310	18,243,250	N/A	N/A	9.97	27.2
National Coal Corp	NCOC	12/27/2007	NASDAQ	3.91	1,000,000	3,910,000	15.0	15.0		15.0
National Coal Corp	NCOC	12/27/2007	NASDAQ	4.10	1,000,000	4,100,000	15.0	15.0		15.0
Tri-Valley Corporation	TIV	1/00/2008	AMEX	5.00	210,000	1,050,000	N/A	N/A	6.30	20.6
Biospecifics Technology	BSTC	1/14/2008	OTC BB	10.50	200,000	2,100,000	N/A	N/A	12.25	14.3
En2go International	ENGO	1/22/2008	OTC BB	1.00	1,350,000	1,350,000	N/A	N/A	2.10	52.4
Delta Petroleum Corp	DPTR	2/20/2008	NASDAQ	19.00	36,000,000	684,000,000	N/A	N/A	20.83	8.8
Hoku Scientific	HOKU	2/29/2008	NASDAQ	8.64	2,893,519	25,000,000	N/A	N/A	9.70	10.9
RCM Technologies	RCMT	3/19/2008	NASDAQ	4.29	700,000	3,000,000	N/A	N/A	4.72	9.2
Enova Systems Inc.	ENA	3/26/2008	AMEX	3.91	2,131,274	8,333,281	N/A	N/A	3.95	1.0
Secured Digital Storage Corp	SDGS	4/22/2008	OTC BB	0.80	2,681,375	2,145,100	N/A	N/A	2.73	70.6
Widepoint Corporation	WYY	5/12/2008	AMEX	1.02	2,500,000	2,550,000	N/A	N/A	1.23	16.7
National Coal Corp	NCOC	5/12/2008	NASDAQ	4.65	2,332,000	10,843,800	7.4	7.4		7.4
Asia Premium Television Group	ATVG	5/22/2008	OTC BB	2.00	385,000	770,000	N/A	N/A	2.88	30.4
Oilsands Quest	BQI	5/23/2008	AMEX	4.20	12,976,761	54,502,396	N/A	N/A	4.47	6.0
Oilsands Quest	BQI	5/23/2008	AMEX	4.20	11,904,761	49,999,996	N/A	N/A	4.47	6.0
Graymark Healthcare	GRMH	6/3/2008	NASDAQ	4.50	3,344,447	15,050,012	N/A	N/A	7.90	43.0
ICO Global Communications	ICOG	6/6/2008	NASDAQ	3.61	6,515,697	23,500,000	5	5		5.0
Ricks Cabaret International	RICK	6/12/2008	NASDAQ	20.00	672,000	13,440,000	N/A	N/A	20.45	2.2
Harbin Electric	HRBN	6/24/2008	NASDAQ	14.13	3,500,000	49,455,000	N/A	N/A	16.52	14.4
Document Security Systems Inc.	DMC	6/25/2008	AMEX	4.00	500,000	2,000,000	N/A	N/A	5.30	24.5
Argan, Inc.	AGX	7/2/2008	AMEX	12.00	2,200,000	26,400,000	N/A	N/A	15.97	24.9
Tercica Inc.	TRCA	7/11/2008	NASDAQ	6.77	590,580	3,999,998	N/A	N/A	8.89	23.8
L-1 Identity Solutions	ID	8/5/2008	NYSE	14.85	8,083,472	120,000,000	N/A	N/A	14.93	0.5
Profile Technologies Inc.	PRTK	8/15/2008	OTC BB	0.90	2,550,440	2,295,404	N/A	N/A	2.40	62.5
Odyssey Marine Exploration	OMEX	8/19/2008	NASDAQ	4.90	1,970,000	9,653,000	N/A	N/A	4.85	-1.0
BPZ Resources	BPZ	2/23/2009	NYSE	3.05	14,300,000	43,615,000	N/A	N/A	4.63	34.1
Bryn Mawr Bank Corp	BMTC	4/21/2009	NASDAQ	16.66	150,061	2,500,016	0	0		0.0
American DG Energy	ADGE	4/23/2009	AMEX	2.10	1,076,190	2,259,999	N/A	N/A	2.65	20.8
Southeastern Bank Financial Corp	SBFC	5/14/2009	OTC BB	13.25	683,272	9,053,354	N/A	N/A	14.28	7.2
Odyssey Marine Exploration	OMEX	5/22/2009	NASDAQ	2.97	1,720,000	5,099,800	N/A	N/A	3.55	16.4

Table 1
Continued

Company	Ticker	Date of Transaction	Exchange	Price Per Share (\$)	Shares Placed	Offering Amount (\$)	Discount Announced in Filing (%)	Discount (%)	Average Stock Price Month (\$)	Discount (%)
Macatava Bank Corp	MBCB	6/5/2009	NASDAQ	3.20	312,500	1,000,000	N/A	N/A	3.44	7.0
Superior Bancorp	SUPR	7/15/2009	NASDAQ	2.18	1,700,000	3,700,000	N	N	2.98	26.8
Neogenomics Inc.	NGNM	7/24/2009	OTC BB	1.36	3,500,000	4,767,000	N	N	1.79	23.7
Heartware International	HTWR	8/10/2009	NASDAQ	22.00	2,500,000	55,000,000	N	N	24.79	11.3
Sierra Bancorp	BSRR	8/27/2009	NASDAQ	11.00	1,935,000	21,285,000	N	N	13.37	17.7
Rand Capital	RAND	9/1/2009	NASDAQ	3.42	741,602	2,536,279	N	N	3.56	3.9
Hanmi Financial	HAFC	9/4/2009	NASDAQ	1.37	5,070,423	6,946,480	N	N	1.67	18.0
Ibio, Inc.	IBPM	9/10/2009	OTC BB	0.65	4,615,385	3,000,000	N	N	1.10	40.9
Solar Power Inc.	SOPWE	9/23/2009	OTC BB	1.00	12,077,000	12,077,000	N	N	1.46	31.3
KeyOn Communications	KEYO	10/27/2009	OTC BB	1.50	626,667	940,001	N	N	2.12	29.2
Tri Valley Corp	TIV	11/1/2009	AMEX	1.00	450,000	450,000	N	N	2.33	57.0
Gulf Resources	GFRE	12/11/2009	NASDAQ	8.50	2,941,181	25,000,039	N	N	10.58	19.6
Oilsands Quest	BQI	12/16/2009	AMEX	1.05	8,571,443	9,000,015	N	N	1.18	10.6
inContact Inc.	SAAS	12/21/2009	NASDAQ	2.45	3,428,571	8,399,999	N	N	2.65	7.4
Saia Inc.	SAIA	12/22/2009	NASDAQ	11.50	2,182,609	25,100,004	N	N	14.60	21.2
Hughes Telematics	HUTC	12/28/2009	OTC BB	3.00	2,516,667	7,550,001	N	N	4.46	32.7
Vermillion Inc.	VRML	1/7/2010	NASDAQ	18.49	2,327,869	43,049,747	N	N	24.18	23.5
Tearlab Corp	TEAR	1/11/2010	NASDAQ	0.92	1,886,291	1,743,989	Y	20	20.17	20.0
Meta Financial Group	CASH	1/26/2010	NASDAQ	21.33	265,000	5,652,450	N	N/A	20.17	-5.8
Meta Financial Group	CASH	1/29/2010	NASDAQ	21.40	150,000	3,210,000	N	N/A	20.17	-6.1
Cedar Shopping Centers Inc.	CDR	2/5/2010	NYSE	6.60	1,250,000	8,250,000	N	N/A	7.10	7.0
Prolor Biotech, Inc.	PBTH	3/17/2010	AMEX	2.35	10,382,975	24,399,991	N	N/A	3.71	36.6
Colony Bancorp	CBAN	3/30/2010	NASDAQ	4.11	1,216,545	5,000,000	Y	0		0.0
Appliance Recycling Stores of America	ARCI	4/1/2010	NASDAQ	2.00	915,000	1,830,000	N	N/A	3.18	37.0
Vist Financial Corp	VIST	4/21/2010	NASDAQ	8.00	644,000	5,152,000	N	N/A	9.00	11.1
Metrocorp Bancshares	MCBI	4/23/2010	NASDAQ	3.23	1,250,000	4,037,500	Y	-10		-10.0
Sequenom Inc.	SQNM	5/12/2010	NASDAQ	4.15	12,435,000	51,605,250	N	N/A	5.60	25.8
Boston Private Financial Holdings	BPFH	6/1/2010	NASDAQ	5.81	1,084,450	6,300,004	N	N/A	6.55	11.3
CAS Medical Systems, Inc.	CASM	6/16/2010	NASDAQ	1.40	1,375,000	1,925,000	N	N/A	1.56	10.0
Gladstone Commercial	GOOD	7/8/2010	NASDAQ	15.00	4,227	63,405	N	N/A	14.34	-4.6
Gladstone Commercial	GOOD	7/23/2010	NASDAQ	15.00	4,000	60,000	N	N/A	14.34	-4.6
Brigus Gold Corp	BRD	7/29/2010	NASDAQ	1.29	10,000,000	12,943,400	N	N/A	1.18	-10.2
Gladstone Commercial	GOOD	8/10/2010	NASDAQ	15.00	6,667	100,000	N	N/A	16.46	8.9
Gladstone Commercial	GOOD	8/26/2010	NASDAQ	15.00	7,000	105,000	N	N/A	16.46	8.9
MBT Financial Corp	MBTF	9/1/2010	NASDAQ	1.39	842,038	1,171,831	N	N/A	1.63	14.4
Westwood One	WWON	9/7/2010	NASDAQ	6.50	769,231	5,000,002	N	N/A	7.33	11.3
Gold Resource Corp	GORO	9/19/2010	AMEX	16.00	3,475,000	55,600,000	N	N/A	17.39	8.0
Green Mountain Coffee Roasters	GMCR	9/28/2010	NASDAQ	29.18	8,566,649	250,000,004	N	N/A	34.26	14.8
Gladstone Commercial	GOOD	9/29/2010	NASDAQ	15.00	27,667	415,000	N	N/A	16.88	11.1
National Penn Bancshares	NPBC	10/5/2010	NASDAQ	6.05	10,462,810	63,300,001	N	N/A	6.42	5.8
Gladstone Commercial	GOOD	10/12/2010	NASDAQ	15.00	7,156	107,342	N	N/A	18.25	17.8
Pure Bioscience	PURE	10/22/2010	NASDAQ	2.20	1,080,000	2,376,000	N	N/A	2.65	17.0
Aveo Pharmaceuticals	AVEO	10/28/2010	NASDAQ	13.50	4,500,000	60,750,000	N	N/A	13.75	1.8
THT Heat Transfer Tech	THTI	11/2/2010	NASDAQ	3.20	4,453,500	14,251,200	N	N/A	3.88	17.5

Table 1
Continued

Company	Ticker	Date of Transaction	Exchange	Price Per Share (\$)	Shares Placed	Offering Amount (\$)	Discount Announced in Filing (%)	Average Stock Price Transaction Month (\$)	Discount (%)
Hyperdynamics Corp	HDY	11/3/2010	AMEX	2.00	15,000,000	30,000,000	N/A	2.84	29.5
CC Media Holdings	CCMO	11/15/2010	NASDAQ	7.08	706,215	5,000,002	N/A	7.83	9.5
Bridge Capital Holdings	BBNK	11/18/2010	NASDAQ	8.55	3,508,771	29,999,992	N/A	8.63	0.9
Theravance	THRX	11/29/2010	NASDAQ	22.50	5,750,000	129,375,000	N/A	22.66	0.7
Solar Capital, Ltd.	SLRC	11/30/2010	NASDAQ	22.94	1,050,000	24,087,000	N/A	23.09	0.6
China Executive Education	CECX	12/2/2010	OTC BB	2.50	73,900	184,750	N/A	3.54	29.4
Synergy Resources	SYRG	12/23/2010	OTC BB	2.00	6,502,000	13,004,000	N/A	2.55	21.6
Average									16.6
1st Quartile									7.0
Median									14.3
3rd Quartile									23.8
High									73.5
Low									-10.2
Standard Deviation									14.93
Number of Transactions									136

Table 2
Pre-Rule Change vs. Post-Rule Change

	Pre-Rule Change	Post-Rule Change
Average (%)	17.9	15.9
Median (%)	14.8	14.2
Standard Deviation (%)	14.6	15.1
Number of Transactions	47	89

implied discounts. However, despite the weak statistical relationships, the correlation coefficients for each of the variables are consistent with economic theory. The price volatility, shares placed per average volume, debt ratio, exchange, and days until registration variables all had positive correlation coefficients, which indicate that the implied discounts tend to increase when these variables increase. On the other hand, all size, volume, and profitability metrics had negative correlation coefficients, indicating that discounts tend to be higher for smaller, thinly traded, and less profitable companies. Nevertheless, the linear relationships between implied restricted stock discounts and all of the variables analyzed, with the exception of volatility, are not strong enough to derive any meaningful conclusions.

Quartile Analysis

We also performed an update to the quartile analysis that was presented in the first study. First, we divided the data into four quartiles based on each variable. Each quartile contained a total of 34 transactions. A summary of this analysis is presented in Table 4.

In analyzing the data in Table 4, it becomes apparent that the only variables for which the average and median implied discounts change as expected across all four

Table 3
Correlation Analysis

	Correlation	R ²
Volatility	0.70	0.49
Debt Ratio	0.15	0.02
Exchange	0.47	0.22
Volume	(0.08)	0.01
Shares Placed Per Average Volume	0.40	0.16
Share Turnover	(0.11)	0.01
Market Cap	(0.17)	0.03
Revenues	(0.09)	0.01
Total Assets	(0.16)	0.02
Book Value	(0.04)	0.00
Positive Net Income	(0.17)	0.03
Positive EBITDA	(0.27)	0.08
Positive Operating Cash Flow	(0.30)	0.09
Days Until Registration	0.26	0.07

Table 4
Quartile Analysis

	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile
Volatility	(47% and under)	(48%–59%)	(57%–78%)	(79%+)
Average	8.95%	10.95%	14.89%	31.63%
Median	8.43%	11.28%	13.00%	29.29%
Standard Deviation	8.65%	9.30%	10.32%	17.75%
Debt Ratio	(32% and under)	(33%–59%)	(60%–90%)	(91%+)
Average	18.09%	15.24%	15.30%	17.78%
Median	14.11%	14.82%	11.21%	14.68%
Standard Deviation	16.08%	9.57%	14.70%	18.39%
Volume	(13K and under)	(14K–52K)	(53K–215K)	(216K+)
Average	24.74%	13.15%	15.76%	12.76%
Median	20.38%	10.91%	15.00%	10.75%
Standard Deviation	21.17%	11.42%	12.23%	9.33%
Shares Placed Per Average Volume	(9 and under)	(10–28)	(29–139)	(140+)
Average	14.30%	14.33%	15.39%	22.39%
Median	13.20%	11.80%	12.78%	18.85%
Standard Deviation	12.11%	14.97%	10.57%	19.55%
Share Turnover	(0.08% and under)	(0.09%–0.32%)	(0.33%–0.69%)	(0.70%+)
Average	24.55%	13.11%	13.94%	14.81%
Median	21.16%	11.18%	12.74%	13.51%
Standard Deviation	21.79%	8.98%	12.77%	10.23%
Market Cap (000s)	(56,490 and under)	(56,491–122,457)	(122,458–297,884)	(297,884+)
Average	20.74%	15.32%	18.52%	11.83%
Median	20.78%	14.91%	16.20%	10.08%
Standard Deviation	18.82%	12.70%	16.51%	8.77%
Revenues (000s)	(1,495 and under)	(1,496–28,249)	(28,250–85,332)	(85,332+)
Average	25.43%	17.49%	12.89%	10.61%
Median	23.97%	14.91%	11.93%	9.63%
Standard Deviation	17.67%	15.28%	11.96%	9.51%
Total Assets (000s)	(17,777 and under)	(17,778–67,142)	(67,143–395,327)	(395,327+)
Average	30.34%	14.26%	14.87%	9.23%
Median	26.12%	11.09%	14.91%	8.82%
Standard Deviation	17.95%	11.09%	9.91%	10.82%
Book Value (000s)	(5,246 and under)	(5,247–22,241)	(22,242–92,041)	(92,041+)
Average	26.22%	19.45%	11.14%	9.61%
Median	23.75%	16.97%	10.89%	8.87%
Standard Deviation	17.44%	15.47%	10.12%	8.99%

quartiles are volatility, book value, and revenues. The average and median implied discounts for all of the other variables analyzed, with the exception of the debt ratio, change as expected from the 1st quartile to the 4th quartile. However, in each of these cases, the change in the averages or the medians from the 2nd quartile to the 3rd quartile was inconsistent. This can partially be attributed to the high standard deviation of the discounts contained in each of these groupings.

The data were further analyzed by constructing quartiles sorted by discount. This analysis is presented in Table 5. In this instance, volatility is the only variable in which the average and median increased as expected

across each quartile. With the exception of the debt ratio, the changes in the averages and the medians of all of the other variables are consistent when going from the 1st quartile to the 4th quartile. However, the changes in the inner quartiles vary. Another apparent trend in the data in Table 5 is the number of over-the-counter stocks that were contained in each quartile. The 4th quartile contained 17 over-the-counter stocks in comparison to only one in the 1st quartile.

The final part of this analysis involved an analysis of registration rights. In the first study, the data were divided into four quartiles based on the number of days the stock remained unmarketable before it was registered. This

Table 5
Quartiles by Discount

	Discount (%)	Revenues (000s)	Total Assets (000s)	Book Value (000s)	Volatility (%)	Average Trading Volume (000s)	Debt Ratio	Market Cap (000s)	Number of OTC Stocks
1st Quartile									
Average	1.30	125,925	855,572	198,287	50.38	337	0.63	381,993	1
Median	1.99	43,241	319,966	55,365	50.84	63	0.61	137,302	
High	6.98	917,574	9,248,229	1,127,228	91.63	2,832	1.66	1,675,956	
Low	-10.16	—	2,958	(159,997)	19.37	1	0.18	20,360	
Standard Deviation	4.61	211,734	1,630,907	338,635	17.65	671	0.36	466,505	
2nd Quartile									
Average	10.26	248,407	977,512	(119,279)	60.98	293	0.74	280,864	5
Median	10.66	42,650	119,144	28,896	56.85	36	0.64	144,083	
High	14.29	5,865,685	17,479,867	610,180	142.02	2,074	6.34	1,383,384	
Low	6.98	—	1,261	(7,695,606)	22.37	0	0.01	5,585	
Standard Deviation	1.99	997,366	3,109,615	1,349,311	27.16	539	1.04	307,789	
3rd Quartile									
Average	18.25	104,616	304,621	62,081	63.82	293	0.77	273,346	7
Median	17.54	26,253	74,477	16,868	57.53	82	0.54	100,942	
High	23.81	1,207,997	3,870,851	662,133	115.67	4,777	6.93	4,514,891	
Low	14.33	—	3,168	(78,435)	26.05	3	—	10,947	
Standard Deviation	3.04	247,455	721,818	123,173	21.14	821	1.15	757,350	
4th Quartile									
Average	36.61	30,596	133,298	23,739	113.15	245	0.94	133,123	17
Median	30.85	2,813	13,375	5,357	99.05	26	0.63	76,470	
High	73.51	238,495	3,215,510	246,770	247.84	4,201	7.62	608,652	
Low	23.81	—	4	(8,772)	32.84	0	0.01	9,879	
Standard Deviation	13.40	59,354	547,734	50,808	53.36	743	1.37	137,779	

analysis was updated using the same time periods that were used in the first study. The update to this analysis is presented in Table 6. A review of these data shows that the average, median, and standard deviation of the discounts are higher for stocks that remain unmarketable for longer periods of time.

Conclusion

This update to the first edition of the TVA restricted stock study contains a brief analysis of the impact of the changes to the required Rule 144 holding period as well as an update to the statistical analyses. The average and median discounts for the 89 transactions that took place

after the change to the Rule 144 holding period were slightly lower than the average and median discounts of the 47 transactions that took place before the change. However, this decrease was not as drastic as one would expect. One possible explanation for this is the level of market volatility that was present in the marketplace during these two time periods. To demonstrate, Figure 1 presents the historic trend in the Chicago Board of Options Exchange Volatility Index (VIX). The trend in this chart shows that volatility in the stock market increased significantly in late 2008 and remained relatively high throughout 2009 and 2010 in comparison to 2007. Considering that the change to the Rule 144 holding period was announced in November 2007, and became effective in February 2008, the transactions that occurred after the rule change took place during a more highly volatile market. In addition, there are other economic, company-specific, and transaction-specific factors that could potentially drive the implied discounts. This further supports the notion that various factors collectively must be considered when trying to quantify implied illiquidity discounts.

Table 6
Analysis of Registration Rights

Days Before Registration	Average (%)	Median (%)	Standard Deviation (%)
0–31 days	12.22	10.26	11.29
32–63 days	15.31	14.08	11.48
64–185 days	16.27	14.59	15.80
185+ days	24.77	18.51	17.55

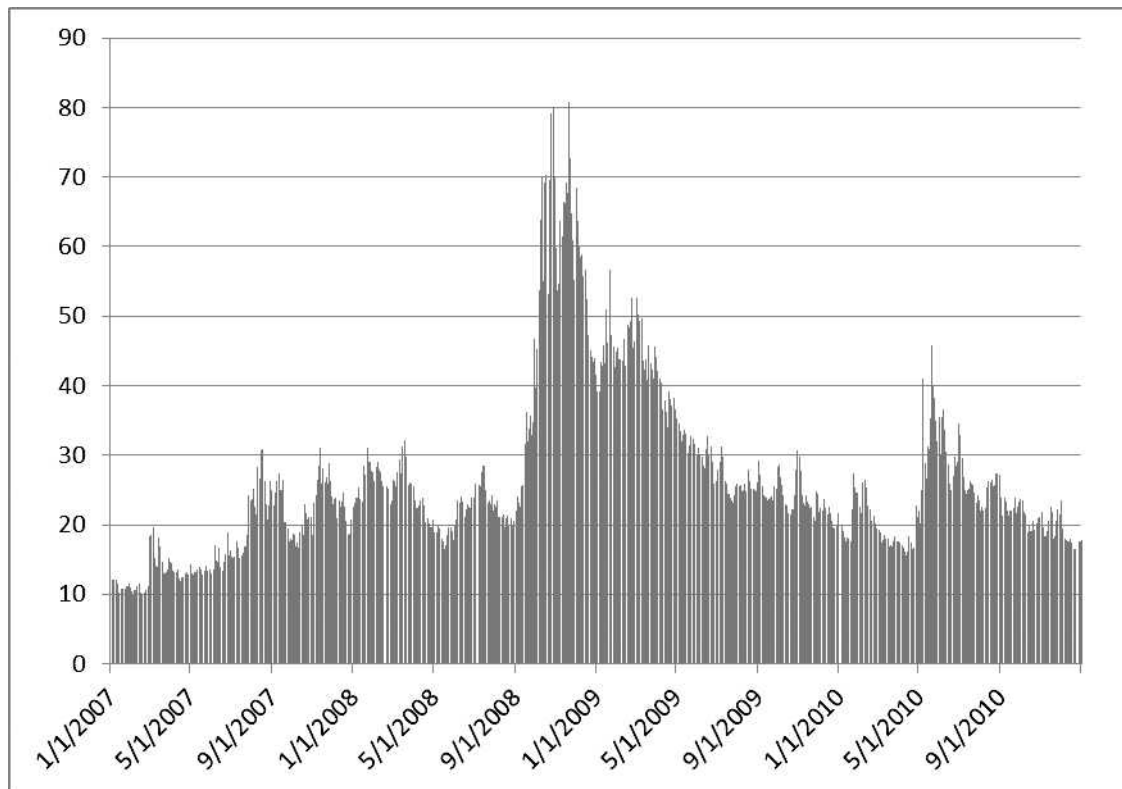


Figure 1
VIX Historical

The update to the statistical analysis performed in the first study resulted in similar conclusions. The only company-specific variable that had a notable statistical relationship with the implied discounts was volatility. While it is possible that the other variables impact the implied discounts to some degree, we were unable to quantify the impact of these variables with a high degree of statistical certainty.

The addition of the new data to the second edition of the TVA restricted stock study provides empirical data on implied illiquidity discounts through 2010. However, when using these new data as a guide to derive a discount for lack of marketability for a closely held business, additional factors must be taken into account, most

notably, the change in the holding period. The holding period for a minority interest in a closely held company is usually much longer than the six-month holding period for the majority of the transactions contained in this study. Valuation theory tells us that this should warrant a larger discount. The question becomes: How much larger should it be when considering the financial condition, dividend paying history, risk, and other factors related to the valuation subject in comparison to the companies contained in this study? These are some of the various factors that must be taken into consideration when using the data from this study and constructing discounts for lack of marketability in general.