

Reprinted with permission from the American Association of Individual Investors, 625 N. Michigan Ave., Chicago, IL 60611; 800-428-2244; [www.aaii.com](http://www.aaii.com). ©2011.

# The Advantages of Diversification and Rebalancing

By Charles Rotblut, CFA

## Article Highlights

- Rebalancing a properly diversified portfolio provides measurable benefits.
- Three portfolios are presented: The one that was rebalanced annually had the highest returns and the lowest volatility.
- Diversification increases the odds of owning the “right” asset. Rebalancing forces you to “buy low and sell high.”

**D**iversification and regular portfolio rebalancing provide measurable benefits to investors. This statement holds true even though the last decade bought two bear markets for stocks and the outlook for the future is currently anything but certain.

I realize that saying diversification and rebalancing help may surprise some of you. The roller-coaster ride stocks have been on and the portfolio devastation experienced by many investors has created a great deal of skepticism about whether the cornerstones of portfolio management still work. Yet the data shows that they do in fact work.

To prove this point, last December I created a simple portfolio consisting of \$50,000 in the Vanguard 500 Index (VFINX) and \$50,000 in the Vanguard Total Bond Market Index (VBMFX) mutual funds. I ran the numbers as if the portfolios had been held during the “lost decade” of 2000 – 2009. As some of you may remember from my commentary in our weekly AAI Investor Update e-newsletter on December 16, 2010, there was an advantage to annual rebalancing.

Though the simplicity worked to prove a point, advocates of diversification suggest that investors hold more than just large-cap stocks and bonds. Plus, I received e-mails from members asking what would happen if other assets were included. So, I decided to expand the number of funds included in the portfolio and rerun the numbers. As you will



soon see, a diversified portfolio would have given better returns. Rebalancing on a regular basis (e.g., annually) would have lowered the volatility of the fully diversified portfolio, making for a winning combination.

## The Portfolios

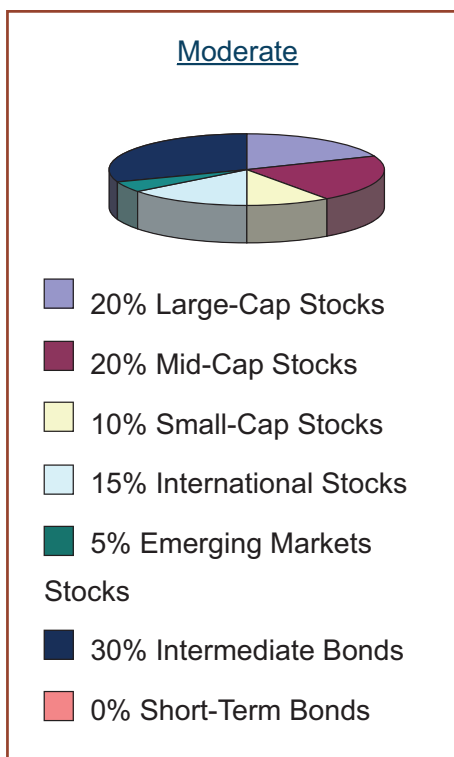
The portfolios were designed based on one of the AAI Asset Allocation Models, which can be viewed at [www.aaii.com/asset-allocation](http://www.aaii.com/asset-allocation). I chose

the Moderate Investor profile, which assumes an investment horizon of 20+ years. Figure 1 shows the composition of this model. (Allocation ultimately depends on age, health and wealth. The longer the time period before you need to withdraw cash and the less cash you need relative to the size of your portfolio, the higher your exposure can be to risky assets such as stocks and stock funds.)

To conduct the test, I wanted to duplicate what an actual investor would have been able to do. I chose Vanguard index mutual funds for the portfolios to limit the influence that an active manager would have had on the returns. Additionally, using a single fund family limited transaction costs.

An investor might have been able to achieve higher returns by making astute choices about actively managed funds and not sticking to a single fund family. The trade-off, however, would have been higher management fees, transaction costs and the timing issues of switching from one fund family to another. By choosing Vanguard, I avoided the issues of expenses and switching fund families, at the cost of not achieving the most optimal return.

**Figure 1. Suggested Allocations for the Moderate Investor Profile**



Because I was solely using Vanguard, I had to start the study at the beginning of 1988. This was the first full calendar year that an investor would have been able to own the Vanguard's Extended Market Index fund (VEXMX).

I also was not fully able to exclude active management, even by sticking with Vanguard. In 1988, the only international funds that the company offered were actively managed. Therefore, I used the Vanguard International Value fund (VTRIX), an actively managed fund, until the end of 1996. At the start of 1997, I was able to switch to a passively managed fund, the Vanguard Total International Stock Index fund (VGTIX). This fund was incepted in April 1996.

Finally, the decision to stick with Vanguard meant that funds for all the desired asset classes were not available for the entire period. For example, Vanguard Emerging Markets Stock Index fund (VEIEX) was not incepted until 1994. To get around this, I used the broad-based Vanguard International Value fund (VTRIX) until the end of 1994 and then split some of the portfolio

dollars into the emerging market fund (more on this momentarily).

### The Mutual Funds

The mutual funds used for the portfolios are listed below. Funds were included at the start of the 1988 or at the start of the first full calendar year after their inception.

- Vanguard 500 Index (VFINX),
- Vanguard Extended Market Index (VEXMX),
- Vanguard Mid-Cap Index (VIMSX),
- Vanguard Small-Cap Index (NAESX),
- Vanguard International Value (VTRIX),
- Vanguard Emerging Markets Stock Index (VEIEX),
- Vanguard Total International Stock Index (VGTIX), and
- Vanguard Total Bond Market Index (VBMFX).

The starting portfolios held Vanguard 500 Index, Vanguard Extended Market Index, Vanguard International Value, and Vanguard Total Bond Market Index funds.

The Vanguard Extended Market Index tracks the performance of the Standard & Poor's Completion Index. This index contains all regularly traded U.S. exchange-listed common stocks, except those stocks included in the S&P 500 index. The fund was held until the start of 1999, when the holding was switched to two other funds: 67% of the fund's value was shifted to the Vanguard Mid-Cap Index and 33% was moved to the Vanguard Small-Cap Index. In order to avoid overweighting small-cap stocks, I kept the small-cap fund out of the portfolio until the mid-cap fund became available.

At the start of 1995, 25% of the dollars held in Vanguard International Value were moved to Vanguard Emerging Markets Stock Index to match the model's allocation weightings. At the start of 1997, the remaining dollars held in Vanguard International Value were moved to Vanguard Total International Stock Index, a broad-based, passively managed international fund.

### Portfolio Construction & Management

Three portfolios were created: static, moderate and rebalanced. All three had a starting value of \$100,000. Allocations for the moderate and rebalanced portfolios matched the Moderate Investor profile as close as would have been possible at the start of 1988.

The Static Portfolio assumes that an investor looked at the asset allocation model, developed a basic understanding of the need for diversification and split \$100,000 evenly among Vanguard 500 Index, Vanguard Extended Market Index, Vanguard International Value, and Vanguard Total Bond Market Index funds at the start of 1988 (\$25,000 in each fund). No changes were made after the funds were originally bought. This strategy may most closely resemble the manner in which many investors have managed their IRA accounts. The Static Portfolio is presented in Table 1.

The Moderate Portfolio was originally designed to mimic the Moderate Investor profile. Portfolio dollars were allocated to Vanguard 500 Index, Vanguard Extended Market Index, Vanguard International Value, and Vanguard Total Bond Market Index funds in proportion to the asset allocation model at the start of 1988. For example, \$20,000 was invested in the large-cap Vanguard 500 Index fund and \$30,000 was invested in the fixed-income Vanguard Total Bond Market Index.

After the portfolio was originated, however, it was not rebalanced. The only changes occurred when new funds became available. On those occasions, portfolio dollars were simply shifted from the older fund to the newer fund. As a result, changes in allocations reflected fluctuations in each fund's comparative performance, but not any direct involvement on the part of the investor. The Moderate Portfolio is presented in Table 2.

The Rebalanced Portfolio was also designed to mimic the Moderate Investor profile, with funds proportionately allocated to Vanguard 500 Index, Vanguard Extended Market Index, Vanguard

Table 1. The Static Portfolio

	Vanguard 500 Index VFINX	Vanguard Extended Market Index VEXMX	Vanguard Mid-Cap Index VIMSX	Vanguard Small-Cap Index NAESX	Vanguard Int'l Value VTRIX	Vanguard Emerging Mkts Stock Index VEIEX	Vanguard Total Int'l Stock Index VGTSX	Vanguard Total Bond Market Index VBMFX	Portfolio Total	Annual Portfolio Return
<b>Initial Investment</b>	\$25,000	\$25,000	—	—	\$25,000	—	—	\$25,000	\$100,000	
<b>1988</b>	29,055	29,937	—	—	29,695	—	—	26,838	115,524	15.5%
<b>1989</b>	38,167	37,150	—	—	37,406	—	—	30,498	143,222	24.0%
<b>1990</b>	36,900	31,933	—	—	32,820	—	—	33,136	134,789	(5.9%)
<b>1991</b>	48,051	45,296	—	—	36,088	—	—	38,189	167,624	24.4%
<b>1992</b>	51,616	50,943	—	—	32,941	—	—	40,916	176,416	5.2%
<b>1993</b>	56,721	58,325	—	—	42,986	—	—	44,877	2 02,908	15.0%
<b>1994</b>	57,390	57,296	—	—	45,245	—	—	43,683	203,614	0.3%
<b>1995</b>	78,883	76,660	—	—	49,609	—	—	51,625	256,776	26.1%
<b>1996</b>	96,931	90,188	—	—	54,678	—	—	53,473	295,271	15.0%
<b>1997</b>	129,102	114,257	—	—	52,174	—	—	58,521	354,053	19.9%
<b>1998</b>	166,103	123,801	—	—	62,328	—	—	63,542	415,774	17.4%
<b>1999</b>	201,101	168,639	—	—	75,897	—	—	63,059	508,696	22.3%
<b>2000</b>	182,881	142,476	—	—	70,268	—	—	70,241	465,866	(8.4%)
<b>2001</b>	160,899	129,415	—	—	60,392	—	—	76,163	426,869	(8.4%)
<b>2002</b>	125,260	106,038	—	—	52,328	—	—	82,454	366,079	(14.2%)
<b>2003</b>	160,959	152,087	—	—	74,252	—	—	85,727	473,024	29.2%
<b>2004</b>	178,246	180,538	—	—	88,928	—	—	89,362	537,073	13.5%
<b>2005</b>	186,748	199,108	—	—	104,901	—	—	91,507	582,263	8.4%
<b>2006</b>	215,955	227,528	—	—	133,611	—	—	95,414	672,509	15.5%
<b>2007</b>	227,595	237,376	—	—	150,525	—	—	102,017	717,513	6.7%
<b>2008</b>	143,340	145,445	—	—	87,697	—	—	107,169	483,650	(32.6%)
<b>2009</b>	181,310	199,883	—	—	117,309	—	—	113,524	612,027	26.5%
<b>2010</b>	208,326	254,452	—	—	125,873	—	—	120,789	709,439	15.9%
<b>Ending Value</b>	<b>\$208,326</b>	<b>\$254,452</b>	—	—	<b>\$125,873</b>	—	—	<b>\$120,789</b>	<b>\$709,439</b>	
<b>Portfolio Weight</b>	<b>29%</b>	<b>36%</b>	—	—	<b>18%</b>	—	—	<b>17%</b>	<b>100%</b>	
								<b>Annualized Return</b>		<b>8.9%</b>
								<b>Standard Deviation</b>		<b>15.4%</b>

International Value, and Vanguard Total Bond Market Index funds at the start of 1988. This portfolio, however, was rebalanced annually to ensure that it continued to mimic the model's allocation percentages as closely as possible. (For example, the large-cap portion of the portfolio was adjusted so that it comprised just 20% of the portfolio's total value at the start of every calendar year.)

This meant shifting money out of the best-performing funds and into the worst-performing funds. When a new fund was added, dollars were first shifted from the older fund into the newer fund and then entire portfolio was reallocated.

The Rebalanced Portfolio is presented in Table 3.

### Performance Results

Diversification and rebalancing provided clear benefits. The Rebalanced Portfolio, which was rebalanced annually to match the allocation percentages of the Moderate Investor profile, provided the highest annualized return, 9.7%, and the lowest level of volatility, a standard deviation of 12.7%. The Moderate Portfolio, which was originally set up to track the Moderate Investor profile and then mostly left alone, produced a lower

annualized return of 9.4% and higher level of volatility (standard deviation of 14.6%). The Static Portfolio fared the worst with an annualized return of just 8.9%. It also experienced the highest level of volatility with a standard deviation of 27.1%.

The Moderate Portfolio and The Rebalanced Portfolio were adjusted to provide increased exposure to Vanguard Emerging Markets Stock Index fund (VEIEX), and this boosted their performance. Emerging markets was one of the best-performing mutual fund categories over the past five years, as was shown in the March 2011 *AIII*

**Table 2. The Moderate Portfolio**

	Vanguard 500 Index VFINX	Vanguard Extended Market Index VEXMX	Vanguard Mid-Cap Index VIMSX	Vanguard Small-Cap Index NAESX	Vanguard Int'l Value VTRIX	Vanguard Emerging Mkts Stock Index VEIEX	Vanguard Total Int'l Stock Index VGTSX	Vanguard Total Bond Market Index VBMFX	Portfolio Total	Annual Portfolio Return
<b>Initial Investment</b>	\$20,000	\$30,000	—	—	\$20,000	—	—	\$30,000	\$100,000	
<b>1988</b>	23,244	35,924	—	—	23,756	—	—	32,205	115,129	15.1%
<b>1989</b>	30,533	44,580	—	—	29,925	—	—	36,598	141,637	23.0%
<b>1990</b>	29,520	38,319	—	—	26,256	—	—	39,763	133,858	(5.5%)
<b>1991</b>	38,440	54,356	—	—	28,870	—	—	45,827	167,494	25.1%
<b>1992</b>	41,293	61,132	—	—	26,353	—	—	49,099	177,876	6.2%
<b>1993</b>	45,377	69,990	—	—	34,389	—	—	53,852	203,607	14.5%
<b>1994</b>	45,912	68,755	—	—	36,196	—	—	52,420	203,282	(0.2%)
<b>1995</b>	63,106	91,992	—	—	29,765	\$9,099	—	61,950	255,913	25.9%
<b>1996</b>	77,545	108,226	—	—	32,807	10,540	—	64,168	293,285	14.6%
<b>1997</b>	103,282	137,108	—	—	—	8,766	\$32,553	70,225	351,934	20.0%
<b>1998</b>	132,882	148,561	—	—	—	7,178	37,632	76,250	402,503	14.4%
<b>1999</b>	160,881	—	\$114,784	\$60,366	—	11,597	48,891	75,671	472,189	17.3%
<b>2000</b>	146,305	—	135,557	58,757	—	8,401	41,257	84,290	474,568	0.5%
<b>2001</b>	128,719	—	134,881	60,579	—	8,160	32,943	91,395	456,676	(3.8%)
<b>2002</b>	100,208	—	115,177	48,450	—	7,553	27,974	98,945	398,307	(12.8%)
<b>2003</b>	128,767	—	154,501	70,556	—	11,908	39,259	102,873	507,863	27.5%
<b>2004</b>	142,597	—	185,947	84,595	—	15,018	47,439	107,234	582,830	14.8%
<b>2005</b>	149,398	—	211,851	90,824	—	19,832	54,826	109,808	636,538	9.2%
<b>2006</b>	172,764	—	240,656	105,043	—	25,661	69,430	114,497	728,051	14.4%
<b>2007</b>	182,076	—	255,146	106,257	—	35,643	80,207	122,420	781,749	7.4%
<b>2008</b>	114,672	—	148,434	67,930	—	16,819	44,835	128,602	521,291	(33.3%)
<b>2009</b>	145,048	—	208,131	92,465	—	29,597	61,301	136,228	672,771	29.1%
<b>2010</b>	166,660	—	260,996	118,078	—	35,161	68,106	144,947	793,948	18.0%
<b>Ending Value</b>	<b>\$166,660</b>	<b>—</b>	<b>\$260,996</b>	<b>\$118,078</b>	<b>—</b>	<b>\$35,161</b>	<b>\$68,106</b>	<b>\$144,947</b>	<b>\$793,948</b>	
<b>Portfolio Weight</b>	<b>21%</b>	<b>—</b>	<b>33%</b>	<b>15%</b>	<b>—</b>	<b>4%</b>	<b>9%</b>	<b>18%</b>	<b>100%</b>	
								<b>Annualized Return</b>		<b>9.4%</b>
								<b>Standard Deviation</b>		<b>14.6%</b>

Journal. Furthermore, Vanguard Emerging Markets Stock Index fund had the highest annualized return since 1999 of all funds listed in this article. The trade-off, however, was that the fund also experienced the highest level of volatility. High returns never come without high risk, and Vanguard Emerging Markets Stock Index fund is evidence of this.

It is important to realize that an investor would not have needed foresight about the performance of emerging markets to invest in Vanguard Emerging Markets Stock Index fund when it became available. Rather, an investor would have just needed an understand-

ing of the role emerging markets can play an overall diversification strategy. A big upside of diversification is that it increases the odds of being in the right asset class at the right time.

It should also be noted that the Static Portfolio did not hold Vanguard Emerging Markets Stock Index fund and still had the highest level of overall volatility. An often overlooked benefit of diversification is that adding a volatile asset can lower a portfolio's overall risk level if the asset is not highly correlated with the other investments. Emerging market stocks have historically experienced different long-term return charac-

teristics than U.S. and European stocks.

Perhaps the biggest lesson is the importance of a being a proactive investor. Merely rebalancing the portfolio annually increased returns and lowered volatility, as the return data shows. For example, the Rebalanced Portfolio lost 26.4% in 2008 versus 33.3% for the Moderate Portfolio and 32.6% for the Static Portfolio. The Rebalanced Portfolio also experienced smaller losses than the other two portfolios in 1990 and 2002. In addition, it posted a fractional gain in 2001, whereas the other two portfolios lost money.

In exchange for cushioning the blow

Table 3. The Rebalanced Portfolio

	Vanguard 500 Index VFINX	Vanguard Extended Market Index VEXMX	Vanguard Mid-Cap Index VIMSX	Vanguard Small-Cap Index NAESX	Vanguard Int'l Value VTRIX	Vanguard Emerging Mkts Stock Index VEIEX	Vanguard Total Int'l Stock Index VGTSX	Vanguard Total Bond Market Index VBMFX	Portfolio Total	Annual Portfolio Return
<b>Initial Investment</b>	\$20,000	\$30,000	—	—	\$20,000	—	—	\$30,000	\$100,000	
<b>1988</b>	23,244	35,924	—	—	23,756	—	—	32,205	115,129	15.1%
<b>1989</b>	30,247	42,861	—	—	29,006	—	—	39,250	141,363	22.8%
<b>1990</b>	27,334	36,453	—	—	25,450	—	—	46,077	135,313	(4.3%)
<b>1991</b>	35,241	57,583	—	—	27,983	—	—	46,785	167,592	23.9%
<b>1992</b>	36,005	56,545	—	—	25,543	—	—	53,867	171,961	2.6%
<b>1993</b>	37,794	59,063	—	—	33,332	—	—	56,582	186,771	8.6%
<b>1994</b>	37,795	55,043	—	—	35,084	—	—	54,541	182,462	(2.3%)
<b>1995</b>	50,159	73,239	—	—	30,009	\$9,174	—	64,690	227,271	24.6%
<b>1996</b>	55,854	80,213	—	—	37,574	13,162	—	70,622	257,427	13.3%
<b>1997</b>	68,573	97,838	—	—	—	10,706	\$38,315	84,518	299,950	16.5%
<b>1998</b>	77,183	97,501	—	—	—	12,280	52,013	97,706	336,682	12.2%
<b>1999</b>	81,524	—	\$78,040	\$41,042	—	27,199	65,612	100,237	393,655	16.9%
<b>2000</b>	71,598	—	92,164	38,316	—	14,259	49,828	131,548	397,713	1.0%
<b>2001</b>	69,982	—	91,704	41,004	—	19,314	47,634	129,372	399,009	0.3%
<b>2002</b>	62,126	—	78,308	31,912	—	18,468	50,824	129,590	371,228	(7.0%)
<b>2003</b>	95,406	—	105,044	54,061	—	29,262	78,147	115,790	477,709	28.7%
<b>2004</b>	105,803	—	126,423	57,276	—	30,124	86,587	149,389	555,603	16.3%
<b>2005</b>	116,421	—	144,035	59,651	—	36,684	96,317	170,681	623,790	12.3%
<b>2006</b>	144,270	—	163,619	72,145	—	40,357	118,492	195,128	734,011	17.7%
<b>2007</b>	154,715	—	173,471	74,250	—	50,978	127,192	235,441	816,047	11.2%
<b>2008</b>	102,789	—	100,918	52,170	—	19,253	68,424	257,177	600,732	(26.4%)
<b>2009</b>	151,973	—	141,506	81,770	—	52,857	123,204	190,907	742,218	23.6%
<b>2010</b>	170,562	—	177,448	94,781	—	44,088	123,691	236,916	847,486	14.2%
<b>Ending Value</b>	<b>\$170,562</b>	<b>—</b>	<b>\$177,448</b>	<b>\$94,781</b>	<b>—</b>	<b>\$44,088</b>	<b>\$123,691</b>	<b>\$236,916</b>	<b>\$847,486</b>	
<b>Portfolio Weight</b>	<b>20%</b>	<b>—</b>	<b>21%</b>	<b>11%</b>	<b>—</b>	<b>5%</b>	<b>15%</b>	<b>28%</b>	<b>100%</b>	
									<b>Annualized Return</b>	<b>9.7%</b>
									<b>Standard Deviation</b>	<b>12.7%</b>

of bear markets, rebalancing annually will cause returns to lag during a strong bull market for the largest asset classes held in a portfolio. Such was the case in the late 1990s when the Rebalanced Portfolio posted smaller gains than the other two portfolios. The reason is that rebalancing forces an investor to take profits from the best-performing asset class and put the money into the worst-performing asset class. This is the classic “buy low and sell high” strategy.

Since the money is moved out of the “winners” and into the “losers,” annual rebalancing can give the impression that it is not working over short periods of

time. This is a misperception because rebalancing is designed to force an investor to sell into momentum. In other words, it reduces downside volatility by lowering the impact that a bubble in a particular asset class would have on the portfolio.

### Are There Alternatives?

As the annual results show, neither diversification nor rebalancing will prevent a portfolio from fluctuating in value. They certainly will not prevent a portfolio from losing money in a severe bear market such as 2008.

The alternatives, however, produce even worse performance and more volatility. Failing to rebalance hurt the returns, as shown here. Market timing is intended to signal when to buy and sell a particular asset, but it fails to make correct calls on a consistent basis. Worse yet, if a market timing system causes you to be late with your buy and sell decisions, you could lock in big losses and miss out on big rebounds.

Options could provide a hedge, but they also hurt returns due to commissions and the probability that they will expire worthless. Plus, exercising a put option (a contract to sell a security at a

# How Your Age Affects Diversification and Rebalancing

How you allocate your portfolio depends on age, health and wealth. The longer the period of time before you need to withdraw cash and the smaller the proportion of total savings that will be withdrawn, the greater your tolerance for risk.

Investors in their 20s will not need their retirement savings for several decades. Therefore, they can withstand a lot of volatility within their portfolios and should have a very high allocation to stocks.

Retirees, conversely, usually need to withdraw from their portfolios. The amount of the withdrawal will depend on lifestyle, health and other sources of income (e.g., a pension). Such investors may need a higher allocation to bonds than is suggested in the Moderate Investor profile.

Both kinds of investor will need to factor in their age and changes in their lives as they rebalance. A rule

of thumb is to increase the allocation to bonds by 1% each year. This measure must be adjusted, however, for any changes in financial needs.

An investor needing to withdraw money should use annual rebalancing to free up cash. Proceeds from the best-performing asset classes should first be used to fund the withdrawal. The portfolio is then rebalanced.

Finally, be sure to consider tax issues when diversifying and rebalancing. The most tax-efficient assets—including municipal bonds and stock index funds—should be held in taxable accounts. Investments that are more likely to incur taxes should be held in tax-deferred accounts. Similarly, income-producing investments—including dividend-paying stocks—may be more suitable for a traditional IRA than a Roth IRA because they produce cash for required minimum distributions (RMDs).

set price within a given time period) subjects you to the risks of market timing.

## Conclusion

Both diversification and rebalancing

are long-term strategies, and they should be treated as such. A common mistake that investors make is abandoning the strategies rather than sticking with them. Failing to stick with these strategies increases your portfolio's exposure to

the whims of the market, as the data in this article has shown.

There is no magical formula to building and preserving wealth. Rather, it requires patience, discipline and a sound portfolio strategy. ▲

---

**Charles Rotblut, CFA, is a vice president at AAIL and editor of the AAIL Journal. Follow him on Twitter at [twitter.com/charlesrotblut](https://twitter.com/charlesrotblut).**