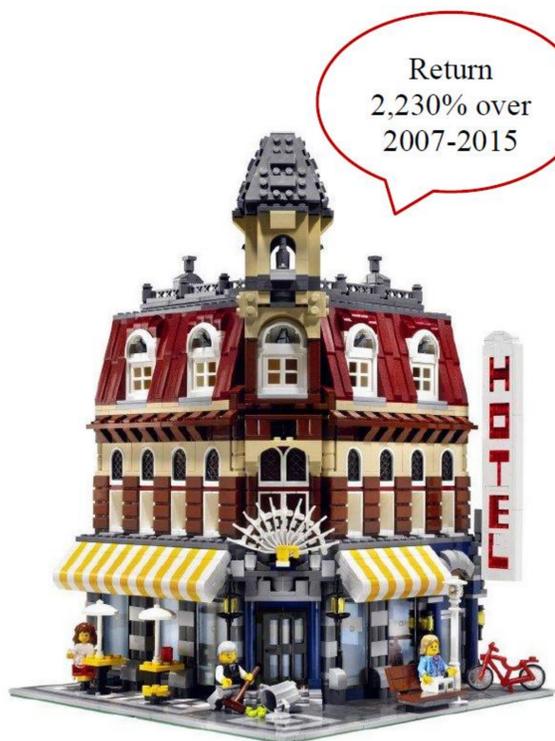


LEGO- The Toy of Smart Investors

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Why LEGO?

LEGO is not only a kids' toy!

- Popular among adult collectors;
- Used by artists (e.g. Nathan Sawaya);
- Used by businessmen (thematic museums, cafes, LEGOLands);
- Serves as an alternative investment:



- A huge secondary market (e.g. EBay) with tens of thousands of sets traded every day (Maciorovsky, 2015)
- Average return was 12% pa in 2000-2015 and returns on particular sets reach outrageous numbers (up to 600% pa) (Telegraph, 2015)
- An asset with diminishing over time supply.

This paper

- We study LEGO as an alternative investment.
- Sample period 1987-2015.
- The average return is 11% (8% in real terms) => LEGO outperforms large stocks, bonds, gold and other 'hobby investments'.
- The LEGO returns are not exposed to market, value, momentum and volatility risk factors.
- An almost unit exposure to the FF SMB factor.
- A positive alpha of 4-5%, the Sharpe ratio of 0.4, positive skewness.
- Small and huge sets are more profitable than medium-sized sets.
- Seasonal, architectural and movie-based themes deliver higher returns.
- Returns are higher in recent years (deeper secondary market and more LEGO trading platforms).

Data

2,322 LEGO sets in 44 themes released in 1981-2015.
Secondary market prices for sealed sets in 2015.

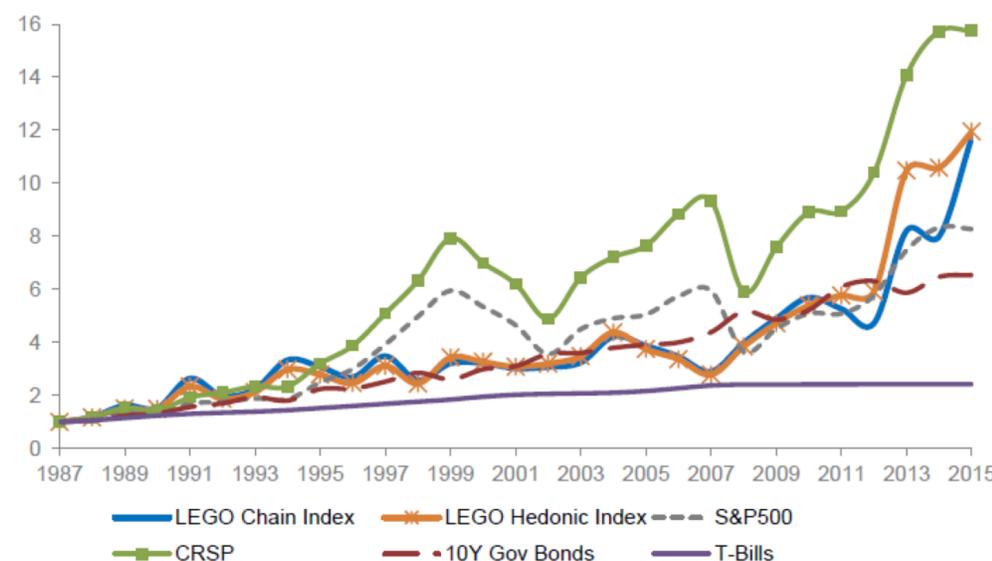
Statistics of LEGO price indices

	Chain index returns	Hedonic index returns	CRSP returns
Average return	0.11	0.10	0.12
Standard deviation	0.28	0.25	0.18
Skewness	0.69	0.75	-0.73
Corr. with S&P500	0.13	0.16	0.99
Corr. with CRSP	0.20	0.24	1.00
Corr. with bonds	-0.13	-0.16	-0.15
Corr. of LEGO indices	0.95		

Conclusion

- A novel analysis of financial returns in the LEGO market.
- LEGO is a reasonable alternative investment with average returns comparable to stock returns, low market and crash risks and a positive alpha.

Dynamics of LEGO price indices



Exposure of LEGO returns to risk factors

	Chain index			Hedonic index		
alpha	0.0424	0.0426	0.0487	0.0358	0.0394	0.0471
	[0.8213]	[0.6879]	[0.7335]	[0.7479]	[0.7330]	[0.8841]
Rm	0.3581	0.2441	0.2149	0.3835	0.2577	0.2212
	[1.0069]	[0.6886]	[0.5234]	[1.0977]	[0.7364]	[0.5723]
SMB		1.1000	1.0749		1.0967	1.0654
		[2.6623]	[2.1889]		[3.2954]	[2.6490]
HML		-0.4667	-0.4859		-0.4894	-0.5133
		[-1.2741]	[-1.2320]		[-2.0049]	[-1.8234]
MOM		0.1934	0.1808		0.1671	0.1513
		[0.9216]	[0.8338]		[1.0401]	[0.9524]
VIX			-0.0321			-0.0400
			[-0.1327]			[-0.1808]
R ²	0.0510	0.2555	0.2560	0.0724	0.3280	0.3289

- Returns on LEGO are higher than returns on most other alternative investments.
- Moreover, discounted purchases of LEGO sets on the primary market make LEGO investments even more profitable.
- Different LEGO sets are not equally attractive (small and very large sets yield higher returns, some themes are more attractive than others).