

Panel: “MRF Operations in New Terrain: Technology, Partnerships, and Policy Impacts”

Presentation to NERC

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Overview

- Huge volumes of recyclables sent to landfills each year
- Market mechanisms for PCM are suboptimal
 - OTC dominates
 - Other commodities have different mechanism
- Exchange-traded derivatives can help!

“PCM” = Post-Consumer Material



<https://www.businessinsider.com/unwashed-recyclables-go-to-landfill-2015-9>



<https://www.alamy.com/chicago-board-of-trade-cbot-stock-exchange-trading-floor-chicago-illinois-image5728907.html>



Recycled Materials Index Prices: 2005-2020



Our Project

- What's wrong with recycling (markets)?
- How can derivatives be useful?
- Pricing and volatility
- An ideal PCM futures contract
- Why this time?

What's wrong with recycling (markets)?

Twin realities:

- 48.2% of US waste stream is recyclable, yet only 48.9% of that amount is actually recycled
 - 68.2% of eligible paper
 - 8.5% of eligible plastic
 - 34.0% of eligible metals
 - 25.0% of eligible glass



Pepsi: Better infrastructure needed on plastic recovery

Posted on October 1, 2019

<https://resource-recycling.com/recycling/2019/10/01/pepsi-better-infrastructure-needed-on-plastic-recovery/>

What's wrong with recycling (markets)?

Common contaminants



- Commodities, but not always traded as such
 - Limited centralized market mechanisms
 - Easy substitution with virgin materials
- Quality issues

What are derivatives? How might they help?



- Manage risk
- Impose quality/quantity standards

"Oh, not much. Well, still dabbling a bit in commodities futures."

What are derivatives? How might they help?

From finance research, we know that introducing derivatives:

- Reduces share price volatility and total volatility
- Increases share price
- Increases trade volume and depth of limit order book
- Reduces daily return variance, average spread size
- Lessens adverse selection
- **True for equities and commodities!**

New derivatives for new products also have made positive impacts



How does this improve the state of recycling?

Less volatility
Higher quality = **A more attractive**
Greater consistency **recycling industry**
Easier buy/sell operations

Volatility in PCM Markets

RECYCLINGMARKETS.NET

**SECONDARY
MATERIALS
PRICING.COM**

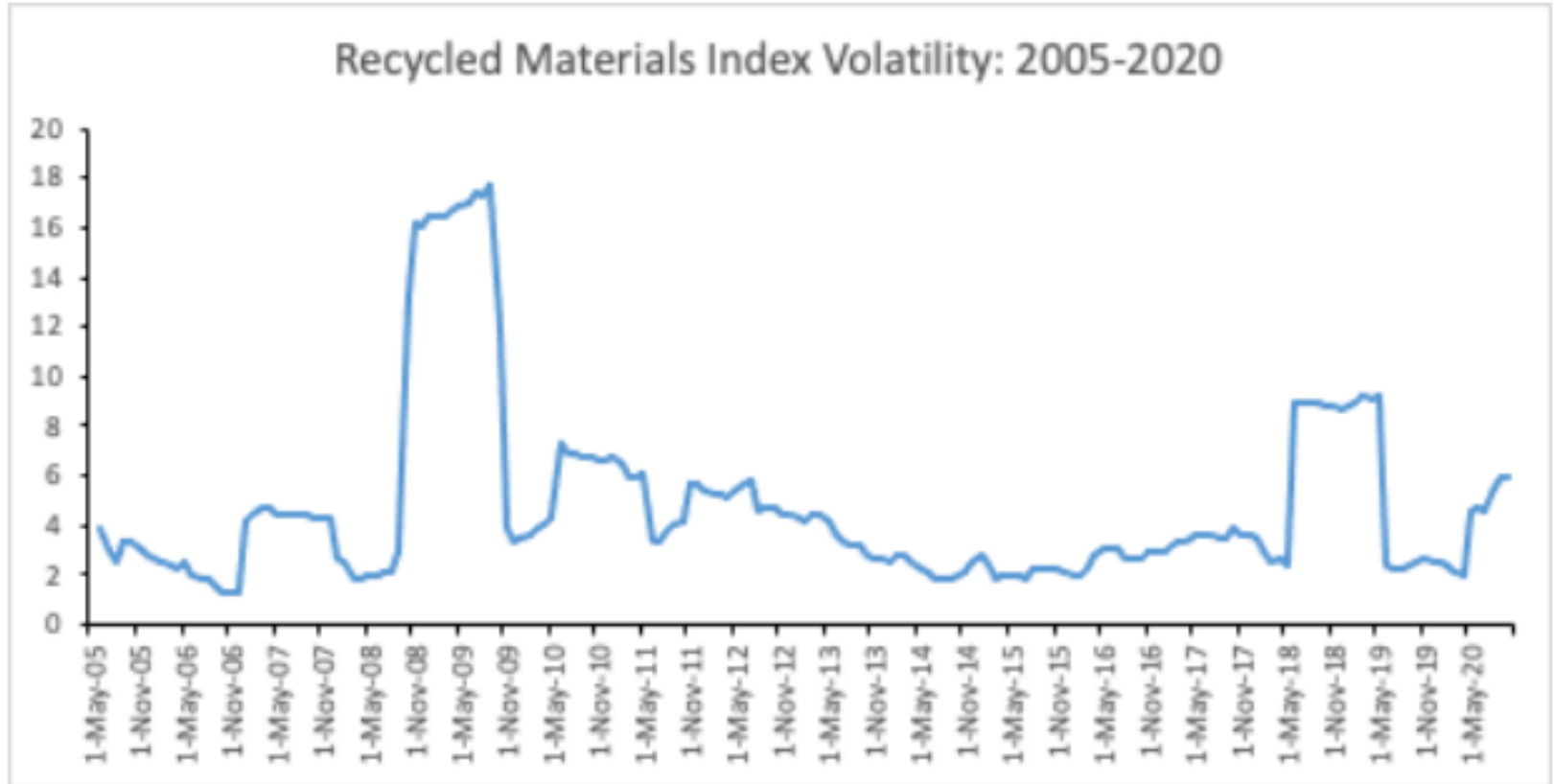
- Monthly time series data for 13 different types of PCM
- National averages of regional prices
- May 2005 - October 2020
- Calculated time series of monthly returns for an equal-weighted index; volatility of that index

Panel A: Prices in US Cents per Pound				
PCM	Max (MM/YY)	Min (MM/YY)	Return	St. Dev.
Plastic PET Baled (#1)	36.50 (04/11)	3.83 (01/09)	-73.9%	12.0%
Natural HDPE (#2)	63.44 (10/20)	11.69 (12/08)	116.5%	12.6%
Colored HDPE (#2)	36.50 (10/08)	3.58 (06/20)	-31.6%	18.9%
Commingled #1-7	10.90 (08/11)	0.81 (10/20)	-66.7%	14.1%
PolyPropylene (#5)	15.25 (05/16)	3.00 (05/20)	-38.1%	10.4%
Aluminum Cans Baled	96.31 (05/11)	39.13 (06/20)	-29.3%	5.9%
Aluminum Cans Loose	82.81 (06/07)	19.00 (06/20)	-37.5%	7.2%
Panel B: Prices in US Dollars per Ton				
PCM	Max (MM/YY)	Min (MM/YY)	Return	St. Dev.
Flint/Clear Glass	45.00 (02/18)	20.17 (01/09)	39.2%	3.1%
Amber Glass	35.00 (02/18)	8.00 (01/09)	51.2%	5.4%
Green Glass	13.69 (05/16)	4.42 (09/05)	115.3%	7.6%
Sorted Residential Paper	158.57 (09/08)	5.94 (04/18)	-56.4%	32.6%
Corrugated Containers	180.00 (06/17)	22.19 (12/08)	-35.2%	15.7%
Sorted Office Paper	297.19 (08/11)	82.81 (11/20)	-23.0%	8.4%

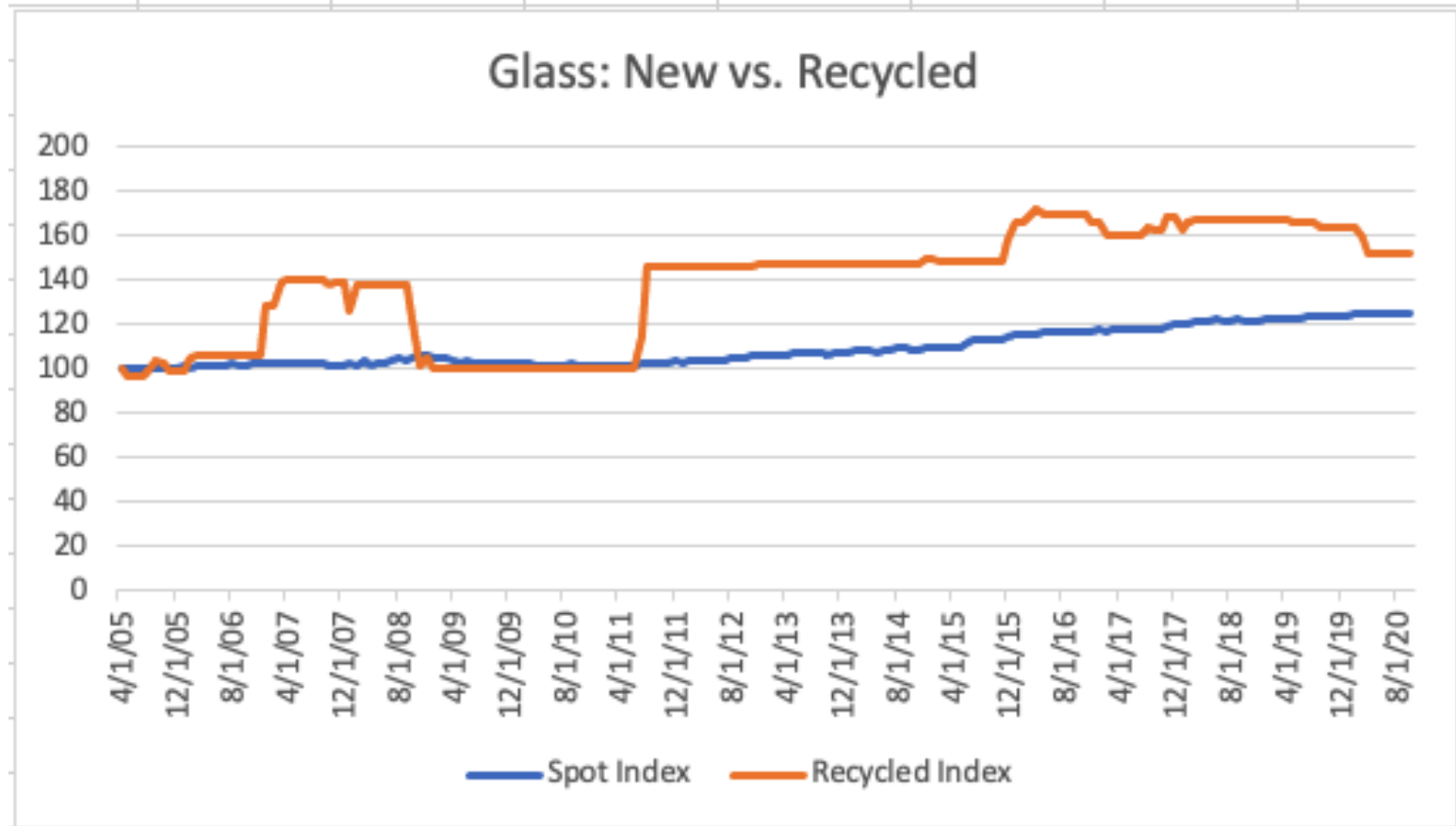
Volatility in PCM Markets



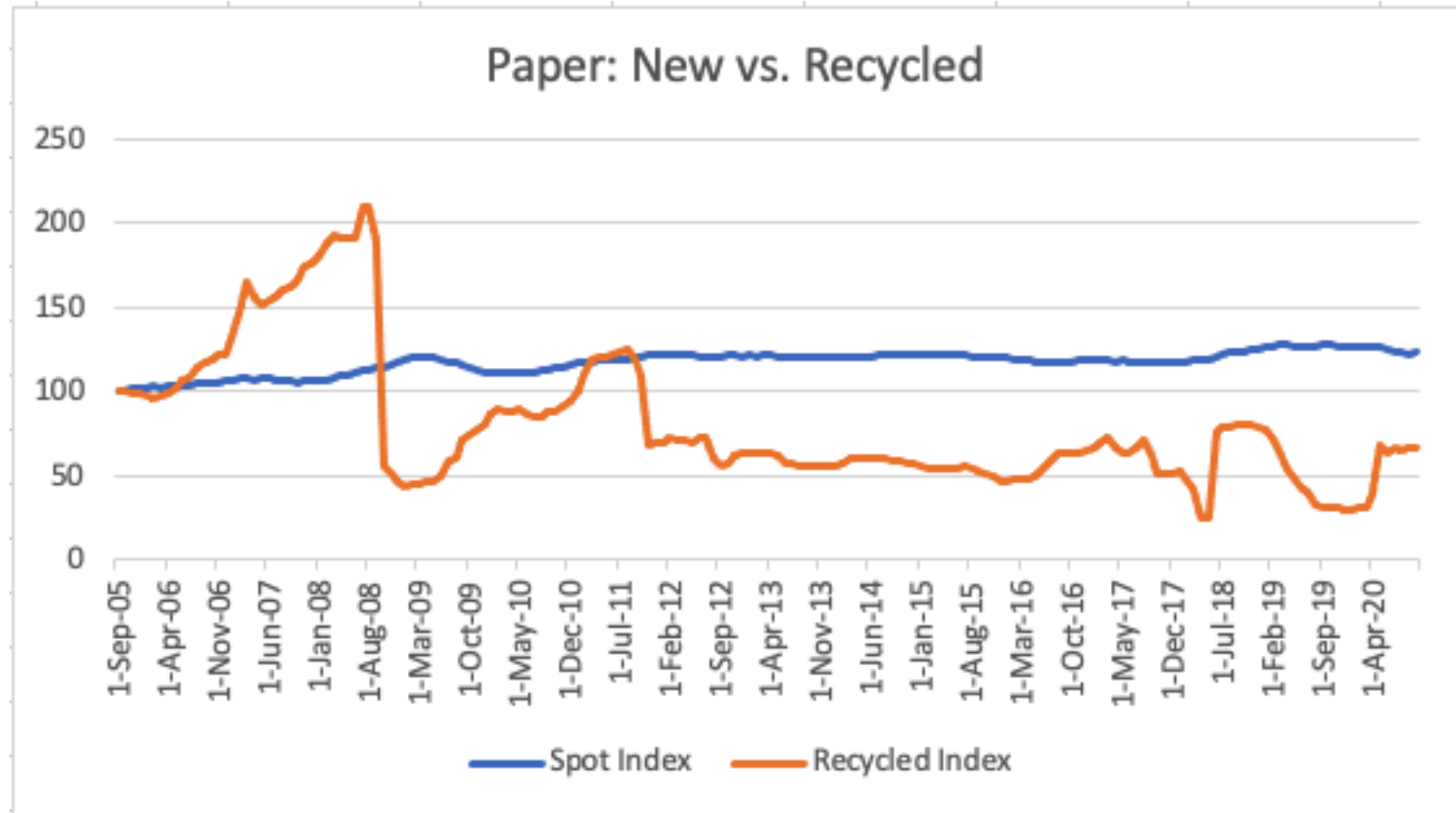
Volatility in PCM Markets



Volatility in specific materials



Volatility in specific materials



Prices for the S&P 500 and Waste Management Index: 2005-2020



Ideal PCM contract structure

PET Bottles

Description: Any whole Polyethylene Terephthalate (#1) bottle with a screw-neck top that contains the A: D7611 "#1, PET or PETE" resin identification code and is clear, transparent green, or transparent light blue bottles should be free of contents or free flowing liq and rinsed.

Product: PET Bottles

Source: Post-Consumer Material

Contamination: Please check with your pet buyer(s) their allowances for:

- Other Colored PET Containers
- PET Thermoforms, e.g., microwave trays, dishes, b trays, deli containers, clam shell conta drink cups

PET Bottle Bale Grade Chart

PET Bale Grade	Grade A	Grade B	Grade C	Grade D
Total PET Fraction by Weight	>94%	93% to 83%	82% to 73%	<73%
Total Amount of Contamination Allowed	6%	7% to 17%	18% to 27%	>27%

PET fraction refers to the total weight of PET bottles in a PET bale, inclusive of caps and labels when still attached to PET containers, as a percentage of the total weight of that bale.
 ** Warehouse applications/onboarding in progress

Contract Specifications

Aluminum Futures		
Product Symbol	ALI	
Venue and Hours (All Times are New York Time/ET)	CME Globex	Sunday – Friday, each day beginning at 18:00 GMT
	CME ClearPort	Monday – Friday, 17:00 GMT – 18:00 GMT
	Open Outcry	Monday – Friday, 17:00 GMT – 18:00 GMT
Contract Size	25 MT	
Price Quotation	USD / MT	
Price Increments	\$0.25 / MT tick size [\$6.25 tick value per contract]	
Daily Settlement	17:00 GMT	
Settlement Type	Physical Delivery	
Brands	CME approved brands	
Storage	Indoor or Outdoor Storage: Ingots, Sows and T-Fe	
Delivery Location**	Delivery locations in the United States	
Delivery Period	Delivery: First business day of the delivery month	
	• Last Trade day – third last business day of the month • Last Notice day – second last business day of the month	
Listed Contracts	CME Globex: 24 consecutive months; ClearPort	

CME Group

Why (not) now?

- Inertia within industry is likely the biggest barrier
- Concentration: both good and bad
- Among majors: opportunity to enhance recycling ops profitability
- Among majors: already familiar with derivatives to hedge risk (e.g. fuel costs)
- Response to societal (and policymaking?) pressures





Thank you!

Questions and comments welcomed

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