Overview of the Dairy Swaps Market

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Swaps

Swaps: Over-the-counter (OTC) instruments for the exchange of cash flows [standard definition]
- "OTC" = <u>not</u> exchange-traded
- "…exchange of cash flows"
  - Hedging involves offsetting cash flows (gains/losses) from cash and futures/options
  - Futures and options trading involves exchange of cash flows (gains/losses) between longs and shorts
  - Swaps involve the exchange of cash flows (gains/losses) between the buyer and seller of the swap

Swaps

Originally designed to "swap" differing cash flows from fixed and floating interest rates

- First swap in 1981 between IBM and World Bank
  - World Bank needed to borrow funds, but US interest rate at the time was 17%
  - Interest rates were lower in Germany (12%) and Switzerland (8%) but World Bank had reached its borrowing limits in both countries
  - IBM had issued bonds in Germany and Switzerland and needed to make payments to bondholders

Swaps

Originally designed to "swap" cash flows from fixed and floating interest rates (cont.)

- …
- IBM and World Bank worked out an arrangement in which the World Bank borrowed dollars in the US and swapped its dollar payment obligations for IBM's German and Swiss payment obligations

- Later on, swaps grew and evolved into customized instruments on many types of assets including currencies and commodities
- Can be used for hedging or speculation, much like exchange-traded futures and options

Swaps

Important features of futures and options:
- All terms are standardized except the price
- Fungible and exchange-traded
- Generally liquid

Important features of swaps:
- Totally customizable; "bespoke"
- Not fungible and traded off-exchange
- Tend to be illiquid

Swaps

Every swap has a *fixed price* and a *floating price* where the floating price is some market price or published price that fluctuates around the fixed price

- One party is the *fixed price payer* (and therefore the floating price receiver)
- The other party is the *floating price payer* (and therefore the fixed price receiver)
- One party often pays a *premium* to the other, depending on the relationship between the fixed and floating prices at the beginning of the swap
- The parties then exchange payments on some predetermined schedule

Swaps

Example 1: Suppose A and B agree to a milk swap, with a fixed price of $17 per cwt. The floating price is currently $16.50 per cwt, the *notional amount* is 1 million cwt, the *tenor* is 5 years, and payments are made every 3 months.
- A is the *fixed price payer*
  - In this case, A expects floating price ↑
- B is the *floating price payer*
  - In this case, B expects floating price ↓
- <u>At the beginning</u>, if A pays $17 to B, and B pays $16.50 to A
  - B would have an immediate gain of $0.50, so…
  - B pays a *premium* of $0.50 (x 1 million) to A

Swaps

Example 2: Suppose A and B agree to a milk swap, with a fixed price of $17 per cwt. The floating price is currently $16.50 per cwt…

- At the end of the first 3-month period, the floating price is $18 per cwt
  - A pays $17 (fixed price) to B
  - B pays $18 (floating price) to A
  - A has a gain of $1 (x 1 million) = net cash flow for first 3 months
  - B has a loss of $1 (x 1 million) = net cash flow for first 3 months

Swaps

<u>Example 3:</u> Suppose A and B agree to a milk swap, with a fixed price of $17 per cwt. The floating price is currently $16.50 per cwt…

- At the end of the second 3-month period, the floating price is $16.75 per cwt
  - A pays $17 (fixed price) to B
  - B pays $16.75 (floating price) to A
  - A has a loss of $0.25 (x 1 million) = net cash flow for second 3 months
  - B has a gain of $0.25 (x 1 million) = net cash flow for second 3 months

Swaps

Example 4: Suppose A and B agree to a milk swap, with a fixed price of $17 per cwt. The floating price is currently $16.50 per cwt…

- At the end of the 5-year swap, the floating price is $16.50 per cwt
  - A pays $17 (fixed price) to B
  - B pays $16.50 (floating price) to A
  - A pays $0.50 (x 1 million) to B = repayment of premium received at the beginning
  - B receives $0.50 (x 1 million) = recovery of premium paid at the beginning

Swaps and Dodd-Frank

Prior to implementation of the Dodd-Frank Act (~2010), swaps differed from futures and options in several important respects
- <u>No</u> daily settlement or mark-to-market
- <u>No</u> margins; one or both parties might (or might not) post collateral with each other
- <u>No</u> margin/collateral calls (as long as both parties maintained their respective credit ratings)
- <u>Not</u> fungible; could be liquidated prior to expiration only by mutual agreement of the buyer and seller
- <u>No</u> offset of opposite positions
- Largely unregulated

Swaps and Dodd-Frank

Today, Dodd-Frank requires swaps to be treated much like futures and options

- Margins and margin calls
- Interim settlements at least once a week
- Position limits and reportable positions, which are coordinated/aggregated with limits on related futures/options wherever possible
- Regulated by CFTC

Swap Data Repositories

Dodd-Frank also requires the reporting of all swaps activity to Swap Data Repositories (SDRs)

- CME, ICE, DTCC, Bloomberg each established an SDR
- Counterparties (buyer & seller) must report the terms of swaps transactions to an SDR
  - Reporting began February 28, 2013 for commodity swaps
- SDRs forward data to CFTC
- CFTC aggregates data and publishes summaries in the CFTC Swaps Report (weekly)
  - Available for most financial swaps
  - Not yet available for swaps on physical commodities

Swap Data Repositories

Dodd-Frank also requires the reporting of all swaps activity to Swap Data Repositories (SDRs)(cont.)

- …

- <u>Can</u> obtain swaps data from each SDR
  - Little consistency in the data from one SDR to another
  - CME provides the most details about individual swaps
  - DTCC has the most swaps but few details
  - ICE is somewhere in between these two extremes
  - Bloomberg has no commodity swaps to date

Swap Data Overview

Dairy Swap Data from CME SDR

- February 28, 2013-February 27, 2015
- 596 individual dairy swaps
  - 102 Butter swaps   51,768,400 lbs
  - 108 Cheese swaps   104,371,000 lbs
  - 45 Class I Milk swaps   38,068,700 cwt
  - 50 Class II Milk swaps   12,819,900 cwt
  - 44 Class III Milk swaps   48,332,500 cwt
  - 136 Class IV Milk swaps   387,408,700 cwt
  - 82 Nonfat swaps   53,894,675 lbs
  - 38 Whey swaps   23,284,335 lbs

Swap Data Overview

Dairy Swap Data from CME SDR

- Notional Amounts (x1,000)

	Avg	Max	Min
Butter swaps (lbs)	508	4,000	2.1
Cheese swaps (lbs)	958	24,000	25
Class I Milk swaps (cwt)	846	7,000	9.7
Class II Milk swaps (cwt)	320	2,000	5.9
Class III Milk swaps (cwt)	1,098	14,000	6.5
Class IV Milk swaps (cwt)	2,849	30,000	2.9
Nonfat swaps (lbs)	657	3,000	0.4
Whey swaps (lbs)	613	6,000	0.1

Swap Data Overview

Dairy Swap Data from CME SDR (cont.)

- All expire on last calendar day of the month

Tenor (days)	Avg	Max	Min
Butter swaps	182	455	27
Cheese swaps	150	364	27
Class I Milk swaps	116	364	29
Class II Milk swaps	115	364	29
Class III Milk swaps	124	364	29
Class IV Milk swaps	109	364	29
Nonfat swaps	186	455	30
Whey swaps	74	364	26

Swap Data Overview

Dairy Swap Data from CME SDR (cont.)

- All denominated in US$
- Payment frequency (all 596 swaps)
  - 1 month: 131 (22%)
  - 2 months: 42   (7%)
  - 3 months: 114 (19%)
  - 4 months: 10   (2%)
  - 5 months: 7   (1%)
  - 6 months: 59 (10%)
  - 9 months: 9   (2%)
  - 12 months: 36   (6%)
  - At maturity:188 (31%)

Swap Data Overview

Dairy Swap Data from CME SDR (cont.)

- All are uncleared

- None have embedded option features

- Wide variety of Floating Price sources
  - Butter
    - AMS CLASS AND COMPONENT
    - AVG OF CME AA CASH BUTTER MKT WE 3RD FRI 2 MO PREV
    - MONTHLY AVG PRICE OF CME CASH BUTTER MARKET
    - NASS FINAL BUTTER
    - NASS FINAL CLASS II BUTTERFAT

Swap Data Overview

Dairy Swap Data from CME SDR

- …
- Wide variety of Floating Price sources (cont.)
  - …
  - Cheese
    - WEEKLY AVG PRICE OF CME CASH BARREL CHEESE MARKET
    - WEEKLY AVG PRICE OF CME CASH BLOCK CHEESE MARKET
    - MONTHLY AVG PRICE OF CME CASH BLOCK CHEESE MARKET
    - AMS CLASS AND COMPONENT

Swap Data Overview

Dairy Swap Data from CME SDR

- …
- Wide variety of Floating Price sources (cont.)
  - …
  - Milk – Class I, Class II, Class IV
    - AMS CLASS AND COMPONENT
  - Milk – Class III
    - AMS CLASS AND COMPONENT
    - NASS FINAL CLASS III 3.5% BUTTERFAT PRICE

Swap Data Overview

Dairy Swap Data from CME SDR

- …
- Wide variety of Floating Price sources (cont.)
  - …
  - Nonfat
    - AMS CLASS AND COMPONENT
    - NASS ADVANCE CLASS II NONFAT SOLIDS
    - NASS ADVANCE CLASS II SKIM MILK
    - NASS ADVANCE NONFAT DRY MILK
  - Whey
    - AMS CLASS AND COMPONENT
    - NASS FINAL DRY WHEY

Summary

Based on dairy swap data from CME SDR:

- Swaps tend to be fewer in number but substantially larger in size, relative to futures and options

- Tenor (lifespan) ranges from 1 month to 1 year/5 quarters

- Payment frequency ranges from monthly to only at maturity

- Wide variety of floating price sources, mostly USDA

- Industry uses customization to fine-tune swaps and reduce basis risk

Thank you!

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