The Case for a Hedge Exemption From the Mandatory Clearing of Derivatives

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May 27, 2010

Goals for the Reform of Derivatives Trading

- Reform is in process, with the final form in negotiations.
- 3 key goals:
  - Put all derivative transactions under regulatory supervision.
  - Increase the transparency of the market through reporting of transactions.
  - Increase clearing of transactions.
- My focus today is on the issue of clearing.

Objective

- Maintained Hypothesis:
  - Some kind of financial reform is going to get passed.
  - Some kind of derivatives clearing requirement is going to be included.
  - Some kind of hedge exemption is going to be included.
  - Feel free to object on any of these. I consider politics to be “the only adult sport”, and over the years I’ve seen many things happen. So I’m not ready to make predictions. But this is the premise for the rest of the talk.
  - Whatever language is passed, there will be a long period in which the actual regulations and practices will be worked out, revised, amended, evolve. How will we be guided in that practice?
- Objective: Economic Modeling for a Hedge Exemption
  - Should there be a hedge exemption?
  - For which traders & transactions?
  - How can clearing be improved, made less costly?

Outline

- End-Users’ Argument
- Critique
  - A Positive Model of Hedging and Liquidity
  - Foundation for Discussion: a simple example
  - Critique of the Hedge Exemption: replication argument
- Alternative Agenda for Defining an Appropriate Hedge Exemption

The End-User Argument

A Hedge Exemption?

- End-users have demanded an exemption from the clearing requirement for their legitimate hedging operations. Clearing should be required of dealers, not end-users.
- 3 main arguments.
  - The financial crisis didn't originate with end-user hedging. Don't go messing up parts of the financial system that aren't broken. Fix the ones that are broken. That's not us.
  - Clearing requires standardization of contracts. Hedgers need custom tailored terms – e.g., delivery locations, delivery dates, etc. Forcing clearing will reduce the available contracts and obstruct hedging.
  - Clearing requires posting margin. Current OTC swaps are often offered without margin requirements. The posting of margin is costly, draining corporate liquidity, increasing financing costs, making hedging costly.
- My focus is on this last one, clearing & margins.

The End-User Testimony

"While we are mindful of the reduction in credit risk inherent in a clearing or exchange environment, robust margin requirements would create substantial incremental liquidity and administrative burdens for commercial users, resulting in higher financing and operational costs. Capital currently deployed in growth opportunities would need to be maintained in a clearinghouse. This could result in slower job creation, lower capital expenditures, less R&D and/or higher costs to consumers. …

By imposing initial and variation margin requirements, clearinghouses will add significant capital requirements for end users, adding significant costs, discouraging hedging, and diverting scarce capital that could otherwise be used in further growing American businesses."

Timothy Murphy, FX Risk Manager, 3M Corporation
House Financial Svcs Subcomm on Capital Markets
June 9, 2009

For example,

- 3M
- Cargill
- Delta & ATA
- John Deere
- NSGA, AGA
- APPA, EEI
- US Chamber of Commerce, Business Roundtable, etc.

and a similar reaction in Europe, culminating in

- European Association of Corporate Treasurers

Typical End-User Illustration

- "Large Electric Power Company" as provided by the Edison Electric Institute and the Electric Power Supply Association
- Assume that in 2009 an electric power supplier seeks to enter into a fixed price power supply agreement with a utility for 300 MW in 2012.
  - On exchange (i.e. cleared), the power supplier would first have to meet a 5% initial margin. Assuming a $50/MWh market price, the power supplier would have to put up $6.6 million dollars of initial margin.
    - $6.6 million = 300 MW x 8760 hours x $50/MWh x 5%
    - @5% interest ≈ $1 million
  - On exchange would require $72.6 million credit facility for the margin requirements.
    - @ cost of $1.1 million
  - On exchange, in event of price fall of 50%, "an additional $8 million in interest expense would be incurred, adding $3.10/MWh.
  - Total cost, $3.95/MWh. Adds 5-15% to cost.

Typical End-User Illustration (cont.)

- Under the current system, OTC without clearing…
  - Power supplier is extended an unsecured line of credit of about $20 million.
  - Hedge requires a $25 million line to secure this transaction. Therefore the power supplier needs to post $5 million up front.
  - Power supplier also trades natural gas. Natural gas positions are worth $7.5 million. These are an offset to the $25 million in security required. Net requirement is $17.5 million, which is below the $20 million unsecured line of credit.
- As in all of the end-user examples, the fates conspire to eliminate the need for any margining of an OTC swap without clearing.
- The incremental cost of a clearing requirement always equals
  - (i) the margin, under a system with clearing,

  minus
  - (ii) zero, the cost under the current system.

Estimating the Aggregate Cost: NGSA $900 billion, now $600+ billion

Initial Margin:

- Total notional OTC derivatives outstanding, year end '09: $615 trillion.
- of which 30% are US: $184 trillion.
- of which 0.5% are commodities: $922 billion.
- Apply a 15% margin: $138 billion.

Variation Margin:

- Total gross credit exposure on OTC derivatives outstanding year end '09: $3.520 trillion.
- of which 30% are US: $1.056 trillion.
- of which, 50% are collateralized: $528 billion uncollateralized credit exposures.

Total new margin required = $138 + $528 = $666 billion.

Compare to $0 cost for unmargined OTC swaps.

Net increase in margin is $666 billion

Source: NGSA calculation back-up provided by NGSA. Total notional OTC derivatives outstanding and gross credit exposure are BIS data. The % calculated for commodities is also BIS data, and exclude gold. Other assumptions are by NGSA.

Quibbles with the details of the calculation

- Initial margin.
  - Uses the gross notional amounts.
  - Margins would typically, if not always, be required on net counterparty exposures. Counterparty netting significantly reduces the total amount: down to 15%.
  - Clearing further reduces gross exposures by canceling offsetting positions held by one end-user with different counterparties.
    - Illustrated in the CDS market with Fed's efforts at portfolio compression since January 2008.
- Variation margin.
  - Same comments about offsetting exposures.
  - Comparing apples to oranges. These are accrued assets and liabilities. Like comparing futures and forwards.
- One calculation focuses on only commodities, the other doesn't. The inconsistency reflects the flaws in the underlying logic.

Asset class	Exposure ($ billions)
Credit default swap	2,987
Interest Rate	15,478
Equity Linked	879
Foreign Exchange	2,470
Commodity	689
Unallocated	2,868
Total	25,372
Total after netting	3,744

Source: BIS, data for June 2009. Taken from Duffie (2010a).

"Since January 2008, nearly $50 trillion in notional CDS positions have been eliminated from the market through portfolio compression, reducing the total notional amount of outstanding CDS positions from a peak of over $60 trillion to a current level of about $26 trillion, after allowing for additional trading in the interim."

Source: Duffie (2010b).

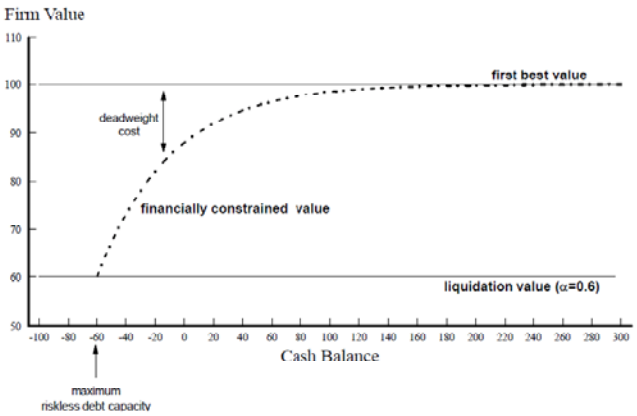
Estimating the Aggregate Cost: Business Roundtable $5-6 billion cut in capex

- $1,104 billion in gross notional at large companies
  - survey results extrapolated
- 3% margin translates to $33.1 billion cash call
- Cash constraints force a decline in capex
  - every 1 percentage point decline in the operating cash flow to net capital ratio causes a 0.06 percentage point decline in capex
  - $5-6 billion
- PR says this is an annual cut, but in fact it is just a one-time cut.

Analysis & Critique

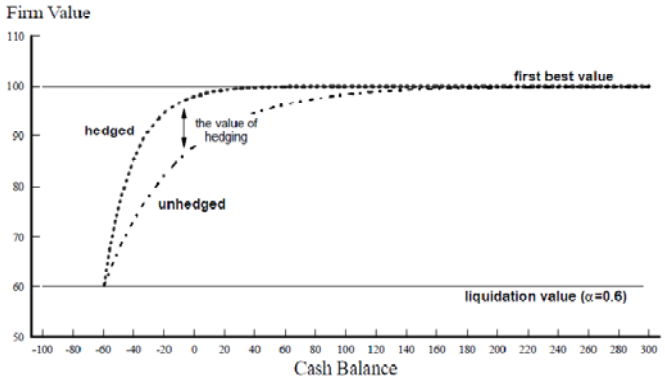
A Model of Hedging and Liquidity

- Mello & Parsons (2000), Hedging and Liquidity, *Review of Financial Studies*.
- Analyzes a cash constrained firm.
  - Extreme case: only outside cash available is riskless debt.



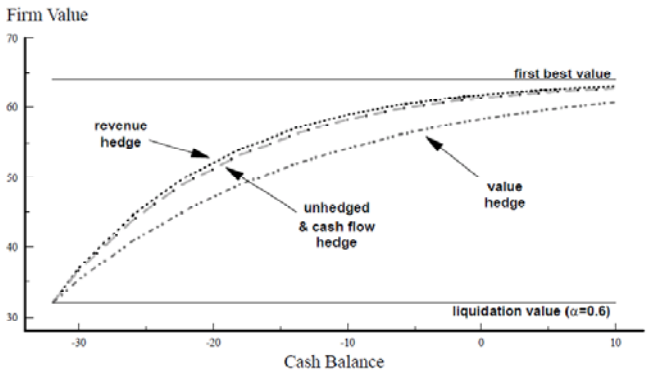
The Value of Hedging

- Futures are available on one risk factor. A second risk factor is unhedgable.
  - Equivalent to hedging with basis risk.
- On the margin, some hedging is clearly valuable. Hedging preserves the firm's cash balances, keeping it away from financial distress.



Liquidity Constraints Also Limit the Size of the Optimal Hedge

- A value hedge is not optimal. It eats up too much liquidity.
  - Hedge is marked-to-market, so that there is an immediate cash consequence to hedging long horizon cash flows.
  - Does a hedge provide its own liquidity? NO.
  - Eating up near term liquidity can be more damaging than the benefit of reducing the long-horizon uncertainty on cash flow.



Application to Margining

- Liquidity is expensive, so margin is costly.
- Alternative ways to finance margin or, equivalently, to finance hedging can be advantageous.
  - Model only allowed riskless debt. This maximizes the cost to the mark-to-market cash flow consequences of hedging, and maximizes the cost of margining a hedge.
  - Risky debt is a preferred substitute for financing margin.
    - A model with risky debt would have a looser financing constraint and higher firm value. Otherwise the structure of the model remains the same.
    - The availability of risky debt makes hedging less costly, loosening the constraint on using hedging. The optimal hedge ratio will be larger. Otherwise, results stay the same. On the margin, the tradeoff between the advantage of reducing cash flow volatility at all horizons and eating up near term liquidity remains.
  - Extending the model is straightforward in principle, but difficult in practice.
    - The strategy space expands enormously. Problems of seniority and maturity of different issues of debt multiply the calculation complexity.

Evaluating a Case for a Hedge Exemption

- The issue at hand is not whether hedging is expensive, but rather whether hedging under one set of rules is more expensive than hedging under another set of rules.
- Any system must specify how accrued losses on a hedge are going to be financed.
- Any system for financing accrued losses on a hedge is going to incur a liquidity cost.
- Is there an essential distinction between how the two systems finance accrued losses?
  - If so, what is it?
  - How does this minimize on liquidity costs?

Foundation for Discussion: A Simple Example

Assumptions for the Example

- Hedger purchasing crude oil.
  - E.g., an airline, except that I abstract from basis risk across products (jet fuel vs. crude oil)
- Evaluate a purchase for delivery at a single date.
  - Avoid rolling a complete strip over time and manipulating the full term structure. Results obviously carry, with minor housekeeping for the strip.
  - Today: November ’10.
  - Delivery/Maturity: February ’11.
  - Current price of the Feb11 contract is $82/bbl
  - Settlement is in cash. Ignore issue of the closing date for the contract and delivery through the month.
- Scenario analysis.
  - #1 prices fall. Hedge makes a loss.
  - #2 prices rise. Hedge makes a gain.
- Alternative market instruments:
  - An exchange traded (cleared) contract. 15% initial margin, 15% maintenance margin.
  - An OTC swap without margin. Assume the same pricing.
- Evaluation: Compare net cash flow patterns.
  - Ignore interest payments over this horizon, and interest rate risk.
- Replicate the OTC swap cash flow using an exchange traded (cleared) contract.

Scenario #1: Term Structure Decreases by $1 Each Month, (parallel shifts down)

	Nov 10	Dec 10	Jan 11	Feb 11
Feb11 contract price	82.00	81.00	80.00	79.00

Cleared/Margined Futures Contract

period	0	1	2	3	
date	Nov 10	Dec 10	Jan 11	Feb 11	total
gains/loss		-10.0	-10.0	-10.0	-30.0
initial margin	-123.0				-123.0
maintenance margin		-8.5	-8.5	110.0	93.0
margin balance	123.0	121.5	120.0	0.0	
ncf	-123.0	-8.5	-8.5	110.0	-30.0

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OTC Swap, no margin

period	0	1	2	3	
date	Nov 10	Dec 10	Jan 11	Feb 11	total
ncf (swap receipt/payment)		0.0	0.0	-30.0	-30.0
unrealized gain/loss		-10.0	-20.0	0.0	

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Replication

- An un-margined OTC swap is a package of 2 products:
  - #1. A cleared futures contract.
  - #2. A contingent credit line.

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OTC Swap, no margin

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date	Nov 10	Dec 10	Jan 11	Feb 11	total
ncf (swap receipt/payment)		0.0	0.0	-30.0	-30.0
unrealized gain/loss		-10.0	-20.0	0.0	

Cleared/Margined Futures Contract, with a contingent credit line

period	0	1	2	3	
date	Nov 10	Dec 10	Jan 11	Feb 11	total
gains/loss		-10.0	-10.0	-10.0	-30.0
initial margin	-123.0	0.0	0.0	0.0	-123.0
maintenance margin	0.0	-8.5	-8.5	110.0	93.0
margin balance	123.0	121.5	120.0	0.0	
credits/payments	123.0	8.5	8.5	-140.0	0.0
debt balance	123.0	131.5	140.0	0.0	
ncf	0.0	0.0	0.0	-30.0	-30.0

Scenario #1: Term Structure Decreases by $1 Each Month, (parallel shifts down)

	Nov 10	Dec 10	Jan 11	Feb 11	
Feb11 contract price	82.00	81.00	80.00	79.00	

Cleared/Margined Futures Contract

period	0	1	2	3	
date	Nov 10	Dec 10	Jan 11	Feb 11	total
gains/loss		-10.0	-10.0	-10.0	-30.0
initial margin	-123.0				-123.0
maintenance margin		-8.5	-8.5	110.0	93.0
margin balance	123.0	121.5	120.0	0.0	
ncf	-123.0	-8.5	-8.5	110.0	-30.0

OTC Swap, no margin

period	0	1	2	3	
date	Nov 10	Dec 10	Jan 11	Feb 11	total
ncf (swap receipt/payment)		0.0	0.0	-30.0	-30.0
unrealized gain/loss		-10.0	-20.0	0.0	

Cleared/Margined Futures Contract, with a contingent credit line

period	0	1	2	3	
date	Nov 10	Dec 10	Jan 11	Feb 11	total
gains/loss		-10.0	-10.0	-10.0	-30.0
initial margin	-123.0	0.0	0.0	0.0	-123.0
maintenance margin	0.0	-8.5	-8.5	110.0	93.0
margin balance	123.0	121.5	120.0	0.0	
credits/payments	123.0	8.5	8.5	-140.0	0.0
debt balance	123.0	131.5	140.0	0.0	
ncf	0.0	0.0	0.0	-30.0	-30.0

#1

Scenario #1: Term Structure Decreases by $1 Each Month, (parallel shifts down)

	Nov 10	Dec 10	Jan 11	Feb 11	
Feb11 contract price	82.00	81.00	80.00	79.00	
Cleared/Margined Futures Contract					
period	0	1	2	3	
date	Nov 10	Dec 10	Jan 11	Feb 11	total
gains/loss		-10.0	-10.0	-10.0	-30.0
initial margin	-123.0				-123.0
maintenance margin		-8.5	-8.5	110.0	93.0
margin balance	123.0	121.5	120.0	0.0	
ncf	-123.0	-8.5	-8.5	110.0	-30.0
OTC Swap, no margin					
period	0	1	2	3	
date	Nov 10	Dec 10	Jan 11	Feb 11	total
ncf (swap receipt/payment)		0.0	0.0	-30.0	-30.0
unrealized gain/loss		-10.0	-20.0	0.0	
Cleared/Margined Futures Contract, with a contingent credit line					
period	0	1	2	3	
date	Nov 10	Dec 10	Jan 11	Feb 11	total
gains/loss		-10.0	-10.0	-10.0	-30.0
initial margin	-123.0	0.0	0.0	0.0	-123.0
maintenance margin	0.0	-8.5	-8.5	110.0	93.0
margin balance	123.0	121.5	120.0	0.0	
credits/payments	123.0	8.5	8.5	-140.0	0.0
debt balance	123.0	131.5	140.0	0.0	
ncf	0.0	0.0	0.0	-30.0	-30.0

#2

Scenario #1: Term Structure Decreases by $1 Each Month, (parallel shifts down)

	Nov 10	Dec 10	Jan 11	Feb 11	
Feb11 contract price	82.00	81.00	80.00	79.00	
Cleared/Margined Futures Contract					
period	0	1	2	3	
date	Nov 10	Dec 10	Jan 11	Feb 11	total
gains/loss		-10.0	-10.0	-10.0	-30.0
initial margin	-123.0				-123.0
maintenance margin		-8.5	-8.5	110.0	93.0
margin balance	123.0	121.5	120.0	0.0	
ncf	-123.0	-8.5	-8.5	110.0	-30.0
OTC Swap, no margin					
period	0	1	2	3	
date	Nov 10	Dec 10	Jan 11	Feb 11	total
ncf (swap receipt/payment)		0.0	0.0	-30.0	-30.0
unrealized gain/loss		-10.0	-20.0	0.0	
Cleared/Margined Futures Contract, with a contingent credit line					
period	0	1	2	3	
date	Nov 10	Dec 10	Jan 11	Feb 11	total
gains/loss		-10.0	-10.0	-10.0	-30.0
initial margin	-123.0	0.0	0.0	0.0	-123.0
maintenance margin	0.0	-8.5	-8.5	110.0	93.0
margin balance	123.0	121.5	120.0	0.0	
credits/payments	123.0	8.5	8.5	-140.0	0.0
debt balance	123.0	131.5	140.0	0.0	
ncf	0.0	0.0	0.0	-30.0	-30.0

The two cash flow patterns are identical.

Scenario #2: Term Structure Increases by $1 Each Month, (parallel shifts up)

	Nov 10	Dec 10	Jan 11	Feb 11	
Feb11 contract price	82.00	83.00	84.00	85.00	

Cleared/Margined Futures Contract

period	0	1	2	3	total
date	Nov 09	Dec 09	Jan 10	Feb 10	
gains/loss		10.0	10.0	10.0	30.0
initial margin	-123.0				-123.0
maintenance margin		8.5	8.5	136.0	153.0
margin balance	123.0	124.5	126.0	0.0	
ncf	-123.0	8.5	8.5	136.0	30.0

OTC Swap, no margin

period	0	1	2	3	
date	Nov 09	Dec 09	Jan 10	Feb 10	
ncf (swap receipt/payment)		0.0	0.0	30.0	30.0
unrealized gain/loss		10.0	0.0	0.0	

Cleared/Margined Futures Contract, with a contingent credit line

period	0	1	2	3	
date	Nov 09	Dec 09	Jan 10	Feb 10	
gains/loss		10.0	10.0	10.0	30.0
initial margin	-123.0	0.0	0.0	0.0	-123.0
maintenance margin	0.0	8.5	8.5	136.0	153.0
margin balance	123.0	124.5	126.0	0.0	
credits/payments	123.0	-8.5	-8.5	-106.0	0.0
debt balance	123.0	114.5	106.0	0.0	
ncf	0.0	0.0	0.0	30.0	30.0

Something for Nothing

- In the numerical example, Scenario #1, when prices move against the end-user/hedger, a liability accrues from the end-user to the dealer.
  - This is a loan from the dealer to the end-user.
  - The size of the loan is determined by the movements in the term structure.
- A swap negotiated without a margin entails a contingent credit exposure.
  - Dealers anticipate this possibility and ex ante evaluate the likely exposure. The dealer's trader cannot enter into the swap unless its internal credit authority approves the exposure.
- Dealers charge for the contingent credit exposure. It is in the bid-ask terms of the deal.
  - Bid-ask terms change with the credit quality of the counterparty, for example.
  - A margined OTC swap will have tighter bid-ask terms than an un-margined OTC swap.
- Advocates for a hedge exemption assume that this contingent credit exposure is granted for free.
- Advocates position is comparable to a home buyer thinking that they are paying nothing to the mortgage originator when the points are rolled into the mortgage interest rate

Something for Nothing (2)

- Historical record reports important cases when the financing costs of trading have been underestimated dramatically because costs were not explicitly billed.
  - Trading units in electric power & natural gas companies pre-California and pre-Enron.
    - Mirant, Dynegy, Williams, El Paso, Aquila
  - The trading units of these companies only appeared profitable because they operated on the balance sheet of a larger company with hard assets. The trading unit leaned on this larger balance sheet, avoiding putting up collateral, but forcing the larger company to maintain a higher credit rating than is necessary for the other lines of business. This cost was not charged specifically to the trading unit.
  - Events surrounding the collapse of Enron forced the trading units to be re-evaluated. The costs of maintaining the higher credit rating were suddenly directly attributable to trading. In almost all cases the units suffered under this re-evaluation. Suddenly the former profits appeared inadequate to justify maintaining these divisions.

The Financing Options are Identical Under a Cleared System – Liquidity Costs the Same

- My claim: Any and all benefits of offering an un-margined OTC swap can be produced in a system with mandatory clearing.
- The un-margined OTC swap offers the two products as a seamless package. A requirement for clearing simply forces the two products to be offered independently.
- Mandatory clearing cannot increase the financing costs of end-user hedges.
  - Whatever is the price charged for the embedded contingent credit line in the un-margined OTC swap…
  - the same price makes sense for the explicit contingent credit line associated with the cleared futures contract.
- The replication argument is a very, very strong one.
  - The replication is valid for all sample paths, not just on average.
  - It does not rely on any pricing or equilibrium assumptions. It makes no assumption about the objectives of hedging, nor about the financial statements of the end-user.
  - In a model with limited liquidity – like the one described above – the optimal hedge ratio is the same whether the futures positions require margins or not.

Second Order Effects?

- Are there institutional considerations that obstruct dealers from offering the unbundled products?
  - Do bank regulations treat credit risk accumulated on swaps differently from credit risk on the loan portfolio?
  - Accounting treatment?
- This suggests a positive agenda for addressing end-user/hedger concerns.
  - The clearing mandate is a red herring, or at least not the essential issue.
  - Start finding the real obstacles to rational financial products and address them.

Macro / Systemic Considerations

- The replication argument applies between a single end-user and a single dealer, taking the marketplace as given and the risk of the individual transaction as given, including the credit risk.
- The objective of clearing is to reduce systemic risk.
  - Aggregate credit risk can be smaller when individual positions are netted against one another.
  - The risk of a 'run' can be reduced by clearing, among other tools.
- These considerations argue against any end-user or hedging exemption.
  - At the micro level, any perceived benefit is entirely illusory.
  - At the macro level, this undermines the effort to reduce aggregate credit risk in the system, raising the cost of hedging for all.
- A positive agenda for macro / systemic considerations should focus on assuring that the potential benefits of reducing credit risk and systemic risk are realized.
  - For example, clearing reduces aggregate credit risk only if a sufficiently large number of participants utilize the same clearinghouse. Fragmented clearing may increase aggregate credit risk.
  - Manage the tradeoff between the benefits of clearing and other factors, such as the need for customized instruments and financial innovation.

The End