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Timothy B. Michael, Editor
University of Houston-Clear Lake

Robert Stretcher, Editor Emeritus
Sam Houston State University

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Those interested in subscribing to, advertising in, or submitting manuscripts to the Journal, as well as other communication, should contact the editor.

Dr. Timothy B. Michael, Editor
Journal of Finance Case Research
College of Business
University of Houston-Clear Lake
2700 Bay Area Blvd, Box 204
Houston, Texas 77058
(281) 283-3193
michael@uhcl.edu

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Letter from the Editor

I am pleased to present the *second* 2021 issue of the *Journal of Finance Case Research*, the official journal of *The Institute of Finance Case Research* (IFCR). With the pandemic, 2020 and 2021 have been difficult years for the journal and the Institute. Our senior editor, Bob Stretcher, along with numerous associate editors and reviewer volunteers have contributed a great deal of time and energy to keep things moving forward. I have also benefitted from the patience and support of our submitting author community.

The IFCR provides an avenue for the writing of cases and their submission for peer review. Cases accepted for publication in the *Journal* have met the quality requirements of a double-blind review process, and they are available for use through *Journal* subscriptions or by contacting the *Institute* for electronic copy access. Teaching notes are available to instructors desiring to use each case by contacting either the *Institute* or the authors.

The *Institute* continues to promote the interaction of case writers in conference settings. I invite case writers and case users to participate in the activities of the *Institute*. Our case sessions are held at a variety of finance conferences and provide the opportunity for interaction with others with a similar interest. Our recent conference activities have taken place in Fort Lauderdale, San Antonio, Charleston, Denver, Savannah and other popular destinations. Cases submitted for conference presentation are eligible for the review process for the *Journal*, and we have collaborated with different conferences (such as Financial Education Association) on special issues in the past.

Our overall objective is to create an outlet for case writers, and to build a source of quality cases for case users. Cases presented at our conferences, having had the advantage of being exposed to the scrutiny of experienced casewriters, have a better chance of final acceptance for journal publication.

Our acceptance rate is never more than 25%. The *Journal* is listed in *Cabell's Directory of Publishing Opportunities in Economics and Finance*, and it is also on the Australian Business Deans' Journal Quality List.

This issue of the *Journal of Finance Case Research* contains several cases that we hope you will find useful in your courses and consulting work. Please visit our Web site often for updates and conference information. We encourage all parties interested in the production, promotion, and use of cases in finance to become active participants in the IFCR.

Timothy B. Michael, Editor
Journal of Finance Case Research
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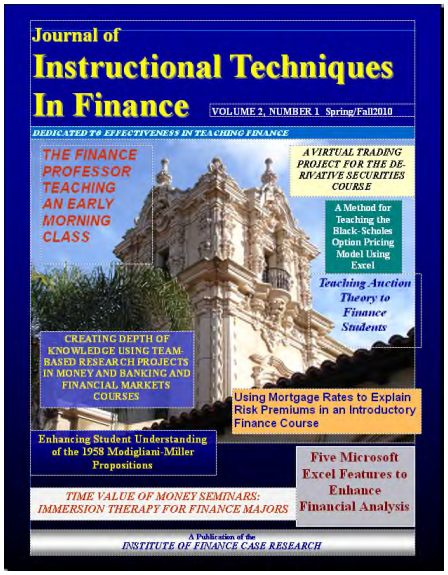


Journal of Instructional Techniques in Finance

CALL FOR PAPERS

The *JITF* invites authors to submit manuscripts for publication consideration. The *JITF* is a periodical double-blind refereed journal which began in the Fall of 2008. The *JITF* seeks articles concerning innovative and effective teaching techniques, tools for educators, and especially techniques designed to enhance the student experience in finance courses at the college level. The *JITF* is designed to be useful to finance professors wanting to create better understanding of financial methodologies and analyses among their students. If you have used techniques that have helped you achieve this, please consider formally sharing it through our *JITF* venue.

We recommend formatting submissions according to the required *Guidelines for Authors* on our website. Although submissions in any format are considered for conferences, the presumption is that journal publication is the ultimate objective of a submission. If formatted correctly, one less editorial requirement stands in the way of effective revisions.

A *publication fee* of $57.00 per paper is required upon final acceptance of cases for publication in the *JITF*. If a manuscript is accepted for publication, all listed authors must either be *IFCR* members, or must submit the subscription fee prior to publication. Our operations are supported wholly by membership, subscription, and publication fees. We receive no support from universities or conferences.

We sincerely hope the *JITF* can serve your academic publishing needs. Our contact information:

Dr. Mary Funck, Editor
Journal of Instructional Techniques in Finance
Department of General Business and Finance
Sam Houston State University
Huntsville, TX 77341
(936) 294-1283
mcf012@shsu.edu

THE EFFECT OF GEOPOLITICAL RISK ON COMMODITIES: RUSSIA'S INTERVENTION IN UKRAINE

Austin Damiani and Ameeta Jaiswal-Dale
University of St. Thomas

INTRODUCTION

This case provides an opportunity to discuss the role of geopolitics on a major global agricultural product, wheat. The global nature of the market for wheat is best represented via the derivative market and the futures contract. The Chicago Mercantile Exchange (CME) / Chicago Board of Trade (CBOT) soft red winter (SRW) wheat futures market is discussed in this case due to its global use as a benchmark and because it serves as an excellent barometer for early and rapid price discovery.

Food and agricultural production is a basic human necessity. The economic realities of food production, distribution, and consumption are affected by myriad factors, among them price fluctuations. These price fluctuations are a consequence of the influence of elements such as climate, government policies, population trends, and geopolitical events that impact the agricultural industry and related businesses.

The case is presented in the following format: Details of the geopolitical event are presented. Then pre- and post-event market conditions in SRW wheat futures are detailed; the event's effects on different categories of players in this market are outlined for discussion and analysis; and a conclusion follows.

GEOPOLITICAL EVENT

Russia’s military intervention and subsequent annexation of Ukraine’s Crimean Territory in the spring of 2014 disrupted global financial markets and exemplifies that both speculators and hedgers in commodity markets are subject to the risks of geopolitical events. The wheat market demonstrates the impact of geopolitical events on futures prices, option pricing, term structure, open interest, and supply and demand fundamentals. At the time of these events, Ukraine was the world’s 3rd largest exporter of corn and 6th largest exporter of wheat.

The Event

The Ukrainian Revolution of 2014, also known as the Euromaiden Revolution, transpired in February 2014. In late 2013, President Yanukovych was in trade talks with the EU toward a bailout package for Ukraine in exchange for liberalizing reforms that would more closely associate Ukraine with the EU and therefore distance Ukraine from its historical reliance on Russia. On the

eve of signing the agreement, President Yanukovych abruptly refused. Widespread protests erupted, and they intensified after Yanukovych accepted a bailout package from Russia and simultaneously began cracking down on protests with government riot police. Violent clashes ensued between protesters and government security forces. President Yanukovych was ultimately ousted and he fled to Russia. A series of reforms were launched and new elections were organized. European and American counterparts supported the Euromaiden Revolution as a democratic moment, while Russia labeled it a violent and illegal coup. Russia supported separatist insurgents in eastern Ukraine and launched a swift military intervention in the Crimean Peninsula, resulting in its complete annexation and absorption into Russia by March 19th, 2014. This action was widely condemned and resulted in Russia's suspension from the G8 and the institution of multilateral sanctions by the US, the EU, and Canada.

Pre-event

Leading up to the events in Ukraine, U.S. wheat futures prices were in a bear market, trending lower for three consecutive months, from late October 2013 through the end of January 2014, as world wheat production prospects improved following a bumper Canadian harvest. This period was marked by steadily declining prices and rising open interest in benchmark CBOT wheat futures. The peak-to-trough price decline for the nearby CBOT wheat futures was 17.6%, irrespective of rolls. CBOT SRW wheat open interest rose 21% during the same timeframe, consistent with rising short exposure by trend-following speculative funds.

February 2014 saw constructive trade with an 8% jump in prices for the month, almost retracing the losses of the month prior. This price appreciation was accompanied by speculative deleveraging resulting in rapidly declining open interest totaling 83,000 contracts, or 19% of January's month-end figure.

Commodity Futures Trading Commission (CFTC) data indicates that managed futures funds held 155,000 contracts of short open interest in CBOT wheat futures as of January 28th, 2014.[1] CFTC data also indicates that this aggregate position declined to 105,000 by February 25th, 2014. It is noteworthy that speculative deleveraging was already in process when the Ukraine conflict escalated to a full military invasion of the Crimea Peninsula in the early days of March 2014. Grain markets began trading on March 3rd, 2014, with a gap higher opening and finished the day sharply higher following the events of the weekend prior, which brought the military escalation of the Ukraine conflict to the front and center of the news cycle. The May2014 SRW contract settled trading $0.2925 higher per bushel on March 3rd, 2014, for a gain of nearly 5%.[2]

The possibility of trade disruption to grain exports in such a critical region triggered widespread buying in grain futures markets that would continue for weeks. The speculative deleveraging of short positions that was already in process in the wheat market in February

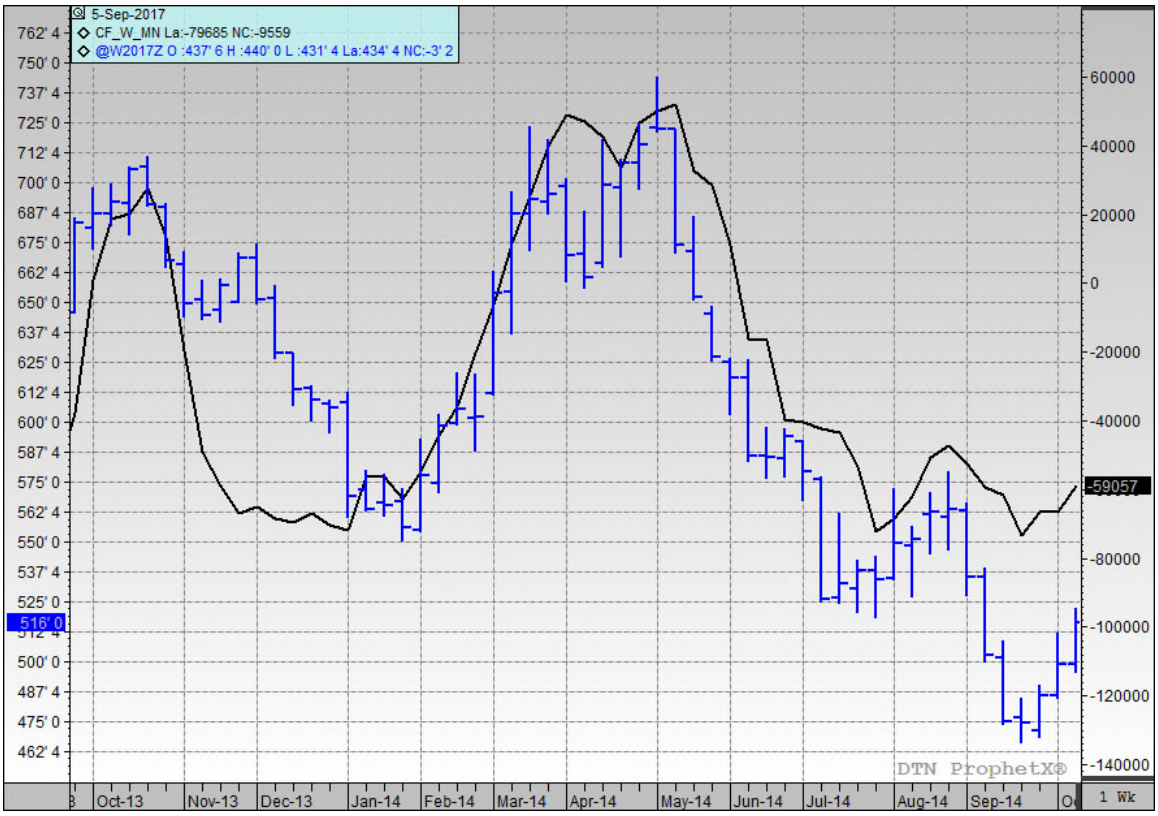
[1] CFTC designation: "A "money manager," for the purpose of this report, is a registered commodity trading advisor (CTA); a registered commodity pool operator (CPO); or an unregistered fund identified by CFTC.7. These traders are engaged in managing and conducting organized futures trading on behalf of clients."
<http://www.cftc.gov/MarketReports/CommitmentsofTraders/DisaggregatedExplanatoryNotes/index.htm>

[2] All prices are taken from the DTN terminal.
https://www.dtnpf.com/agriculture/web/ag/markets/futures

accelerated as a technical uptrend developed and new buyers came to the market in response to the news cycle.

March 2014 would see a dramatic rally with nearby CBOT wheat futures surging $0.95 per bushel for a gain of 16%. Open interest saw only a marginal increase, but the composition of open interest changed dramatically. The aggregate position of managed futures funds as of February 25th, 2014, was still net short approximately 20,000 contracts and by April 1st, 2014, this aggregate position had risen to net long 49,000 contracts. Figure 1 illustrates the tight correlation between the managed futures net position (Black Line) and the nearby CBOT wheat futures weekly closing price (Blue Bar).

Figure 1. Wheat Futures



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Post Event

As the Ukraine Crisis and the fear of trade disruptions in the Black Sea shipping district dominated the news cycle, SRW prices continued to trend higher for the first three weeks of March. An interim high was achieved on March 20th, 2014, at an intraday price of $7.23 1/2 per bushel--a monthly gain of $1.21 1/4 per bushel, a full 20% higher than February's month-end closing price.

Prices subsequently eased lower but geopolitical tensions in the Black Sea region and the ongoing military conflict in Ukraine continued to inform price volatility in wheat futures through

the months of April and May. SRW prices seasonally peaked on May 6th, 2014, after which the market began trending lower. By early June 2014, prices had completely retraced to levels not seen since February 2014.

Actual trade disruptions from the conflict proved to be minimal, and USDA estimates of world wheat trade, in fact, grew between the February 2014 and the May 2014 World Agricultural Supply and Demand Estimates (WASDE) reports. A summary of these USDA-World Agricultural Outlook Board projections from February 10th, 2014, and May 9th, 2014, indicate only minor impacts to the wheat trade in Ukraine and Russia over the relevant timeframe. Later and more thorough crop year estimates published in the December 10th, 2014, WASDE report indicate that only minor adjustments occurred after the May report, suggesting little or no substantive issues with the May projections (as is also suggested by the decline in wheat futures prices from May to September 2014.)

Table 1. World Agricultural Supply and Demand Estimates

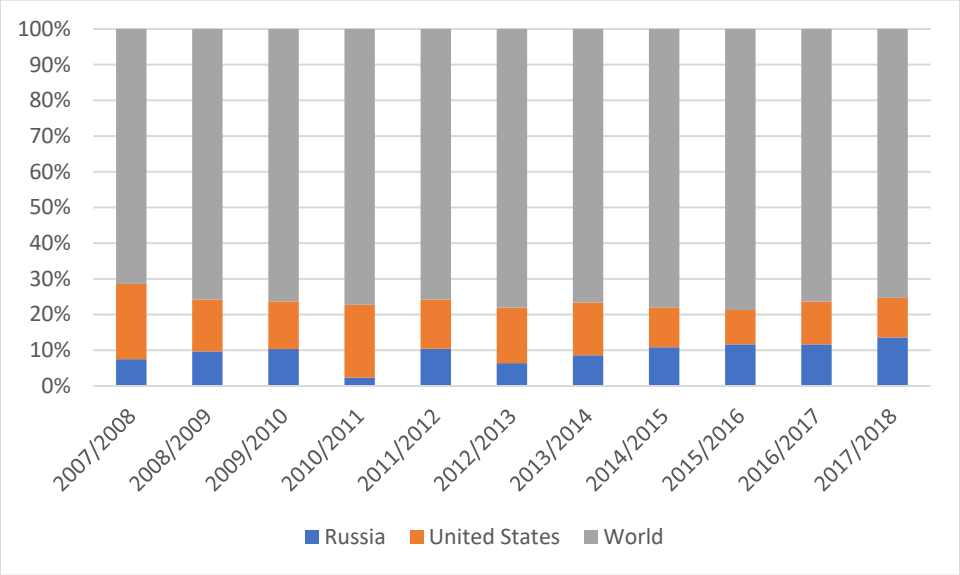
WASDE Projections	**Ukraine Wheat Exports**	**Russia Wheat Exports**	**Total World Wheat Exports (Trade)**
02-10-2014:	11.5 million tonnes	16.5 million tonnes	158.6 million tonnes
05-09-2014:	9.5 million tonnes	18.2 million tonnes	162.0 million tonnes
Change:	Down 2 million	Up 1.7 million	Up 3.4 million tonnes

Source: (WASDE), 13/14 marketing year (https://www.usda.gov/oce/commodity/wasde/)

Note that the total projected world wheat trade rose by over 3 million tonnes from February 2014 to May 2014, contrary to early fears that military conflict in the region would disrupt shipping and restrict wheat exports from Ukraine and/or Russia. In reality, the only effect was a reclassification of wheat export volumes from "Ukraine" to "Russia," as the USDA acknowledged the Russian annexation of Crimea between the February and May WASDE reports. Combined Ukrainian and Russian wheat export volumes only decreased by 300,000 tonnes from the February to May projections, an insignificant 1% decline. Total world wheat trade rose by over 3 million tonnes in the same time frame, reflecting larger production in Canada and Kazakhstan and increased import demand from a variety of countries. EU exporters were the primary beneficiaries of increased world wheat trade. As actual trade disruptions in the Black Sea proved to be minimal--and in fact, global trade volumes grew--the spike higher in wheat futures prices was short-lived with the entire episode spanning less than three months.

Although grain trade disruptions were minimal, one of the far-reaching effects of Russia's Ukraine intervention has been a weaker Russian ruble, which has facilitated Russia expanding its market share in world wheat trade since the events of 2014.

Figure 2. U.S., Russia, and World Wheat Market Share



Source: https://www.dtnpf.com/agriculture/web/ag/markets/futures

Economic sanctions imposed by the U.S., the E.U., and Canada following Russia's annexation of Crimea continue to exert pressure on the ruble. This devaluation was amplified by the collapse in crude oil and energy prices in 2014, a principal Russian export. Economic sanctions, low oil prices, and expanding wheat production in subsequent years--including back to back record harvests in 2016 and 2017--have all contributed to Russia's expanding market share. The relatively strong U.S. dollar combined with Russia's geographic proximity to key import markets in North Africa have resulted in this expanding market share to come primarily at the expense of U.S. exports.

PLAYERS AFFECTED BY THE EVENT

End-User

A commercial user of wheat, such as a flour mill or a baker, is a natural short in the physical market and thus regularly buys wheat futures contracts to protect against rising prices and to lock in profit margins. When futures prices rise like they did in March 2014, the open trade equity of long futures hedges rise at the brokerage account, augmenting available working capital. However, any unhedged risk in the physical market could have easily turned into losses in a price spike. Conversely, a commercial end user with additional coverage beyond fixed contractual needs would have had a competitive advantage over less-hedged peers; gains from the hedges could have been used to make more competitive offers to customers or simply to offset costs thereby increasing profit margin. Faced with a spike in futures prices, a risk manager for a flour mill or commercial bakery is tasked with assessing the potential longevity of higher prices. A brief spike may have little or no substantive impact on profitability whereas sustained higher prices, or a sustained trend

higher in prices, could adversely impact procurement costs and profitability. Although it took about three months (until early June 2014) for SRW futures prices to fully retrace back to February 2014 levels, the bulk of the price increase associated with the conflict occurred from March 3rd to March 20th, 2014.

Effect on End-users

In hindsight, both increasing geopolitical tension between Ukraine and Russia as early as January 2014 as well as the active deleveraging of managed futures funds' short exposure throughout the month of February 2014 were antecedents that could have influenced a risk manager's decision to hedge upside risk appropriately. SRW futures were highly sensitive to the geopolitical conflict but basis risk would be radically different for a U.S. miller of SRW versus an international miller (of an equivalent soft wheat variety) who relied on imports directly from the Black Sea region, including Ukraine and/or Russia. A U.S.-based miller may have reasoned that the conflict in Ukraine would have had little bearing on domestic supply and demand and preferred to weather the storm without a change of plan. However, the situation may have been much more urgent for a miller in Egypt, for example; Egypt imports most of its wheat from Black Sea exporters in Romania, Ukraine, and Russia. For a miller with direct, rather than indirect, price risk associated with a potential supply disruption, risk management would have been more compelling. International traders frequently employ the SRW contract as a stand-in for a generic world wheat hedging instrument.

Options Trader/Market Maker

A market maker is traditionally defined as a trader who provides liquidity and profits from volume crossing back and forth betwixt the bid/ask spread; such a trader does not in theory have a directional bias. In practice, most market makers also carry positions either regularly or occasionally, thus engaging in speculative risk-taking beyond the aim of crossing the bid/ask for a small scalp. For this discussion, the term option trader refers to a hypothetical liquidity provider in SRW options who may engage in both option market making and speculative trading with an emphasis on trading delta-neutral options.

Grain Elevator

Elevators buy grain directly from growers and typically in smaller quantities, for example by the truckload. They then store (literally, elevate) the grain and market it to mills, exporters, or to other grain merchandisers in larger volumes, for example by a 25-car train. Hedging these grain purchases by selling futures contracts is a routine business procedure. Futures hedges can be liquidated later in the market or exchanged with a counterparty when the physical grain is marketed. A grain elevator with physical wheat in inventory and short hedges in place is protected from losses should the futures market fall, thus reducing risk to basis. A merchandiser for an independent grain elevator is tasked with numerous decisions around how and when to best hedge and then to manage those hedges.

Effect on Grain Elevator

The Ukraine conflict and subsequent spike higher in May 2014 SRW futures would have preoccupied an elevator manager on several fronts. First, rising prices increase the capital requirement to maintain existing short hedges. Additional funds must be deposited at the brokerage as marked-to-market losses increase with rising prices. This is the opposite effect of the flour miller/long hedger. Exchange minimum margin requirements also typically increase proportional to observed (historical) volatility. Thus, the availability of working capital is critical for a grain elevator to weather a storm such as March-May 2014. A lack of capital to maintain short hedges could lead to liquidation and realization of losses and further expose the company to downside risk of now unhedged inventory, should prices then fall. This is a worst-case type of scenario for a grain elevator. So upon hearing of Russia's invasion of Ukraine over the weekend of March 1st-2nd, 2014, a risk manager for such an entity with hedged wheat in store would likely be working through various stress-tests to assess individual exposure to market risk and if any additional action is required.

Businesses engaged in trading commodity futures, whether for hedging or speculation, are constantly tasked with assessing the risk of extremely low probability events because such events can be--and are--catastrophic to businesses when they occur. Risk managers might consider the possibility of further military escalation, the involvement of NATO, the possibility of a nuclear strike, etc. Such possibilities, even if remote, should be considered due to the risk of total bankruptcy.

This is more palpable for independent, less capitalized, and small to medium size entities than it is for larger and publicly-owned entities.[4] Given the gravity of the situation and its proximity to key wheat shipping channels, a grain elevator may opt to lift some hedges to reestablish them at a higher price or when more is known about the situation. At first glance, this may appear to be a speculative action when in fact it could be big picture risk management. Some short hedgers purchase calls to protect against extreme upside price risk. This strategy creates a price ceiling after which the long calls offset marked-to-market losses on short hedges. But from the previous discussion of implied volatility in March 2014, the price of such insurance is set at a market rate and gets less attractive as premiums rise.

For a manager concerned about prices rising too high, too fast, a simpler approach is to liquidate the physical ownership of grain and exchange out of the hedges, for example with a flour mill or grain exporter. The timing of such an action, however, is key to profitability for such an operation. Being forced to sell grain at an inopportune time when local cash market conditions are not favorable is contrary to the fundamental business plan of such an operation. However, taking a known incremental loss on one trade may be preferable to taking a remote risk of catastrophic loss. Another consideration for a grain elevator is that typically a rise in futures prices will generate additional farmer selling of grain, which will require additional working capital. Thus, freeing up working capital in the beginning of a bull market may provide greater flexibility to continue normal business operations during a period of rising prices. This may then present an opportunity to expand market share if competitors are more constrained by extreme market conditions and the management of margin capital. In this regard, retaining market share can be a function of liquidity and another compelling reason to manage the upside risk of existing short hedges. A more active approach, such as protecting short hedges with long calls, may create additional flexibility to expand business operations during turbulent market conditions or simply create additional trading opportunities. Such a technique may appear speculative, for example, if it transpired in February

2014 prior to the narrative supremacy of the Ukraine crisis in the financial news. However, by March 2014 an elevator with an upside cap on potential marked-to-market losses of short hedges would find itself well situated to navigate the market volatility of the months to follow.

CTA/Hedge Fund

The majority of assets under management in the commodity space are invested in algorithmic systems. The primary responsibility of the trading supervisors and managers in this arena is to monitor and improve such automated systems. There is a great diversity of strategies employed by money managers, and such systems are frequently updated to reflect evolving market conditions.

A trend-following strategy is a common technique. Although the specific algorithmic process for differentiating a probable trend from random statistical noise, as well as the time horizon for such a trade and its risk management component, will all vary widely among different CTAs and their products. Geopolitical and climactic events can instigate volatility in commodity markets that will generate price signals for such systems. Some event-inspired price signals will liquidate existing positions that may have been open for days or weeks while others may generate new market participation. On an aggregate basis, such activity can be hypothesized with publicly available market data such as exchange open interest and confirmed through weekly CFTC Commitments of Traders data.

Effect on CTA/Hedge Fund

Recall that CFTC data indicate that CTAs and hedge funds held an aggregate net short position in SRW futures leading up to the Euromaiden Revolution and Russia's annexation of Crimea in February/March 2014. This aggregate net short position was in decline throughout the month of February, and by March 11, 2014, managed money was holding an aggregate net long position in SRW wheat. Clearly, price signals were generated such that short positions continued to see reductions while new longs were established, as is confirmed by gross position position-level data. SRW prices trended higher from March 3rd to March 19th yet by mid-June 2014 had scored new life-of-contract lows following larger global production prospects and continued "business as usual" grain shipping out of Ukraine and Russia. Depending on one's time horizon, this event and its effect on wheat prices can be seen as a temporary panic or as a tradable trend.

An automated, trend-following trading system participating in SRW wheat could have been short leading up to the invasion of Crimea, exited the position on a stop-loss order following the price action of March 3rd, 2014, and subsequently entered into a new long position. The hypothetical profit or loss is entirely dependent on timing and risk management practice. The volatility of the market creates opportunity for both profit and loss. Most CTAs and hedge funds are diversified across commodity and financial (currency, interest rate, and equity indexes) futures markets. This diversification allows automated trading systems to cast a wider net in search of actionable price signals. It also mitigates risk by limiting the impact of any one adverse event; a CTA trading 25 different commodities is going to have a proportionally smaller risk per commodity than one trading just 5. For example, a CTA may have been short wheat and taken a loss on March 3rd, 2014, but could have also been long corn, and such a position may have offset losses to the wheat trade. Discretionary fund managers may employ technical (price signal) inputs but will generally also employ a fundamental supply and demand outlook to inform trading

decisions. Because they are not rule-based and often rely on the decision-making authority of one or a small number of traders, discretionary funds generally have more flexibility, at least for trade entry. Discretionary commodity traders, even if not normally active in SRW wheat, may have been attracted to the opportunity in the market by the press coverage of the event and its corresponding price action. An analysis of the supply and demand fundamentals of the market, the potential impact of military conflict in Ukraine, and a reading of the prevailing price trend could be used to plan a speculative trade. Risk management protocols may be employed across the portfolio of trades, for example 1% of total equity. Thus, even a discretionary trade may have a systematic means of risk control which could force liquidation if a certain loss threshold is reached.

CONCLUSION

The case discusses how a geopolitical event impacted the stakeholders of a global agricultural commodity, wheat. The stakeholders--all manner of end users, market makers, grain elevators, hedge funds and others--were all affected by concrete and real price movements or the perceived movements.

This makes for an interesting discussion of the notion of price discovery in a global setting where the traditional supply and demand factors are not the only variables that affect the process of price discovery.

Despite its short-lived nature, the shock of Russia's military intervention in Ukraine triggered enormous price volatility in SRW futures and options that amplified risk and opportunity for hedgers and speculators in the market. The event triggered managed futures funds to completely cover their net short position and flip to a net long position in aggregate.

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Suggested Essays and Discussion Points

A) Is international news of relevance to you? How do you assess the impact of the annexation of Crimea by Russia?

B) What is the conventional (when markets are stable) payoff for the players in this situation? What is the opportunity for the same players to benefit from this kind of geopolitical event?

C) A priori, would you have considered this connection to your daily bread? How?

D) Does this case confirm the trend towards the "financialization" of commodities?

E) How do you see the connection between the event of annexation, the devaluation of the ruble and the Russian balance of trade situation on the wheat trade? Explain.

RISK ASSESSMENT VIA SIMULATION: THE WAUHATCHIE PIKE PROPOSAL

Xiaoman Duan & Robert Stretcher
Sam Houston State University

CASE DESCRIPTION

This case presents an opportunity to carry out a simulated NPV analysis on a proposed expansion project. Readers are challenged to use a multi-sheet Excel workbook to demonstrate the variability associated with the calculated NPV. The case highlights the riskiness of expanding into a new region with which the firm has little prior experience. The case is appropriate for senior or graduate managerial finance courses, especially in programs where extensive use of spreadsheet analysis has been stressed. It should take about an hour and a half of class time and approximately two to three hours of outside work for students, depending on their capability with spreadsheet analyses.

CASE SYNOPSIS

This case presents a strategy for Monte Carlo simulation using the case of a proposed distribution center for Pro Trucking and Delivery Corporation (PTDC), a shipping company currently operating in the southeastern and eastern seaboard states of the United States. Given the riskiness of such long-term project, the adoption of Monte Carlo simulation helps students deepen their understanding on how to incorporate uncertainty into capital budgeting decisions.

INTRODUCTION

The company is considering purchasing industrial land and a warehouse facility near Chattanooga, Tennessee, a key transportation hub providing convenience to both the eastern seaboard via Interstate highways 75, 40, and 81, and the southeastern states via Interstate highways 75, 20, and 59. It also would extend PTDC's shipping range to the Tennessee Valley and Midwestern states, areas where PTDC has difficulty competing because of current cost inefficiencies. The project is also close to access points on the Tennessee River near Chattanooga, and rail hubs in Chattanooga.

This facility would not only expand PTDC's service area; it would also make accessing areas further inland more efficient, since PTDC's current distribution infrastructure is along Interstate highway 95 on the east coast, and Interstate highway 10 along the coast of the southeastern states. It would allow PTDC to service these areas using a decentralized network node approach rather than their current hub approach, centered in Jacksonville, Florida at the intersection of Interstate highways 95 and 10. The cost efficiencies of the network node approach and the additional benefit of the extended service area has the potential of substantial benefit for

the firm, but the possible range of cashflow deviation is of concern. The company has no prior experience with this type of expansion and thus, no prior data on which to assess the range of possible outcomes. The firm's analysts, accountants, operations managers and marketing managers have collected data for the estimates of sales growth, expense ratios, and tax effects of the project, summarized in Exhibit 1.

The case provides an opportunity to augment coverage of capital budgeting scenario analysis, and to give students an exercise that requires multi-page referencing in Excel. It also can provide output data that can be summarized into a histogram and frequency distribution chart. This process allows for a visual of the risk that a project could return a negative NPV result. The distribution of NPVs thus provides better information on which to base a capital asset investment decision than would a discrete NPV value based on averages of sales growth, expense ratios, and tax rate.

Pro Trucking and Delivery Corporation (PTDC)

Bob Merkel sat in his office chair, watching the mist float by the meadow outside. What a pleasant benefit he enjoyed from the COVID-19 fallout; he had swapped a downtown Atlanta, Georgia office (always loud, busy, and difficult to get to maneuvering through Atlanta traffic) for a peaceful home office in the Lookout Valley on the Tennessee-Georgia border. He was awaiting a data summary from Pro Trucking and Delivery Corporation (PTDC), a company that had contacted him to carry out a simulation analysis of a capital investment proposal. Bob had specialized knowledge of the north Georgia transportation industry. He was also conveniently located in one of the most critical transportation conduits in the eastern United States. Here, shipping infrastructure of all kinds existed: CSX and Norfolk Southern rail yards, river transportation hubs on the Tennessee River, and critical intersections of the Interstate Highway System.

Bob's email alerts began chirping rapid-fire. He was expecting data from PTDC that would form the basis for a simulation. He was receiving marketing, accounting, and operations summaries for PTDC's proposed project, a large hub facility that would be located just up the road from him off Wauhatchie Pike. The proposed project was called the Wauhatchie Pike Proposal. The potential increases in revenues and potential cost efficiencies were complex to estimate and the range of outcomes had the potential of being quite large. Bob's task was to summarize the data into estimates of variation in revenues and costs and take into account expected changes in corporate taxation policies in the current political environment. His summary would then be used to run a Monte Carlo simulation for the proposal, and provide a project summary to the firm, complete with recommended actions.

Bob poured a large cup of coffee for himself, and sat in his desk chair, taking one more glimpse at the fog rolling across the meadow before turning his attention to the files coming in via email. Summarizing the data into estimates for average sales growth, cost ratios, and tax rates would be challenging. But the major concern was the variation in those estimates, which he would capture by standard deviation projections. These would vary by each forecasted year, since subsequent years were dependent on the company's early management of the project. He certainly understood why the firm wanted outside expertise involved: the project was risky, to say the least.

Bob's Summary

After a few days of sifting through the piles of data, Bob completed the data summary necessary for a Monte Carlo simulation. His summary is in Exhibit 1. He then structured the inputs into a typical inputs page template using Excel (Exhibit 2) so that he could spend the next day carrying out the simulation and writing up an executive brief for PTCD.

Exhibit 1. Bob's Summary

2022 Sales estimate from the project (as if the project were already up and running): $14,656,000

Expected sales growth per year:

2023: 8%, 2.8% std deviation
2024: 6.2%, 5.2% std deviation
2025: 6%, 3.5% std deviation
2026: 5.5%, 2.7% std deviation
2027: 5%, 3.1% std deviation
2028: 4.5%, 3.5% std deviation
2029: 4%, 3.5% std deviation
2030: 3%, 3.2% std deviation
2031: 2%, 3% std deviation
2032: 2%, 2.5% std deviation
2033: 2%, 1.5% std deviation
2034: 2%, 1.5% std deviation
2035: 2%, 1.5% std deviation
2036: 2%, 1.5% std deviation
2037: 2%, 1.5% std deviation
2038: 2%, 1.5% std deviation
2039: 2%, 1.5% std deviation
2040: 2%, 1.5% std deviation
2041: 2%, 1.5% std deviation
2042: 2%, 1.5% std deviation

Cash expense ratios:

2023: 35% of sales, 3.3% std deviation
2024: 36% of sales, 2.5% std deviation
2025: 35% of sales, 2.5% std deviation
2026: 35% of sales, 2.5% std deviation
2027: 35% of sales, 2.5% std deviation
2028: 34% of sales, 2.4% std deviation
2029: 34% of sales, 2.4% std deviation
2030: 34% of sales, 2.3% std deviation
2031: 34% of sales, 2.3% std deviation
2032: 34% of sales, 2.3% std deviation

2033: 34% of sales, 2.3% std deviation
2034: 34% of sales, 2.3% std deviation
2035: 34% of sales, 2.3% std deviation
2036: 34% of sales, 2.3% std deviation
2037: 34% of sales, 2.3% std deviation
2038: 34% of sales, 2.2% std deviation
2039: 34% of sales, 2.2% std deviation
2040: 34% of sales, 2.1% std deviation
2041: 34% of sales, 2.1% std deviation
2042: 34% of sales, 2.1% std deviation

$47,430,000 Asset Expansion, depreciated on a 15-year MACRS schedule, with a 20-year life

MACRS 15-year Depreciation Percentages per year: (use the depreciable base of $47,430,000)

year 1 5%	year 6 6.23%	year 115.91%
year 2 9.5%	year 7 5.9%	year 125.9%
year 3 8.55%	year 8 5.9%	year 135.91%
year 4 7.7%	year 9 5.91%	year 145.9%
year 5 6.93	year 105.9%	year 155.91%
		year 162.95%

Tax rates expected: 34.8% of EBIT on average, 1.2% standard deviation, based on higher income levels after the expansion and expected political action concerning tax policy)

Appropriate discount rate for the project: 18.9%

Recommended Monte Carlo iterations: 5,000

Exhibit 2. Bob's Inputs Page

	A	B	C	D	E	F	G	H	I	J	K
1			2023	2024	2025	2026	2027	2028	2029	2030	2031
2											
3	Revenues	Mean	0.08	0.062	0.06	0.055	0.05	0.045	0.04	0.03	0.02
4		Std Dev	0.028	0.052	0.035	0.027	0.031	0.035	0.035	0.032	0.03
6	Cash Expenses	Mean	0.35	0.35	0.35	0.35	0.35	0.34	0.34	0.34	0.34
7		Std Dev	0.033	0.025	0.025	0.025	0.025	0.024	0.024	0.023	0.023
9	MACRS	Percent	0.05	0.095	0.0855	0.077	0.0693	0.0623	0.059	0.059	0.0591
10	Base:	Amount	$2,371,500	$4,505,850	$4,055,265	$3,652,110	$3,286,899	$2,954,889	$2,798,370	$2,798,370	$2,803,113
11	$47,430,000										
13	Tax as % of EBIT	Mean	0.348	0.348	0.348	0.348	0.348	0.348	0.348	0.348	0.348
14		Std Dev	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
16	2022 Sales Base:										
17	$14,656,000										
18	Risk Adjusted										
19	Discount Rate	0.189									

L	M	N	O	P	Q	R	S	T	U	V
2032	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**
0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
0.025	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015
0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
0.023	0.023	0.023	0.023	0.023	0.023	0.022	0.022	0.021	0.021	0.021
0.059	0.0591	0.059	0.0591	0.059	0.0591	0.0295	0	0	0	0
$2,798,370	$2,803,113	$2,798,370	$2,803,113	$2,798,370	$2,803,113	$1,399,185	$0	$0	$0	$0
0.348	0.348	0.348	0.348	0.348	0.348	0.348	0.348	0.348	0.348	0.348
0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012

Questions and Exercises

1. Create a worksheet in Excel specifically for *Revenues* projection. All the revenues are assumed to follow a random growth rate model. Specifically, the revenues next year will be determined by the revenues this year times (1+the growth rate of revenue for this year). Calculate the revenue forecast from 2023 to 2042. Each iteration represents a possible revenue forecast given the parameters defined. Run 5,000 iterations to minimize forecasting bias.

2. Forecast cash expenses. Again, a good starting point is to create a separate worksheet named "Cash Expenses." Cash expenses are calculated as percentages of estimated revenues. The proportion of estimated revenues that are cash expenses for a given year is a random variable that follows a normal distribution with mean and standard deviation specified on the Input page. Estimate the cash expenses estimates for the next 20 years. Again, run 5,000 iterations.

3. Estimate the Incremental Net Operating Cash Flow (INOCF) for the project. Calculating the INOCF is an important step towards the project selection because it conveys what additional cash flow that can be generated if the new project is accepted. To calculate $INOCF_t$, bear in mind that the expected tax rate is subject to uncertainty and is a normally distributed input. Calculate the $INOCF_t$ for each year from 2023 to 2042 and for each iteration and again, run 5,000 iterations.

4. Create a separate worksheet labeled "PVINOCF" to calculate the Present Value of $INOCF_t$ using the appropriate discount rate of 18.9%.

5. On the same PVINOCF worksheet, sum up the previously calculated $PVINOCF_t$ over the twenty years. Then subtract the initial cash outlay from the sum of $PVINOCF_t$ to obtain the net present value (NPV) of the proposed project, again, 5,000 iterations. This results in a column of 5,000 possible NPV values.

6. In general, a company can apply the decision rule based on NPV to accept or reject the project. Can you specify the NPV decision rule?

7. To help visualize how often the simulations of the project will generate positive NPVs, create a histogram in Excel. You can use the histogram function in the data analysis toolpack. After plotting the histogram, analyze how frequent NPVs fall into the positive range and the negative range. Do positive NPVs have a higher likelihood than the negative NPVs?

8. What is your recommendation to PTDC? Provide supporting documentation, explanations, and exhibits to justify your recommendation.

THE CASE OF THE CRIPPLED CONVICT

Michael Fedoryshyn, St. John Fisher College
Ausher Kofsky, Western New England University
Merouane Lakehal-Ayat, CESAG Business School

INTRODUCTION

Lawyers in medical malpractice lawsuits attempt to increase or decrease the size of the award depending on whether they represent the plaintiff or the defense. This case, based on a lawsuit in which an author testified as an expert witness for the defense, is intended to increase student awareness of the financial, tax and legal issues involved with malpractice lawsuits. The case also highlights how relatively small changes in assumptions can have significant impacts on the amounts awarded.

The plaintiff, an inmate by the name of Luke Kelly, suffered a basketball injury in the correctional facility in which he was incarcerated. Due to the lack of prompt and competent medical care, he suffered permanent injuries and subsequently sued and won the case. Students are required to analyze the facts presented and propose an amount to award the plaintiff.

Not all states use the same statutes to determine the amounts awarded. For purposes of uniformity, the statutes used in this case are based on New York State Statutes, the state in which the lawsuit occurred. However, as an optional exercise students can be asked to research the applicable statutes in the state in which they reside and apply them to the facts in the case.

The case can be assigned as an individual case or students can be assigned to groups and asked to represent either the plaintiff or the defense. Students are expected to minimize or maximize the amount of the award depending on whom they represent and find creative and legal ways to justify awarding smaller or larger amounts.

BACKGROUND

Luke Kelly[1] was an inmate at the Rosemary Correctional Center in Upstate New York, convicted on a charge of robbery. On December 2, 2014, while playing basketball in the prison gym, Luke collided with another player, fell to the gym floor, heard his right knee "pop," and immediately felt severe pain. Two inmates carried him to the infirmary where the prison nurse examined him. The nurse gave him aspirin, two crutches, a bag of ice, and a small elastic bandage.

Two days later, on December 4, Luke returned to the infirmary because his right knee was still severely swollen. Dr. Muncham, the director of the medical department at the prison, saw him and noted no tendon damage, but ordered x-rays, which were taken on December 7, five days after the injury. The x-rays were evaluated by the chief of radiology at a local hospital who

[1] The names and dates have been changed to protect the parties involved.

forwarded his report to Dr. Muncham with the following conclusion: "If the patient's symptoms persist, further orthopedic evaluation would be helpful."

On December 8, Luke's request for an examination by an outside doctor was denied.

At 2:30 a.m. on December 10, 2014, the corrections officer on duty advised the nurse that Luke was complaining about his knee being extremely swollen and painful. The nurse denied him emergency treatment and directed that he be added to the routine morning sick call list. At 7:30 a.m., Luke was seen by a nurse who prescribed aspirin and bed rest and recommended that Luke be seen by Dr. Muncham when he returned to the prison on December 11.

On December 11, Dr. Muncham examined Luke and ordered a consultation with an orthopedic specialist on a non-emergency basis, despite the fact that Luke could barely move about, even with crutches.

The orthopedic examination occurred on January 12, 2015, at the local hospital, more than 30 days after the referral. The diagnosis was tendon rupture and surgery was scheduled for January 18. No medical care, other than the issuance of pain relievers, was given to Luke between December 11, 2014 and January 12, 2015.

Surgery began on January 18 but was terminated because of problems administering anesthesia. Luke weighed 350 pounds and a concern arose as to whether his heart would suffer an adverse reaction to the sedation. The tendon repair surgery finally took place on February 8, 2015.

Luke was released from prison on June 1, 2015. He filed suit in July 2015 alleging that while he was an inmate at Rosemary: (1) he was denied prompt and competent medical care; and (2) as a result of medical malpractice, he sustained permanent injury. He asked for compensatory and punitive damages.

THE TRIAL

To be successful in a medical malpractice case, the plaintiff (Luke) needs to show that the defendant (the State) deviated from acceptable standards of medical care. Medical malpractice lawsuits generally involve differing opinions offered by expert medical witnesses who endeavor to prove or refute the claim that there has been a deviation from accepted medical practices.

The State claimed that the medical care Luke received met the standard required of a general practitioner working in an outpatient clinic. The State further asserted that Luke had aggravated his condition by his own negligent acts after the original injury. The expert witness for the defendant noted that tendon ruptures are very difficult to diagnose and that only a qualified orthopedist could or should make the diagnosis. He conceded, however, that prompt surgical intervention improves the prognosis for someone with a ruptured tendon and that a delay of six weeks affects the ability to repair a ruptured tendon to a significant extent.

The expert witness for Luke testified that a reasonable physician should have been able to examine the x-rays of December 7 and diagnose a torn tendon in the knee. The witness was also critical of the fact that Dr. Muncham failed to perform a straight leg-raising test on Luke. A basic test in cases of knee injury, it is very simple to perform and provides good evidence of torn or ruptured tendons. The failure to quickly immobilize the right leg was also deemed improper. The witness testified that Dr. Muncham had deviated from accepted medical standards of care by: (1) failing to recognize the ruptured tendon, (2) failing to make a prompt referral to an orthopedic examination, and (3) failing to promptly treat the injury surgically.

The Judge's Findings

The initial trial regarding whether the State was liable for medical malpractice was held before a judge. The judge issued the following decision on November 1, 2016:

"I find that the Defendant [the State] is totally responsible for the medical malpractice. Therefore, the Defendant must answer in damages. There is no credible evidence to support the notion that Luke was in any way self-destructive or that he was contributorily negligent in the slightest degree."

The damage portion of the trial then shifted to a jury to determine the amount of damages to be awarded in the case.

Other Legal Considerations

While different jurisdictions may have different standards, typical damages for medical malpractice actions are threefold: 1) lost or impaired earnings, 2) medical expenses, and 3) pain and suffering and similar non-economic harms such as the inability to perform certain functions, mental distress, and damage to personal reputation. Unlike the first two categories, awards for pain and suffering and other non-economic harms are subjective both in the nature and determination of the value of damages. A fourth category of damages, punitive damages, is generally not awarded in any action based on medical malpractice.

Evidence is admissible with respect to all factors legally relevant to the jury's determination of damages. Such factors can include inflation assumptions, projected wage increases, future medical costs, and time-value-of-money considerations.

Courts can award only those damages authorized by law. Those damages must be computed in accordance with the legal statutes governing such computations, which sometimes vary widely from "common sense" or time-value-of-money principles. Therefore, carefully adhere to the state statutes provided in Exhibit 1 when developing answers that require you to refer to the state statutes.

The state statutes in Exhibit 1 are based on New York State statutes, the state in which the injury occurred and the lawsuit was decided. The statutes in Exhibit 1 can be used to determine the amount that should be awarded the plaintiff.

Once a judge or jury determines the amount to be awarded, other state statutes typically determine how the amount of the award will be disbursed. Some jurisdictions dictate that judgments below a certain amount are to be disbursed in a lump-sum payment. Larger awards may be subject to annuity payments and the calculation of the annuity payments is subject to time value of money considerations. For purposes of this case the assumption is that any award is to be made in a lump sum distribution on January 1, 2017.

(Students should check with their instructor to see if any other state statutes are to be used in analyzing this case.)

Additional Background Information

Assume at the time of the injury on December 2, 2014, Luke was 37 years old and had a life expectancy of 78 years.

Luke still suffers pain when he puts weight on his right knee, lies in a prone position, squats, kneels, crawls, or negotiates stairs. His knee is partially blocked from straightening, which creates a major disability as his leg could give out without warning.

Luke can no longer play basketball or football, run, jump or walk quickly. In addition to these limitations in leisure, recreational and other practical situations, the injuries sustained permanently impede his ability to perform the work in which he was engaged prior to his incarceration and to which he returned after release.

Before incarceration, Luke had been employed by a large sewer company for 14 years, carrying and operating large equipment, digging, installing and cleaning sewers, installing and repairing plumbing, etc. He can no longer carry or operate such equipment, climb ladders or perform similar tasks required by his previous employment. Accordingly, Luke's hourly rate of pay was reduced upon his return to work from $14 to $10 per hour, reflecting his assignment to less vigorous tasks. Luke typically worked 50 hours per week, 10 hours of which earned overtime at 150% of the regular hourly rate.

Luke planned to work until age 62, although he is not eligible for full social security retirement benefits until the age of 67. The following table estimates his monthly social security retirement benefits at ages 62 and 67 based on making $10 per hour versus $14 per hour. The monthly benefits are presented based on current dollar amounts and also indexed for future dollars based on a 2.7% annual increase in the Cost-of-Living Adjustments (COLA) and an approximate 3.8% increase in the National Average Wage Index (AWI).

Age	**S.S. Benefits based on $10 per hour wage rate**		**S.S. Benefits based on $14 per hour wage rate**	
	Current Dollars	**Future Dollars**	**Current Dollars**	**Future Dollars**
62	$ 826	$ 1,800	$ 1,021	$ 2,216
67	$1,204	$ 3,007	$ 1,494	$3,716

Note: These estimates are from the Social Security Administration retirement calculators which can be found at their website at www.ssa.gov. If you want to know your full retirement age or estimate your S.S. monthly benefits, the site provides this information along with a convenient and easy to use retirement calculator.

Luke's employer pays for 75% of the cost of medical insurance and the employee pays 25%. Luke elected medical coverage that pays for normal doctor visits and any required surgery. He has a $20 co-pay for each doctor visit and pays 100% of the cost of any prescription medicine. Luke has one living relative, his sister, Trisha.

Subsequent Developments

On June 1, 2016, before this trial was completed, Luke was arrested and incarcerated for another robbery. He remained in a local jail from then through his trial. He was convicted on October 1, 2016, sentenced to 7 years without parole, and immediately returned to the Rosemary Correctional Center.

Tax Assumptions and Considerations

The primary federal income tax rules related to medical malpractice awards are found in Internal Revenue Code §104(a)(2). In general, awards that courts make for 1) medical costs, 2) pain and suffering directly related to the physical injury, and 3) earnings lost directly as a result of the physical injury are non-taxable. Awards for 1) emotional distress not directly related to the physical injury (e.g., embarrassment about an impaired ability to walk), 2) punitive damages, and 3) interest are taxable.

Assume that state income tax law follows federal income tax law with respect to the treatment of such damages. Also, for simplicity, assume that federal taxable income equals his state taxable income. Disregard any deductions.

To compute federal income tax liability on any awards, use the following table:

Federal Taxable Income	Federal Income Tax
$ 0 - 9,225	10%
$ 9,226 - 37,450	$ 923 + 15% over 9,225
$ 37,451 - 90,750	$ 5,156 + 25% over 37,450
$ 90,751 - 189,300	$ 18,481 + 28% over 90,750
$ 189,301 - 411,500	$ 46,075 + 33% over 189,300
$ 411,501 - 413,200	$ 119,401 + 35% over 411,500
> $ 413,201	$ 119,996 + 39.6% over 413,200

To compute state income tax liability on any awards, use the following table:

State Taxable Income	State Income Tax
$ 0 - 8,300	4%
$ 8,300 - 11,450	$ 332 + 4.5% over 8,300
$ 11,450 - 13,550	$ 474 + 5.25% over 11,450
$ 13,550 - 20,850	$ 584 + 5.9% over 13,550
$ 20,850 - 78,400	$ 1,015 + 6.45% over 20,850
$ 78,400 - 209,250	$ 4,727 + 6.65% over 78,400
$ 209,250 - 1,046,350	$ 13,428 + 6.85% over 209,250
> $ 1,046,350	$ 70,700 + 8.82% over 1,046,350

Additional Data and Assumptions

Any lump-sum amount paid to satisfy the damage award, along with whatever interest amount (at 4% annual interest) is deemed to have accrued on the award, will be paid on January 1, 2017.

Legal fees are 25% of whatever the plaintiff receives, payable whenever the plaintiff gets paid. Such fees are paid directly to the lawyer. Accordingly, for tax and all other purposes, only 75% of any award is received by the plaintiff.

Required:

Assume the prison is located in the State of New York. New York State's pertinent statutes governing medical malpractice actions are included in Exhibit 1**.** The judge's finding is,

as noted above, against the defendant; and it is time for the jury to determine the damages to be awarded the plaintiff.

1. Assume you represent the plaintiff,

a. Using the statutes in Exhibit 1, what is the amount of the total lump sum damages you would propose to the jury? Prepare a schedule that shows mathematically how you derived your proposed damage award. Be sure to document and explain any assumptions made in your analysis. You may wish to consider factors such as future wage increases and inflation.

b. Assuming the total damages would be disbursed in a lump sum payment on January 1, 2017, how much would the State of New York have to pay to both the plaintiff and his attorney?

c. How much taxable income would Luke have to include in his 2017 tax return with respect to the award?

d. What would the Federal and State taxes be on the amount in c?

2. Assume you represent the defendant,

a. What is the amount of the total lump sum damages you would propose to the jury? Note that unreasonably low proposals are self-defeating and may lead to sanctions by the court.

Prepare a schedule that mathematically demonstrates how you derived your proposed damage award. Be sure to document and explain any assumptions made in your analysis. You may wish to consider factors such as future wage increases and inflation.

b. Assuming the total damages would be disbursed in a lump sum payment on January 1, 2017, how much would the State of New York have to pay to both the plaintiff and his attorney?

c. How much taxable income would Lewis have to include in his 2017 tax return with respect to the award?

d. What would the Federal and State taxes be on the amount in c?

Exhibit 1. Determination of the Amounts to be Awarded, Statutes from the State of New York

§ 4111 General and Specific Verdicts

- In a medical malpractice action, the court shall instruct the jury to classify its award into the following three categories: lost or impaired earnings, medical expenses, and non-pecuniary losses. Non-pecuniary losses are all losses other than medical expenses and lost or impaired earnings, and include pain and suffering and all similar harms. The court shall further instruct the jury to separate each of the three categories of damages into compensation for past and for future damages.

- The court shall further instruct the jury to award the full amount of future damages, as calculated, without reduction to present value.

Case Law - Punitive Damages in Medical Malpractice Actions

- Punitive damages are recoverable in a medical malpractice action only where the defendant's conduct evinces a high degree of moral culpability or willful or wanton negligence or recklessness.

§ 4545 Admissibility of Collateral Sources of Payment

- In a medical malpractice action, evidence shall be admissible to establish that any past or future damage was or will, with reasonable certainty, be offset in whole or part from any collateral source (such as insurance, Social Security, Workers Compensation or employer provided benefit programs), except for life insurance and those payments where there is a statutory right of reimbursement. If the court finds that any collateral source has or will so offset, it shall reduce the related damage award accordingly.

§ 4546 Consideration of Personal Income Taxes

- In a medical malpractice action in which the plaintiff claims lost or impaired earnings as damages, evidence shall be admissible to establish the personal income taxes the law would have obligated the plaintiff pay had he actually earned such lost or impaired earnings.

- The court shall, if warranted by the evidence, reduce any award for lost or impaired earnings by the amount of such personal income taxes the court finds, with reasonable certainty, that the plaintiff would have been obligated by law to pay had he actually earned such lost or impaired earnings.

§ 5002 Interest from Verdict

- Interest shall be paid by the defendant in any medical malpractice action from the date the verdict was rendered to the date of the entry of final judgment.

REFERENCES

Commissioner v. Schleier, 515 U.S. 323 (1995). U.S. Supreme Court case confirming that damages for lost earnings directly attributable to the personal injury are non-taxable, even though the earnings would have been taxable had they actually been earned.

Dmytryszyn v Herschman, 78 A.D.3d 1108, 912 N.Y.S.2d 107 (N.Y.A.D. 2 Dept., Nov 30, 2010); *Hill v 2016 Realty Assoc.*, 42 A.D.3d 432, 839 N.Y.S.2d 801, (N.Y.A.D. 2 Dept., Jul 10, 2007).

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WHITLEY MANUFACTURING COMPANY: A COMMERCIAL CREDIT CASE STUDY USING UCA CASH FLOW ANALYSIS

Ernest S. Fletcher, Jr. and John T. Rose
Baylor University

This comprehensive, two-part case requires the analysis of a firm's cash flows in preparation for the firm's annual request for a one-year renewal of a Revolving Line of Credit (RLOC) from a commercial bank. Part 1 focuses on the Uniform Credit Analysis (UCA) Cash Flow Statement to address the four critical areas of commercial credit analysis, highlighting how the firm has been using the credit provided by the RLOC. Part 2 then extends the UCA cash flow analysis to discern more fully how the firm has been using the borrowing capacity provided by the RLOC. The case is appropriate for a course in commercial bank management, financial statement analysis, intermediate corporate finance, or advanced financial accounting.

CASE SCENARIO

It is early Spring 2021, and Anthony Gonzalez has been working as an analyst at the consulting firm, Financial Analytics, Inc. (FAI), since graduating from college in 2018 with a BBA degree in economics and finance. One of FAI's clients, Whitley Manufacturing Company (Whitley), has engaged FAI with a consulting request related to an upcoming loan renewal, and Anthony has been assigned to work on the project. Normally, Whitley would have completed this work inhouse, but because of other on-going projects the firm's Chief Financial Officer, Janice Wilson, has decided to go outside the firm in this instance. FAI has provided consulting services to Whitley on several previous projects in recent years and has always done a good job.

In preparing to meet with Ms. Wilson to discuss the project, Anthony has learned that Whitley is a closely-held, regional corporation based in Colorado. It was incorporated in 1972 and produces metal hardware for cabinets, doors, furniture, caskets, and luggage, among other items. From conversations with colleagues who have worked on other projects for Whitley, Anthony believes the firm is well managed and a strong competitor in the hardware manufacturing industry.

This morning Anthony visited with Ms. Wilson to learn about the assignment. As she explained, Whitley has a $50.0 million ($50,000 in $ thousands), one-year Revolving Line of Credit (RLOC) with Sinclair National Bank (Sinclair) that is intended to support Whitley's working capital needs and will mature in 60 days. The credit line is secured by eligible accounts receivable and inventory, and the source of repayment is the conversion of current assets. In addition, Sinclair originated several long-term loans to finance Whitley's fixed assets.

As in past years, Ms. Wilson hopes to continue the RLOC with a one-year renewal, but to do so she must meet with Jim Houston, Whitley's banker at Sinclair, to discuss the firm's current and future financial prospects. In that regard, she knows that Houston will be particularly

interested in Whitley's cash flow picture over the past several years. Because Anthony took a college course in commercial bank management and has proven to be an excellent analyst, he has been assigned to work with Ms. Wilson to help her prepare for her meeting with Mr. Houston.

CASE REQUIREMENTS

Acting in the role of Anthony Gonzalez, your objective is to determine whether there is a good argument for Sinclair's renewing Whitley's RLOC, after which you must brief Ms. Wilson prior to her meeting with Mr. Houston. During your initial discussion with her, she noted that Sinclair uses the Uniform Credit Analysis (UCA) Cash Flow Statement rather than its accounting counterpart, FASB 95 Statement of Cash Flows, to analyze a firm's cash flow. As argued recently in Beach et al. (2017), the UCA format is a superior alternative to the FASB 95 format for commercial credit analysis. For some history of the UCA Cash Flow Statement and a comparison with FASB 95, see Appendix 1.

Having met with Ms. Wilson, you are armed with Whitley's financial statements for the years 2017-20; see Exhibit 1, year-end balance sheets, and Exhibit 2, annual income statements. Your initial task is to use the data in Exhibits 1 and 2 to complete Exhibit 3, a template for the UCA Cash Flow Statements for the three years 2018-20. To facilitate your calculations your instructor will provide you with a student Excel workbook containing Exhibits 1, 2, and 3.

With your completed UCA Cash Flow Statements for 2018-20 you are ready to analyze Whitley's cash flow picture to determine if there is a good case for Sinclair's renewing Whitley's RLOC. To do so you will first address (Part 1) the four critical areas of commercial credit analysis, as outlined in Beach et al. (2017) and discussed in Appendix 2, highlighting how the firm has been using the credit provided by the RLOC. Next (Part 2), you will extend the UCA cash flow analysis to discern more fully how the firm has been using the borrowing capacity provided by the RLOC. Analyzing the UCA cash flow data should reveal whether the firm is using its RLOC borrowing capacity for purposes other than financing short-term assets.

With your completed analysis you will then prepare an overall evaluation for Ms. Wilson, explaining how the results of your analysis from Parts 1 and 2 justify (or not) renewing Whitley's RLOC. In addition, you may offer any further advice regarding the firm's borrowing needs.

Finally, you will submit electronically your UCA cash flow analysis together with the completed Exhibit 3 in your student Excel workbook to the instructor so he/she can check the Exhibit 3 data calculated from Exhibits 1 and 2 and the summary cash accounts, along with your analysis.

Part 1: Whitley and the Four Critical Areas of Commercial Credit Analysis

Focusing on Whitley's UCA Cash Flow Statements in Exhibit 3 for 2018-20, you should address the four critical areas of commercial credit analysis, as outlined in Beach et al. (2017) and listed below, to prepare Ms. Wilson for her meeting with Mr. Houston. To facilitate and guide your analysis, several sub-questions are listed under each of the critical areas.

1. *What is the Cash Source(s) for Servicing Existing Interest-Bearing Debt?*

a. From a commercial lending standpoint, what is the preferred source of interest-bearing debt service?

b. How did Whitley fare during the 2018-20 period regarding the preferred source of interest-bearing debt service, as evidenced by what summary cash accounts?
c. Is there any year(s) in which Whitley's preferred source of interest-bearing debt service was problematic? Explain.

2. *Is There a Requirement for Additional Financing?*

a. Under what conditions does a firm generate a requirement for additional financing? How might the firm cover such a requirement?
b. In what year(s) did Whitley record a Financing Surplus/Requirement? How did the firm cover any Financing Requirement?
c.

3. *What is the Cause(s) of the External Financing Requirement?*

a. Under what condition(s) will the UCA Cash Flow Statement point to an operating borrowing cause?
b. Under what condition(s) will the UCA Cash Flow Statement point to a long-term borrowing cause?
c. Was there an operating borrowing cause for Whitley in any year? Explain.
d. Was there a long-term borrowing cause for Whitley in any year? Explain.

4. *What is the Cash Source(s) to Meet any Financing Requirement?*

a. What is the link between the Financing Surplus/Requirement and the Total External Financing in any year?
b. What is the link between the Financing Surplus/Requirement recorded by Whitley in all three years and the Total External Financing each year?

Part 1 Summary Assessment

Based on your discussion of the four critical areas of commercial credit analysis, what is your preliminary assessment of Whitley's request for a renewal of its RLOC from Sinclair?

Part 2: Whitley's Use of Its RLOC Borrowing Capacity During 2018-20

Again, focusing on Whitley's UCA Cash Flow Statements in Exhibit 3 of the student Excel workbook, you will extend the cash flow analysis to discern more fully how the firm has been using the borrowing capacity provided by the RLOC. Analyzing the data in the UCA Cash Flow Statements should confirm if the firm is/is not using its RLOC borrowing capacity for purposes other than financing short-term assets.

It is important to note that a basic commercial loan underwriting principle is to match the term of a loan with the life (lives) and cash flow(s) of the pledged asset(s). This lending technique (sometimes known as short-to-short and long-to-long) is imperative for the continued health of a growing company. A short-term RLOC is typically used to support a firm's working capital needs, while long-term debt is commonly employed to finance long-term assets such a property, plant, and equipment. A company can potentially experience liquidity problems and increase its probability of financial distress if it uses the borrowing capacity under a short-term RLOC to make a payment on a long-term debt obligation and/or to purchase a long-term asset(s).

Recognizing this loan underwriting principle, your objective is to discern the actual purpose(s) of Whitley's short-term advances against its RLOC. That, in turn, will allow you to

determine whether there is a financing mismatch between Whitley's short-term advances on its RLOC and how the firm has been using the funds provided by the RLOC; see, for example, Fletcher, Jr. and Rose (2019). To facilitate and guide your analysis, you should answer the following series of questions based on the UCA data following the summary account, Cash After Financing Costs, for each of the study years:

1. Based on the UCA data following Cash After Financing Costs for 2018 in Exhibit 3, what can you say, if anything, about the purpose(s) of Whitley's short-term borrowing that year?
2. Based on the UCA data following Cash After Financing Costs for 2019 in Exhibit 3, what can you say, if anything, about the purpose(s) of Whitley's short-term borrowing that year?
3. Based on the UCA data following Cash After Financing Costs for 2020 in Exhibit 3, what can you say, if anything, about the purpose(s) of Whitley's short-term borrowing that year?

Overall Evaluation

Based on your answers to the questions in Parts 1 and 2, what is your assessment of the appropriateness of Sinclair National Bank's renewing Whitley's RLOC for another year? Might you recommend that Whitley seek other, long-term borrowing from Sinclair?

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Exhibit 1

WHITLEY MANUFACTURING COMPANY
Year-End Balance Sheets

($ in thousands)

	2017	2018	2019	2020
Assets				
Cash & Marketable Securities	13,727	12,236	13,355	10,443
Accounts Receivable	45,465	52,218	55,208	62,785
Reserve for Bad Debts	(1,591)	(1,634)	(1,932)	(2,198)
Inventory	77,569	102,159	128,796	135,117
Prepaid Expenses	1,299	1,191	2,165	1,624
Total Current Assets	136,469	166,170	197,592	207,771
Gross Fixed Assets	703,625	711,781	726,176	772,966
Less: Accumulated Depreciation	(394,030)	(426,505)	(469,805)	(517,164)
Net Plant and Equipment	309,595	285,276	256,371	255,802
Other Assets	17	20	59	16
Total Assets	446,081	451,466	454,022	463,589
Liabilities				
Accounts Payable	41,960	57,003	46,815	53,194
Accrued Wages/Salaries	3,092	2,706	3,383	4,027
Notes Payable - Bank	2,500	6,500	24,000	49,000
Current Maturities of Long-Term Debt	22,361	23,623	24,707	25,035
Income Taxes Payable	4,144	4,575	2,399	1,394
Total Current Liabilities	74,057	94,407	101,304	132,650
Long-Term Debt	185,649	163,288	154,821	130,866
Total Liabilities	259,706	257,695	256,125	263,516
Stockholders' Equity				
Common Stock	4,000	4,000	4,000	4,000
Paid-In Capital	20,000	20,000	20,000	20,000
Retained Earnings	162,375	169,771	173,897	176,073
Total Stockholders' Equity	186,375	193,771	197,897	200,073
Total Liabilities and Stockholders' Equity	446,081	451,466	454,022	463,589

Exhibit 2

WHITLEY MANUFACTURING COMPANY
Income Statements

($ in thousands)

	2017	2018	2019	2020
Sales	622,438	649,447	703,625	728,575
Cost of Goods Sold	(487,618)	(514,492)	(566,840)	(591,821)
Gross Profit	134,820	134,955	136,785	136,754
Operating Expenses				
Selling, General and Administrative	(43,695)	(44,916)	(49,746)	(51,656)
Officer Salaries	(9,025)	(9,742)	(10,906)	(11,439)
Lease Expense	(6,225)	(6,495)	(7,036)	(7,307)
Bad Debts Expense	(244)	(156)	(455)	(265)
Depreciation	(29,769)	(32,475)	(43,300)	(47,359)
Operating Profit	45,862	41,171	25,342	18,728
Interest Income (Expense)	275	241	258	200
Earnings Before Interest and Taxes (EBIT)	46,137	41,412	25,600	18,928
Interest Expense	(10,526)	(9,671)	(9,501)	(9,570)
Earnings Before Taxes (EBT)	35,611	31,741	16,099	9,358
Income Taxes	(12,108)	(10,845)	(5,473)	(3,182)
Net Income	23,503	20,896	10,626	6,176

Exhibit 3

WHITLEY MANUFACTURING COMPANY
UCA Cash Flow Statements

($ in thousands)

	2018	2019	2020
Net Sales			
Change in Account Receivables			
Cash from Sales			
Cost of Goods Sold			
Change in Inventory			
Change in Accounts Payable			
Cash Production Costs			
CASH FROM TRADING			
Selling, General and Administrative Expenses			
Other Operating Expenses			
Change in Prepaid Expenses			
Change in Accrued Expenses			
Change in Other Current Assets & Liabilities			
Cash Operating Costs			
CASH AFTER OPERATIONS			
Other Income (Expense)			
Change in Other Liabilities			
Income Tax Expense			
Change in Deferred Income Taxes			
Change in Income Taxes Payable			
Taxes Paid & Other Income (Expense)			
NET CASH AFTER OPERATIONS			
Dividends or Owners Withdrawals			
Change in Dividends Payable			
Interest Expense			
Change in Interest Payable			
Cash Financing Costs			
CASH AFTER FINANCING COSTS			
Current Portion Long-Term Debt			
CASH AFTER DEBT AMORTIZATION			
Capital Expenditures			
Change in Long-Term Investments			
Change in Intangibles/Other Assets			
Cash Used for Plant & Investment			
Related Parties - Change in Loans from Owners			

FINANCING SURPLUS/REQUIREMENT

Exhibit 3 (continued)

($ in thousands)

	2018	**2019**	**2020**
Change in Short-Term Debt			
Change in Long-Term Debt			
Change in Contributed Capital			
Other Changes in Retained Earnings			
TOTAL EXTERNAL FINANCING			
CHANGE IN CASH & EQUIVALENTS			

Appendix 1.
Some History of the UCA Cash Flow Statement and a Comparison with FASB 95

Cash flow statements are designed to examine a firm's liquidity and specifically whether the organization is generating sufficient cash from internal operations to pay interest and amortize debt (Beach, 1985-1986). The objective of the UCA method is to present a calculation of cash flow that is more useful for commercial credit analysis than its accounting counterpart, FASB 95. The UCA format was developed by Wells Fargo Bank, N.A. in the late 1970s. Wells Fargo was a participating bank in the W.T. Grant Co. credit facilities arranged by JPMorgan, N.A., but after W.T. Grant Co. failed in 1975, Wells Fargo reassessed its approach to credit analysis, leading to the development of the UCA cash flow format. It was subsequently adopted in 1982 by Robert Morris Associates (RMA), an organization founded in 1914 to promote the exchange of credit information among commercial banks, in 1982. (The organization changed its name to The Risk Management Association in 2000, maintaining the "RMA" moniker.) Several years later, in1987, the Financial Accounting Standards Board adopted its own cash flow statement which was formalized in FASB 95.

The FASB 95 cash flow format separates all the income and balance sheet items with cash flow implications into three groupings—cash flow from operating activities, cash flow from investing activities, and cash flow from financing activities. The effect of the cash flows from these three groupings is a net increase/decrease in the cash (including cash equivalents) account over the study period. But the breakdown of the FASB 95 cash flow components is largely *static* in nature as it focuses more on the composition of the three groupings and their total net effect on the firm's cash position rather than on the dynamics of the firm's cash flow through the several groupings to the cash account.

By contrast, the UCA cash flow method is intentionally *dynamic* in focus. As explained in Mulford and Comiskey (2005, p. 14), "The UCA format cash flow statement begins with collections resulting from sales made and services provided. From that opening amount labeled Cash from Sales, disbursements are deducted based on their importance to operations and priority of cash flow claims. As each disbursement is subtracted from cash collected, a subtotal is calculated that communicates whether cash collections were sufficient to cover that particular disbursement."

The different ordering of the accounts in the UCA format more accurately reflects the sequence of additions to/drains from cash generated by operations. To explain, cash from sales in the UCA format less cash production costs generates what is commonly termed Cash from Trading, from which is subtracted cash operating costs to give Cash After Operations. That account is followed by a listing of other income statement and balance sheet events that add to/drain from the cash flow generated from operations, including income taxes paid and other income (expense), financing costs, debt amortization, and capital and other investment expenditures. The effects of these latter events are captured in a continuing sequence of summary cash accounts, namely, Net Cash After Operations, Cash After Financing Costs, and Cash After Debt Amortization, eventually resulting in any Financing Surplus/Requirement.

While both the FASB 95 and UCA formats may be used to answer the four critical areas of commercial credit analysis, Beach et al. (2017) argues that the UCA method is more useful than FASB 95 owing to the dynamic presentation of a firm's cash flows in the UCA format.

In addition to commercial credit analysis, the UCA statement of cash flows can offer insight relating to the purpose(s) of a firm's short-term debt. Specifically, is the firm's short-term

debt solely intended to fund the firm's net current assets? Or is the firm increasing its risk profile by using short-term borrowing to pay the current portion of long-term debt and/or to fund, at least in part, capital (long term) assets? These questions are important to creditors for determining the purpose of any loan request or advances on an existing Revolving Line of Credit (RLOC), as well as to investors when assessing a firm's risk exposure.

Appendix 2.
The Four Critical Areas of Commercial Credit Analysis

The four critical areas of commercial credit analysis, as argued in Beach et al. (2017), are as follows:

1. *What is the Cash Source(s) for Servicing Existing Interest-Bearing Debt?*

If all the summary cash accounts (Cash After Operations, etc.) through Cash After Debt Amortization are positive, then the firm generated sufficient cash flow after taxes paid and other income (expense) to pay interest and reduce long-term debt as scheduled. This is the preferred and primary source of debt service.

If Cash After Financing Costs is positive but Cash After Debt Amortization is negative, the firm generated sufficient cash flow to cover all of its cash operating expenses, taxes paid, and other expenses including interest expense and other financing costs, but it failed to generate enough cash flow to repay long-term debt as scheduled.

If Cash After Debt Amortization is negative, leading to a Financing Requirement equal to or greater (due to long-term investments, intangibles, and other assets) than the negative Cash After Debt Amortization, then the shortfall in cash flow to cover debt service will be satisfied with either an increase in Total External Financing or a decrease in Cash & Equivalents. However, a negative Cash After Debt Amortization followed by a Financing Surplus suggests an inflow of cash from a related party(ies) such as other companies and/or owners.

In general, a company will first use its existing cash balances to cover a debt service cash flow shortfall. If such balances are insufficient, it will then look to related parties such as other companies and/or owners. The next likely source is additional short-term debt followed by new long-term debt. It should be noted that some borrowers may find it easier to draw down on a short-term line of credit rather than use existing cash balances or seek loans from related parties. Only in the direst circumstances will a firm resort to the sale of fixed assets to produce the necessary cash to pay interest expense and repay long-term debt as scheduled.

2. *Is There a Requirement for Additional Financing?*

If there is a Financing Surplus, the firm generated sufficient operating cash to meet all cash outlays related to its business including debt service and long-term investments. The amount of any such Financing Surplus will flow to the firm's Cash & Equivalents.

By contrast, a Financing Requirement represents a shortfall of operating cash flow after taxes paid and other income (expense) to meet all of the firm's business cash outlays. In such a case, if the firm does not wish to reduce its Cash & Equivalents, it will need to raise

cash from a combination of external sources in the form of short-term debt, long-term debt, and/or capital injections to meet the deficit.

3. *What is the Cause(s) of the External Financing Requirement?*

If Cash After Operations is negative, this signals a financing cause that resulted from an increase in an asset(s) associated with the firm's operations and/or an increase in an operating expense(s), albeit without sufficient operating cash flow to fund the asset and/or cover the added operating expense(s).

If Net Cash After Operations is also negative, there was insufficient cash flow after taxes paid and other income (expense) to fund the asset(s) and/or the operating expense(s) identified above. By contrast, if Net Cash After Operations was positive, the cash shortage after operations was covered by other income after taxes were paid.

If the firm continues to record negative Cash After Financing Costs, it did not have sufficient cash to cover financing costs (dividends and interest paid in cash). Moreover, a negative Cash After Financing Costs will necessarily lead to a negative Cash After Debt Amortization from paying the current portion of long-term debt.

Finally, if the Financing Requirement is more negative than Cash After Debt Amortization, there is also a long-term financing cause(s) e.g., fixed asset spending. By contrast, a Financing Surplus may indicate there is no financing cause or there is an offsetting cash inflow provided by a related party(ies) such as other companies and/or owners.

With each negative summary cash account, the task then is to use a combination of performance ratios and the UCA cash flow data to identify the event(s) that is/are driving the negative summary account.

4. *What is the Cash Source(s) to Meet the Financing Requirement?*

If Total External Financing exceeds the Financing Requirement, the change in Cash & Equivalents will be positive resulting in an increase in the firm's Cash & Equivalents.

However, if Total External Financing is less than the Financing Requirement, the firm was not able to cover its cash flow deficit with a combination of additional short-term debt, long-term debt, and/or capital injections. This indicates that the firm was compelled to use some or all of its existing cash balances to meet its cash needs for the period, resulting in a negative Change in Cash & Equivalents.

JC PENNEY VERSUS THE RETAIL APOCALYPSE: A FINANCIAL STATEMENT ANALYSIS CASE

Esther Castro & Jessie George
University of Houston-Downtown

This case allows students to leverage their financial statement analysis skills in order to save "America's Favorite Store." J.C. Penney Company Inc. (JCPenney) has been a well-known leader in the retail industry. However, the influx of online shopping has ushered in the retail apocalypse, which has been detrimental to traditional brick and mortar stores. In this case study, students will learn about the impact of the retail apocalypse, the history of JCPenney, and the strategic changes that the company has made throughout the years to remain competitive. Students will perform a financial statement analysis and make a recommendation if the company should continue on its current course or change plans to prevent becoming another victim of the retail apocalypse.

BACKGROUND INFORMATION

In 2017, the "retail apocalypse" commenced by devastating many companies (Townsend, Surane, Orr, & Cannon, 2017). Despite an economic boom, high consumer confidence, and low unemployment, several brick and mortar retail chains permanently closed their doors. According to Bloomberg, there were 553 department stores closings announced in 2017. The annual revenue for department stores were about $55 billion that same year (Dun and Bradstreet, 2018). Online retailers, like Amazon, and large big-box retailers, like Walmart, have created stiff competition for these department stores. Since 2000, department stores have seen a steady decrease in sales. Although a portion of the declining sales could be attributed to the financial recession, their sluggish response to competition has also played a role. Department store sales are highly cyclical and heavily dependent on holiday shoppers. A third of their sales are likely to be generated in the fourth quarter. With the ease of online shopping and the creating of Cyber Monday, consumers are shopping less frequently at traditional department stores.

Many of these department stores are burdened with substantial debt and are struggling to make timely payments. In 2017, a long list of retail stores filed for Chapter 11 bankruptcy (Ruff & Unglesbee, 2017). This list includes stores such as RadioShack, Payless Shoe Source, Rue21, Aerosoles, and the most significant bankruptcy, "Toys "R" Us. Even historically-stable department stores, like Macy's, are laden with billions of debt. After the bankruptcy of Toys "R" Us, refinancing has become more challenging. With refinancing becoming harder and competition stiffer, these companies may not have any choice but to follow Toys "R" Us to bankruptcy. The retail apocalypse is not over, and it seems to be encroaching at the doorstep of JCPenney.

JCPenney has grown to be one of the largest home and apparel retailers (J.C. Penney Company, Inc., 2018c). The company has grown extensively since its humble beginnings. In 1902, Mr. James Cash Penney founded JCPenney. The organization has grown to over 850 stores and employs over 95,000 associates nationwide. In order to stay in business for over 100 years, JCPenney has had to adapt its business strategy to reflect the changing marketplace. In the 1960s, the company published its first sales catalog. About 30 years later, JCPenney was one of the retail pioneers who embraced e-commerce by launching jcpenney.com (J.C. Penney Company, Inc., 2020).

However, not all of the company's changes had a positive impact. In 2011, Ron Johnson, the Chief Executive Officer (CEO), launched a rebranding of JCPenney as "America's Favorite Store." His new branding was more about the hip, new styles, and less about quality clothing at affordable prices (Wahba, 2016). Unfortunately, this change was a complete fail. Johnson alienated his loyal customers by changing brands and eliminating discounts. In addition, the rebranding did not attract a new customer base. During Johnson's 17-months tenure, sales plummeted by about $6 billion, the workforce was reduced by 40,000 employees, and the share price fell dramatically.

After Johnson was fired, the former CEO Myron Ullman returned to fill the vacated role. Ullman's first set of business was to stabilize JCPenney through reversing Johnson's actions (Ladd, 2018). He restored the company's well-loved brands and reintroduced discounts and promotions. However, his efforts were deemed ineffective, as many of JCPenney's loyal customers flocked to alternatives, like Amazon and Walmart, during the Johnson debacle.

In 2015, Marvin Ellison took over as CEO. He was committed to restoring JCPenney and updating their market approach. The company developed a three-prong strategy, which included focusing on its private brand, omnichannel retailing (mobile), and revenue per customer. The objective of this plan was to increase sales and profitability while controlling costs. To increase revenue, Ellison successfully partnered with Sephora to create 'Salon by InStyle'. As part of this restructuring, he also expanded the home and appliance departments (Duprey, 2018). Despite its robust focus on growth, the company continued to reduce costs. From 2017 - 2018, JCPenney closed 138 stores and reduced the workforce by 360 positions (J.C. Penney Company, Inc., 2018a). As a result of these changes, JCPenney was able to retire $1.4 billion in debt. Unfortunately, JCPenney still has a total obligation of $4.232 billion remaining.

Students will perform a financial statement analysis to determine if JCPenney needs a new strategic direction or if Ellison's actions were enough to turn JCPenney around and save the company from the retail apocalypse?

ANALYSIS

Financial statements and the industry averages are provided in Exhibits 1-3. After completing the financial analysis, write a summary that highlights critical areas of concern for JCPenney. Determine if management should continue their current business strategy or change their course of action to prevent JCPenney from becoming the next victim of the retail apocalypse. The analysis should include:

- Vertical analysis of income statement and balance sheet
- Horizontal analysis of income statement and balance sheet
- Complete Ratio Analysis and Industry comparison. For each area, the students need to determine if the company is in an improved or worsening financial position.

  - Liquidity
  - Asset management
  - Debt management
  - Profitability
- A written summary of the company's financial position and a decision of whether JCPenney should continue their current course of action or change direction.

Exhibit 1

JCPenney's Income Statement

(In millions, except per share data)	2017	2016	2015
Total net sales	$12,506	$12,547	$12,625
Costs and expenses/(income):			
Cost of goods sold (exclusive of depreciation and amortization shown separately below)	8,174	8,071	8,074
Selling, general and administrative (SG&A)	3,468	3,538	3,775
Pension	21	19	162
Depreciation and amortization	570	609	616
Real estate and other, net	-146	-111	3
Restructuring and management transition	303	26	84
Total costs and expenses	12,390	12,152	12,714
Operating income/(loss)	116	395	-89
Loss on extinguishment of debt	33	30	10
Net interest expense	325	363	405
Income/(loss) before income taxes	-242	2	-504
Income tax expense/(benefit)	-126	1	9
Net income/(loss)	**-116**	**1**	**-513**
Price	$3.16	$8.31	$6.66
Earnings/(loss) per share:			
Basic	-0.37	—	-1.68
Diluted	-0.37	—	-1.68
Weighted average shares – basic	311.1	308.1	305.9
Weighted average shares – diluted	311.1	313	305.9

Source: J.C. Penney Company, Inc., 2018b

Exhibit 2

JCPenney's Balance Sheet

(In millions, except per share data)	2017	2016	2015
Assets			
Current assets:			
Cash in banks and in transit	$116	$125	$119
Cash short-term investments	342	762	781
Cash and cash equivalents	458	887	900
Merchandise inventory	2,762	2,854	2,721
Prepaid expenses and other	190	160	397
Total current assets	3,410	3,901	4,018
Property and equipment	4,281	4,599	4,816
Prepaid pension	61	—	—
Other assets	661	618	608
Total Assets	**$8,413**	**$9,118**	**$9,442**
Liabilities and Stockholders' Equity			
Current liabilities:			
Merchandise accounts payable	$973	$977	$925
Other accounts payable and accrued expenses	1,119	1,164	1,360
Current portion of capital leases, financing obligation and note payable	8	15	26
Current maturities of long-term debt	232	263	101
Total current liabilities	2,332	2,419	2,412
Long-term capital leases, financing obligation and note payable	212	219	10
Long-term debt	3,780	4,339	4,668
Deferred taxes	143	204	425
Other liabilities	567	583	618
Total Liabilities	7,034	7,764	8,133
Stockholders' Equity			
Common stock (1)	156	154	153
Additional paid-in capital	4,705	4,679	4,654
Reinvested earnings/(accumulated deficit)	-3,122	-3,006	-3,007
Accumulated other comprehensive income/(loss)	-360	-473	-491
Total Stockholders' Equity	1,379	1,354	1,309
Total Liabilities and Stockholders' Equity	**8,413**	**9,118**	**$ 9,442**
Shares Outstanding (in million)	312	308.3	306.1

Source: J.C. Penney Company, Inc., 2018b

Exhibit 3

Industry Averages

Liquidity Ratios

	2017
Current Ratio	1.55
Quick Ratio	0.35

Asset Management Ratios

	2017
Total Asset Turnover	1.50
Fixed Asset Turnover	4.00
Inventory Turnover	3.88
Inventory Turnover in Days	93.99

Debt Management Ratios

	2017
Liabilities to Asset	70.60%
Times Interest Earned (TIE)	4.55

Profitability Ratios

	2017
Operating Profit Margin	6.36%
Profit Margin	4.21%
Return on Assets (ROA)	8.46%
Basic Earning Power (BEP)	11.67%
Return on Equity (ROE)	29.28%

Profitability Ratios

	2017
Price/Earnings (P/E)	14.02
Market to Book	4.57

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MUTUALLY-EXCLUSIVE CHOICE BETWEEN A HYBRID AND AN ALL-ELECTRIC CAR: A CAPITAL BUDGETING ANALYSIS

Charlie Charoenwong, Nanyang Technological University
Chee K. Ng, Ithaca College

In the pathway to a more sustainable economy, choosing between a hybrid car and an all-electric car can be an inevitable transitional step for many consumers. This decision-making process parallels a typical problem in capital-budgeting analysis known as the mutually exclusive decision. We first use the mutually-exclusive binary decision to buy either a Toyota Prius or a Chevy Bolt to conduct a capital-budgeting base-case analysis using the various traditional techniques. We next delve deeper into the decision-making process by conducting a sensitivity analysis on pairs of variables that have policy implications.

INTRODUCTION

The pathway to green manifests itself as a mutually-exclusive choice between a hybrid car which entails fossil fuel directly and an all-electric car which doesn't. This exercise frames the decision-making process into a typical mutually-exclusive capital budgeting analysis. We choose Toyota Prius as the hybrid car and the Chevy Bolt as the all-electric car. Nora Naughton (*The Wall Street Journal*, Eastern edition, March 8, 2021, p. B1) reported the Chevy Bolt to be the second most popular electric vehicles sold in USA in 2020, losing only to Tesla which was in another price league compared to the Toyota Prius. Hence, we choose the Chevy Bolt instead of the Tesla Model 3.

In March 2021, a brand-new Toyota Prius LE sells at $25,735 as its manufacturer suggested retail price inclusive of delivery charge to the NY-NJ-CT tri-state area. The corresponding retail price for a brand-new Chevy Bolt is at $28,995.

The Prius has a city-highway combined efficiency of 52 miles per gallon. For the base-case analysis, let's assume a gas price at $3.00 per gallon. This will result in a mileage efficiency of 5.76923 ¢/mile.

The Bolt has an efficiency of 3.448275 miles/kWh. For base-case analysis, let's assume electricity supply at a price of 12 ¢/kWh. This will result in a mileage efficiency of 3.48 ¢/mile. We obtain the 3.448275 miles per kWh statistic from www.fueleconomy.gov, a federal agency website, which shows the 2021 Chevy Bolt model at an efficiency of 29 kWh per 100 miles.

For simplicity of analysis, let's assume an individual needs to drive 12,000 miles a year or 1,000 miles a month for work, school, and other transportation needs. Let's further assume the same individual faces an auto loan's interest rate of 3% per year or 0.25% per month.

THE ANALYSIS

We first perform a base-case analysis using the data provided or assumed so far.

Q1: Calculate the monthly cash flows for purchasing and operating the Prius for 15 years.

Q2: Calculate the monthly cash flows for purchasing and operating the Bolt for 15 years.

Q3: From the monthly cash flows in the previous two questions, derive the *incremental* cash flows of purchasing the more expensive Chevy Bolt over the less-expensive Prius for 15 years or 180 months.

Q4: From the incremental cash flows established in Q3 above, find the following capital-budgeting measures.

i. undiscounted payback in years;
ii. discounted payback in years;
iii. net present value, NPV, in $;
iv. internal rate of return, IRR, in %;
v. profitability index, and;
vi. modified internal rate of return, MIRR, in %. Use reinvestment rate of 1% per annum or .08333% per month.

Next, we perform 2-variable sensitivity analyses over ranges of plausible values for the two variables by calculating the discounted payback period which is simply the number of years to breakeven the extra $3,260 upfront payment for the all-electric Chevy Bolt. For the Prius, we choose gas price as the variable for a range of 2.00 $/gallon to 6.00 $/gallon over a 50-¢ increment. For the Bolt, we choose three variables, namely electricity supply rate from 8 ¢/kWh to 16 ¢/kWh, the interest rate from 0% to 6% per year, and tax rebate for buying the electric car from $0 (the base-case analysis above) to $2,500 at $500 increment. Beware of the #NUM! output generated by the time-value-of-money functions in Excel's **Data**, **What-if Analysis**, **Data Table** mode. They are not spurious output but do have their own significant financial interpretation. Those who need help with the Data Table function in Excel, please refer to the Appendix where a similar numerical example is presented as a learning illustration.

THE RESULTS

We expect three output tables, as follows:

Table 1: Discounted payback, in years, of an all-electric Bolt over the hybrid Prius at various gas prices and various electricity supply charge rates.

		Gas price, $/gallon								
		2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
Electricity rate, ¢/kWh	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
	16									

Table 2: Discounted payback, in years, of an all-electric Bolt over the hybrid Prius at various gas prices and various auto loan interest rates.

		Gas price, $/gallon								
		2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
Interest rate, % p.a.	0									
	1									
	2									
	3									
	4									
	5									
	6									

Table 3: Discounted payback, in years of an all-electric Bolt over the hybrid Prius at various gas prices and various tax credit levels.

		Gas price, $/gallon								
		2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
Tax credit for electric car, $	0									
	500									
	1500									
	2000									
	2500									
	3000									

Q5: What does the output #NUM! mean financially in Table 1 if you change the price spread from $3,260 to $5,000? How do the negative numbers in Table 1 come about, especially since discounted payback period cannot be negative intuitively? Explain the difference between #NUM! and negative numbers in Table 1. Hint: think along the line of PV(perpetuity) = Annuity/i.

Now, change the price spread back to $3,260 before answer the following questions.

Q6: From Table 1, make two *ceteris paribus* statements on the discounted payback on each variable. Then, make another combined statement on discounted payback's trend based on both variables.

Q7: From Table 2, make two *ceteris paribus* statements on the discounted payback on each variable. Then, make another combined statement on discounted payback's trend based on both variables.

Q8: From Table 3, make two *ceteris paribus* statements on the discounted payback on each variable. Then, make another combined statement on discounted payback's trend based on both variables.

APPENDIX

We illustrate the use of Excel's Data Table function to generate a 2-variable sensitivity analysis for a saver who plans to amass $1million by depositing $x monthly into an account that earns y% per year. We let x assume its range values of $250, $500, $750, and $1,000 per month in deposit. We let y take its range values of 3%, 6%, 9%, and 12% return earned per year.

	A	B	C	D	E	F	G	H
1	FV	1000000		40.065	0.03	0.06	0.09	0.12
2	Mthly deposit, x, in $	500		250	80.030	50.869	38.298	31.101
3	Ann int rate, y, in %	0.06		500	59.800	40.065	30.922	25.498
4	Years needed for $1m	40.065		750	48.939	34.033	26.743	22.299
5				1000	41.811	29.937	23.868	20.082

Entries in the Excel spreadsheet are:

All contents in column A, cells B1 through B3, E1 through H1, and D2 through D5 are manually input. In cell B4, enter **=nper(B3/12,-B2,0,B1,0)/12**. In cell D1, enter **=B4**. Next, we **select cells D1 through H5** which are now highlighted. Next, we click the "**Data**" tab on top row of the spreadsheet, followed by "**What-if Analysis**," and "**Data Table**" sequentially. This will cause a window to pop up where we will enter **B3** for "Row input cell," and **B2** for "Column input cell." Clicking the **Ok** icon in the pop-up window will yield all the outputs in cells E2 through H5. These are the results for the number of years the saver needs to amass $1m at the corresponding interest rate and monthly deposit. For example, at 6% per year, and 500 $/month deposit, the saver needs 40.065 years to amass $1m. Using the Texas Instruments BA II Plus Professional financial calculator for verification, we'll enter I/Y = 6÷12 = 0.5; PMT = –500; FV = 1,000,000; CPT N = 480.777 months = 40.065 years which is exactly the answer in cells B4, D1 and F3.

LOCKWELL ENTERPRISES: A CASE FOR CONSTRUCTING GOVERNMENT BIDS

Wesley Jones & Susan Wright
The Citadel, The Military College of South Carolina

This case requires students to determine the minimum bid amount to win a government contract for the production of medium-range, tactical fighter jets/bombers. Students construct multi-year cash flows related to the start-up phase and contract phase of the project and determine the present value, internal rate of return, and payback period of the cost stream associated with the contract. To determine the minimum bid amount, students use Goal Seek in Excel to solve for the bid-price by forcing the NPV equation to zero (break-even price). There are a lot of interesting elements and solving the case is challenging. Students will experience the integration of many of the concepts they have learned in an upper division or graduate level finance course. To complete the case, students consider qualitative as well as quantitative aspects in their analysis. A final requirement involves the development of a persuasive presentation to pitch recommendations to a group of non-financial managers to win the bid.

LOCKWELL ENTERPRISES

You are charged with the responsibility of developing a bid for your company, Lockwell, Enterprises, on a government contract to produce the newest generation of medium range, tactical fighter/bombers designated as the XF25. The contract you will be bidding on calls for the guaranteed purchase of 250 of the new aircraft. If the bid is accepted, it will take your firm five years to tool up for full scale manufacture of the XF25 (pre-contract phase is considered years 0, 1, 2, 3, 4). During the start-up phase, research and development of the XF25 is expected to cost $75 million per year for five years, starting immediately (period 0). The tooling costs (cost of new machinery and other depreciable assets) will be $500 million (incurred in year 4 of the start-up phase). To simplify the analysis, use 5-year straight line depreciation with a salvage value equal to zero. The tooling assets used to build the new fighter will have a market value of $20 million at the end of the contract period (year 9). To produce the new fighter, raw material inventory will increase by $600 million and Lockwell's suppliers will extend an additional $300 million in trade credit to support inventory purchases. Both working capital adjustments occur in year 4. The ramp up of raw material inventory and the additional trade credit is liquidated in the last year of the contract phase (year 9). The aircraft will be delivered at a rate of 50 per year for 5 years during the contract life and the first payment for aircraft delivery will occur at the end of the year immediately following retooling (year 5). If your company wins the bid, you have estimated that changes will occur to Lockwell's annual fixed cost structure during the contract period (years 5-9) as shown in Exhibit 1:

Exhibit 1. Changes to Fixed Cost Structure

Expense Item	*Current Level*	*Projected Level*
Administration	$250,000,000	$272,000,000
Legal	$55,000,000	$75,000,000
Miscellaneous	$16,000,000	$24,000,000

Each aircraft will be produced from start to finish by a work group consisting of three crews working 3 eight-hour shifts per day 5 days per week. Engineering standards indicate that a qualified work group can complete a plane every 9 weeks on this schedule. The make-up of the work group is shown in Exhibit 2. Direct material cost for each aircraft total $60 million.

Exhibit 2. Work Crew Characteristics

Worker Classification	*Number per Shift*	*Hourly Wage Rate*
A&P Mechanic	23	$52.00
Electrician	23	$53.00
Composite Specialist	43	$45.00
Avionics Technician	11	$52.00
Painter	11	$45.00
Computer Specialists	11	$49.00
Autoclave Operator6	6	$44.00
Casual Labor	57	$40.00

Lockwell's current capital structure is shown in Exhibit 3. This structure is consistent with their targeted long-term capital structure.

Exhibit 3. Target Financial Structure

Long Term Debt	$27,000,000,000
Common Equity	$33,000,000,000
Total	$60,000,000,000

Lockwell's long-term debt consists of a non-callable bond issue with the characteristics shown in Exhibit 4.

Exhibit 4. Bond Characteristics

Par Value	$1,000 per bond
Effective Maturity	17 years
Annual Coupon Rate	12%
Coupon Frequency	Semi-annual

The bond issue was reported yesterday in *The Wall Street Journal* at a price of 116.043% of par. New 5-year debt will incur a 370-basis point flotation cost. (1 basis point = 0.01%). Lockwell's stock paid a dividend yesterday of $5.34. This dividend represented an 8% increase over one year earlier. Analysts in the market predict that the 8% growth will be maintained into the foreseeable future. Wall Street Journal yesterday quoted Lockwell stock at a price of $48.50. Lockwell will not rely on retained earnings for this project. New Stock will incur a 15% flotation cost. Lockwell is in the 40% marginal tax bracket.

CASE QUESTIONS

1. Calculate the weighted average cost-of-capital, r_{wacc}, for Lockwell given its targeted capital structure. Assume all flotation costs are deducted from the current market price of each class of securities.
2. Calculate the expected direct labor cost per plane given the information provided in the case. Convert to a per million value.
3. What is the lowest acceptable price for the XF25 that Lockwell should bid? Use Goal Seek in Excel to obtain the answer. Calculate the internal rate of return and the payback period at this price. (Lump the initial startup costs together as the initial investment for the payback period calculation).
4. What do you think the company should bid for the contract? Consider the internal and external risks including errors in the cost projections. Back up your recommendation with quantitative as well as qualitative considerations. Here are two links to articles that provide insight on qualitative factors that are important to winning contracts. Feel free to find and use additional information in developing your recommendation. Cite your references.
   https://www.constructconnect.com/blog/key-factors-consider-bidno-bid-decision-making
   https://www.bizfilings.com/toolkit/research-topics/running-your-business/government-contracting/what-happens-after-you-place-a-bid-on-a-government-contract
5. Develop a convincing presentation to pitch your recommendation to a group of non-financial managers to win the bid for your company to produce the fighter jets. Emphasize both quantitative and qualitative considerations in building your proposal.

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A PRIMER ON THE CAUSES & CONSEQUENCES OF THE (CONTINUING) FINANCIAL CRISIS[1]

Tim Michael & Melissa Williams
University of Houston-Clear Lake

THE SUBPRIME MORTGAGE CRISIS

In the 1970s and 1980s, Freddie (FHLMC) and Fannie (FNMA) (hereafter F&F) were available to help securitize home loans and distribute the geographic (concentration) and extension (long-term fixed rates) risks that banks faced from holding mortgages. The policy reasons behind F&F were sound, as created. The whole push for home ownership at the largest level possible was designed to provide incentives for people to invest in and maintain their communities.

Although the origin of the phrase is unclear, it remains apt for describing the agency problem: *Nobody ever washed a rented car*.[2] In other words, the contract that a homeowner has with society is stronger than the contract that a renter or transient has with society and the community in particular; ownership adds value to a community and society in general.

F&F, and to a lesser extent the Federal Home Loan Bank system and GNMA, provided tangible benefit to the housing market and home ownership in this country through the early 1990s. If nothing else, they encouraged an unprecedented level of standardization in loan documentation and appraisal. They also provided a way for small and regional institutions to diversify their credit risk exposure from mortgages - they could sell their loans to Freddie or Fannie and buy geographically diversified mortgage-backed securities with very high ratings.

Beginning sometime in 1991 or 1992, however, FHA (the ex-officio parent of Fannie) and HUD took a special interest in developing market for those folks who didn't have access to traditional, full-down-payment mortgages. That was historically the role of both the Veterans Administration mortgage insurance and FHA programs, but policymakers decided that there should be some social engineering component to those programs that transcended traditional lending doctrine. So from the early 1990s, and continuing until the present, politicians have held considerable influence on mortgage markets to make sure that they created lending programs for homebuyers that had less than perfect credit or were somehow economically disadvantaged by not having enough income. FHA, in particular, began to commit funds to a substantial number of households with incomes below the local or regional median.

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[1] This discussion was originally compiled in late 2010 in order to inform students and the community regarding the ongoing crisis, and we have kept it in this context for review and publication. The authors would like to acknowledge contributions and comments from a multitude of readers and conference participants, many of whom have asked for permission to distribute this to their students or use it in class over the past dozen years.

[2] The Internet provides an origin for this phrase via Thomas Friedman and Lawrence Summers, but ultimately from an Air Force NCO in the 1980s regarding airplane maintenance.

As acknowledged in the conference version of the Dodd-Frank Financial Reform Bill (2010):[3]

> *(2) In 1996, the Department of Housing and Urban Development required that 42 percent of Fannie Mae's and Freddie Mac's mortgage financing should go to borrowers with income levels below the median for a given area.*
>
> *(3) In 2004, the Department of Housing and Urban Development revised those goals, increasing them to 56 percent of their overall mortgage purchases by 2008, and additionally mandated that 12 percent of all mortgage purchases by Fannie Mae and Freddie Mac be "special affordable" loans made to borrowers with incomes less than 60 percent of an area's median income, a target that ultimately increased to 28 percent for 2008.*
>
> *(4) To help fulfill those mandated affordable housing goals, in 1995 the Department of Housing and Urban Development authorized Fannie Mae and Freddie Mac to purchase subprime securities that included loans made to low-income borrowers.*
>
> *(5) After this authorization to purchase subprime securities, subprime and near-prime loans increased from 9 percent of securitized mortgages in 2001 to 40 percent in 2006, while the market share of conventional mortgages dropped from 78.8 percent in 2003 to 50.1 percent by 2007 with a corresponding increase in subprime and Alt-A loans from 10.1 percent to 32.7 percent over the same period.*
>
> *(6) In 2004 alone, Fannie Mae and Freddie Mac purchased $175,000,000,000 in subprime mortgage securities, which accounted for 44 percent of the market that year, and from 2005 through 2007, Fannie Mae and Freddie Mac purchased approximately $1,000,000,000,000 in subprime and Alt-A loans, while Fannie Mae's acquisitions of mortgages with less than 10 percent down payments almost tripled.*
>
> *(7) According to data from the Federal Housing Finance Agency (FHFA) for the fourth quarter of 2008, Fannie Mae and Freddie Mac own or guarantee 75 percent of all newly originated mortgages, and Fannie Mae and Freddie Mac currently own 13.3 percent of outstanding mortgage debt in the United States and have issued mortgage-backed securities for 31.0 percent of the residential debt market, a combined total of 44.3 percent of outstanding mortgage debt in the United States.*
>
> *(8) On September 7, 2008, the FHFA placed Fannie Mae and Freddie Mac into conservatorship, with the Treasury Department subsequently agreeing to purchase at least $200,000,000,000 of preferred stock from each enterprise in exchange for warrants for the purchase of 79.9 percent of each enterprise's common stock.*
>
> *(9) The conservatorship for Fannie Mae and Freddie Mac has potentially exposed taxpayers to upwards of $5,300,000,000,000 worth of risk.*

[3] The final version is formally known as the "Dodd–Frank Wall Street Reform and Consumer Protection Act." Some versions of the bill do not contain the cited language.

(10) The hybrid public-private status of Fannie Mae and Freddie Mac is untenable and must be resolved to assure that consumers are offered and receive residential mortgage loans on terms that reasonably reflect their ability to repay the loans and that are understandable and not unfair, deceptive, or abusive.

(b) SENSE OF THE CONGRESS.—It is the sense of the Congress that efforts to enhance by the protection, limitation, and regulation of the terms of residential mortgage credit and the practices related to such credit would be incomplete without enactment of meaningful structural reforms of Fannie Mae and Freddie Mac.

(H.R. 4173, Section 1491, page 2205)

"Encouraging" private market participation and the involvement of the banking system was done in several ways. One was through the Community Reinvestment Act (CRA). Passed in 1977, and refined many times since then, the CRA, along with the bookkeeping requirement on the demographics of bank customers mandated by the Home Mortgage Disclosure Act of 1975, require banks to lend in the areas where they actually take deposits. It bans the practice of "redlining" particular areas, which was a racially-biased lending practice associated with home mortgages.[4] Throughout the 80s and 90s it was common practice for regulators to encourage the development of "underserved" markets and to promote services and concessions to "the unbanked." Banks that couldn't lend into economically disadvantaged areas, for whatever reason, were allowed to donate funds to community organizations within those representative demographics to comply with regulatory pressures. CRA compliance was eventually refined and included in the Gramm-Leach-Bliley Act of 1999 - firms that wanted to expand their business scope and diversify across industries (and compete effectively with their offshore counterparts) would have to rate a "Satisfactory" for CRA for each subsidiary, and losing that regulatory designation would cause them to also lose access to the "Financial Holding Company" status and its advantages over time.

Another regulatory "push" toward F&F is documented by Friedman (2009) as being part of the FDIC Improvement Act of 1991 and the gradual implementation of the initial Basel Accord capital standards (Basel I). The measurement of a bank's risk-weighted assets would require more capital if the bank held the actual mortgages than if the bank sold the mortgages to Freddie or Fannie.[5] The difference is slight, but for smaller banks the struggle to raise equity can be substantial. Small bank exposure to Freddie and Fannie bond downgrades and the requirement that these securities be carried at fair value has been cited as leading to bank failures in at least one instance during the current crisis. The first-ever use of an offshore merger partner

[4] Munnell, et al. (1996) and Tootell (1996) were among the first studies to examine post-1989 HMDA data, which included records of denials of loans as well as loans granted. Brimelow and Spencer (1993) and other popular writers challenged these results almost immediately. Benston (1999) discusses this from an academic perspective.

[5] This is clearly outlined in several editions of Koch and MacDonald dating back to the early 1990s. To our knowledge, Friedman (2009) and Acharya & Richardson (2009) are the first studies to discuss this relationship in an academic context.

in a purchase-and-assumption bank rescue, during 2009, occurred at least in part because of Freddie and Fannie holdings.[6]

Once F&F had a dominant role in the market, two aspects drove the moral hazard that ended in disaster. First, there was an implicit guarantee, even though neither of these was a government entity, technically. Yields on market trades indicate, over time, that most investors considered F&F securities to be nearly equivalent to US Treasuries of the same maturity. Second, the structure of the underlying securities meant that rating agencies, and buyers, and sellers in some cases, had difficulty understanding not only how to value these products but also how to model their risks after creation.[7] The issuing banks knew far more about the risk of these securities than did any other party in the market.

At the same time, banks were perfecting the "originate-to-distribute" model for mortgage underwriting and selling them as quickly as possible, especially subprime mortgages. Loans that were made in this fashion were less likely to be screened properly for risk, and lenders focused on the quantity of loans securitized rather than their quality. In many cases, this type of quantity lending was incentivized by compensation practices, letting bankers score higher bonuses for booking more loans in a lending culture based mainly on current profit considerations.[8] Even for healthy loans, banks created structured investment vehicles in order to move their underwriting of mortgage-backed securities off of their balance sheets, and then supplied the necessary "liquidity enhancements" (guarantees) to obtain high ratings and encourage investor interest.

The ratings agencies capitulated by assuming that the implicit guarantee was enough for deals related to Freddie and Fannie, and that large institutions' guarantees were enough for the rest. In fact, some former analysts have asserted that they collectively threw up their hands and decided to "let the market figure it out."[9,10] Because these products were uniformly rated as "investment grade," it allowed many different counterparties, some with scant knowledge of the risks (or a perceived need to understand on their part) to purchase securities backed by subprime home mortgages. This, evidently, occurred en masse. The problems of faulty ratings exacerbated what Alan Greenspan has termed "[t]he collapse of private counterparty credit surveillance, fine tuned over so many decades."[11] On top of this, beginning in 2004, the large commercial banks underwriting these securities began to concentrate their holdings of the same securities - they were rated highly, so why not?[12]

These ratings were recognized as flawed by market participants, and they turned to the market for credit default swaps. Originally designed in the late 1990s, CDS allowed a pension

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[6] Guaranty Bank of Austin, TX, was absorbed by BBVA in 2009-2010 due to $1.7 billion in book losses from revaluing mortgage-backed securities involving Freddie and Fannie. (*Houston Business Journal*, June 29, 2009)

[7] Here contract design (agency friction) rears its ugly head.

[8] Koch & MacDonald (2011) discuss this in their Commercial Lending chapter.

[9] See Chittum (2009) for an interview with Mark Pittman, Bloomberg reporter and the first person to successfully sue the Federal Reserve (over disclosure of borrowing relationships). Pittman (2007a, 2007b) documents the growth and exposure of the subprime business.

[10] Smith (2008) cites Joseph Stiglitz as holding the ratings agencies accountable: "They were the party that performed that alchemy that converted the securities from F-rated to A-rated. The banks could not have done what they did without the complicity of the ratings agencies."

[11] Greenspan (2010).

[12] Acharya & Richardson (2009)

manager or a hedge fund to purchase "insurance" on the bond position they were taking.[13] Unfortunately, there was little transparency in this market, and some creators (such as AIG) sold multiple contracts covering the same bonds to multiple parties. Lacking regulatory disclosure and accounting transparency, and faced with underlying securities from F&F and other highly-rated issuers, writing many of these at once didn't seem like such a bad idea.[14]

The supply and demand for structured products disappeared. If ratings couldn't be trusted on secured financings such as mortgage-backed obligations, then certainly ratings couldn't be trusted on something as complicated as asset-backed commercial paper. In mid-2007, the Federal Reserve grew concerned and began to figure out ways to supplement the liquidity of the market with short-term monies and keep overnight rates from spiking. Eventually, Fed services were extended to several firms (GMAC, for example) who had been reliant on commercial paper for their livelihood -- these firms were allowed to become bank holding companies and therefore receive direct assistance or assistance under a broader rubric such as the Trouble Asset Relief Program or TARP.

For consumers, the focus on subprime lending and the quantity of (implicitly) federal guarantees into the real estate market drove housing prices upward. As the "guaranteed" money poured into real estate markets in California, Arizona, Nevada and elsewhere, home prices continued to increase. In some parts of the country entire neighborhoods were built without consideration of the transportation costs of the residents or the proximity of gainful employment, resulting in "ghost towns" after the drop in value came about in 2008-2009.[15] Lower income homebuyers were encouraged to take out loans without documentation of income, or they were led into adjustable-rate mortgages (ARMs) that reflected interest-only payments or low initial "teaser" rates that reset after 18-24 months to an amortizing payment or higher, market-based rate. Another popular type of loan, an "option ARM," actually allowed borrowers to decide, each month, how much they would pay on the mortgage (while increasing principal by the unpaid amount). Mortgage lender Golden West even bragged that they could successfully make loan decisions based on the appraised value of the homes themselves rather than on the borrower's ability to repay.[16,17]

Another likely force driving market prices, and ultimately, defaults, was home speculation and "Alt-A" lending.[18] Loans known as "Alt-A" mortgages also suffered losses after being securitized; Alt-A loans are for those folks in the middle range of creditworthiness, but frequently this type of loan is either put on top of a primary mortgage to allow borrowers to put less money down (and to avoid monthly payments for private mortgage insurance), or Alt-A loans can be used to fund repairs on speculative properties or to purchase them altogether.

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[13] We must be clear here – CDS are not insurance contracts, because if they were insurance contracts they would be regulated at the state level. See Wallison (2009c).

[14] Wallison (2009b) argues that the CDS market shouldn't be held responsible for the crisis. Our argument isn't that they were a primary causal factor, but that they were a result or symptom. (continued) Additionally, it is our assertion that the devaluation of ratings credibility or certification (as reflected by the growth of the market for swaps) will have more damaging effects over time than the CDS market itself.

[15] Semuels (2010).

[16] Ivry (2008). Foust (2008) discusses Golden West's "innovative" approach to lending analysis.

[17] To avoid charges of predatory lending, Wachovia began taking extra measures to "educate" borrowers about the risks of option ARMs and other negative-amortization products beginning in June of 2008. See Mildenberg (2008) and Pearlstein (2007).

[18] Liebowitz (2009).

Liebowitz (2009) documents the impact of this type of loan, and negative equity in general, on the crisis and finds that Alt-A financings were perhaps more of a problem than subprime loans in many markets (see Figure 1).[19] Using Alt-A loans to reduce down payments increases the chance that borrowers will be exposed to negative equity if market prices drop.

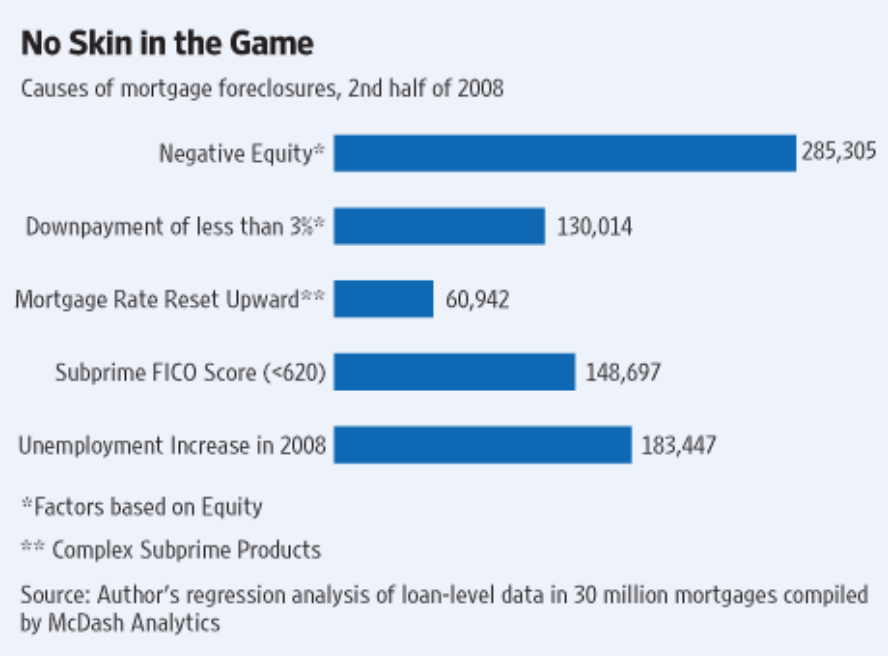

Figure 1. Source: Liebowitz (2009), The Wall Street Journal.

Some Other Consequences of the Crisis

In 2008, Bear Stearns and AIG were bailed out to prevent disruptions and potential contagion in markets; they were deemed "Too Big To Fail."[20] Lehman Brothers was allowed to collapse to prevent further moral hazard, and Merrill Lynch was merged into Bank of America, who had capital shortages itself and was relying on the government for preferred equity funding

[19] See Liebowitz (2009) and Liebowitz (2008) as well as Wallison (2009b). "Alt-A" has many definitions these days, but the term comes from a loan's priority relationship with the primary loan in commercial lending transactions, the "A" loan. Any additional financing then considered reasonable within lending guidelines would be "Alt-A." In the authors' experience, this was how the term was used in practice in the 1990s.

[20] "Too Big To Fail" was used in 1987 to describe the impending collapse of Continental Illinois, a Chicago state-chartered bank with extensive overseas funding issues and poor investments in energy assets. For a comprehensive analysis of this bailout, see FDIC (1997). In this case, it was the issue of counterparty exposure and contagion that drove the decision to extend additional credit and keep the bank open, which is the same argument used recently. The moral hazard of Continental Illinois has been linked to the merger boom of the 1980s and early 1990s following the Garn-St. Germaine Act of 1982 and the CEBA of 1987.

under the TARP/CPP.[21] For consumers, FDIC increased insurance on individual deposit accounts to $250,000 (from $100,000) and the Bush Administration extended the same protection to money market mutual fund accounts to prevent mass withdrawals.

Washington Mutual (known in the press, affectionately, as "WaMu"), the largest "zombie" bank in the country, was finally bought by J.P. Morgan/Chase in 2009, after bleeding capital and disrupting its consumer markets for several years.[22] WaMu was notorious for charging low fees, paying high rates, and originating mortgage and other consumer loans with little or no documentation.

Wachovia finally succumbed to the "option ARM" troubles it bought with Golden West in 2006 and ended up being merged into Wells Fargo. Ironically, Wachovia, founded in North Carolina, was widely known for its conservative lending practices throughout most of the last century.

Finally, the TARP itself was used to renegotiate the ownership of General Motors and Chrysler in order to prevent the macroeconomic shocks that would inevitably occur if those firms were allowed to go under. At the same time, bondholders in both firms were assigned tremendous losses. The reformed General Motors planned an initial public offering of new shares in late 2010.

HOW WILL THINGS CHANGE BECAUSE OF THE CRISIS?

For Consumers

Since the crisis began, consumer finance and housing markets have witnessed new trends that will likely continue. For example, the idea of strategic default, or just walking away from a home that has fallen in value, has become commonplace and has generated a great deal of discussion about the moral aspects of leaving one's community "high and dry."[23] Other workout arrangements such as "short sales" have become popular, and institutions have set aside resources to make these services more readily available.

Home lender Freddie Mac has asked borrowers to consider the "externalities" of strategic default and how it might hurt the community and society in general.[24] In fact, as Don Bisenius of Freddie Mac points out, faced with a higher incidence of strategic defaults

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[21] The TARP Capital Purchase Program was used to legitimize US Treasury purchases of preferred shares from Bank of America, JP Morgan/Chase, Citibank and other large financial holding companies. Under the funding agreement, these shares must be repurchased with equity proceeds and not retained earnings or surplus. Additionally, those banks that don't repay quickly enough will end up with two board members appointed by the Treasury. See Thiruvengadam (2009).

[22] It is important to distinguish here between "zombie" institutions such as WaMu, and "possessed" institutions such as Freddie and Fannie. WaMu was allowed to remain open long enough to "eat" the profitability of the living institutions in its markets via competition. Freddie and/or Fannie were once-healthy institutions that became "possessed" by politicians in order to pursue a social agenda. These are two distinct phenomena.

[23] In commercial real estate, where incentive and ownership structures are different from those of homeowners, the idea of "handing over the keys" of a property with negative equity is not a new idea.

[24] The author hopes that the irony of Freddie Mac asking consumers to weigh externalities is not lost here.

> "mortgage guarantors and investors, including Freddie Mac, would need to factor this risk more prominently into their credit policies and prices. The likely impact on future homebuyers: the cost of a mortgage will go up and credit terms will be less flexible. Thus, the impact of strategic defaulters on still more families might be more expensive mortgages and loans that are more difficult to obtain."[25]

After such a disruption, it is likely that consumers will need much higher credit scores to secure loans in the future. That, combined with larger down payments and lower debt ratios will be the likely solution. Anecdotal evidence suggests that this is already the case in 2010. So the effort to bring home ownership to "the masses" will likely result in a reduced net ownership rate among new households for the foreseeable future.

During the recent economic slump, we've seen evidence that employers are turning more often to more expensive screening or costly signaling systems when recruiting. New college graduates, in particular, are faced with obtaining additional certifications or other formal professional training, and more employers are resorting to "internships" for all recruits. More than ever before, the cost of distinguishing oneself from "the masses" of new degree holders is to be borne by the individual.

For Institutions

The recent Dodd-Frank financial reform bill reflects an attempt to limit the "Too Big to Fail" policy appliciations, although the bill also includes provisions giving future administrations seemingly unlimited bailout authority without any Congressional approval needed. It is likely that this provision will be interpreted as applying to any corporation needing government protection, in the same manner as the TARP was applied to General Motors.

The Federal Reserve has slowly phased out its liquidity programs over time, and institutional reliance on the alternative, the Federal Home Loan Banks, has returned to normal levels as well. It is interesting to note, though, that the Dodd-Frank bill requires a one-time GAO audit of the Federal Reserve and all of its lending programs back to 2008, to be delivered by December of 2010. Additionally, it requires regular transparency of any subsequent liquidity or policy-based Fed lending on a delayed basis, much as the results of monetary policy meetings are delayed now. Evidently, the principle of "market discipline" applies to the Fed as well as its subject banks, albeit on a lagged basis.[26]

It remains to be seen what will be done with Freddie and Fannie, but as of December 24, 2009 the US Treasury under Secretary Geithner has committed to funding them for as much and as long as is necessary. House banking committee chair Barney Frank has suggested that they need to be done away with. From a CNBC interview with Larry Kudlow, August 20, 2010, Congressman Frank said that

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[25] See Bisenius (2010). As of May 2010, Freddie Mac was still offering to refinance homes for up to 25% more than their current value. During the same summer, Congress was berating FHA for having lending caps that were too low.

[26] As alluded to above, the late Mark Pittman of Bloomberg.com was responsible for suing the Federal Reserve under the Freedom of Information Act in late 2008. The eventual ruling for disclosure in 2009 is likely what prompted the language in the recent bill.

> *"it was a great mistake to push lower-income people into housing they couldn't afford and couldn't really handle once they had it." He then added, "I had been too sanguine about Fannie and Freddie."*
>
> *When I asked Frank about a long-term phase-out plan that would shrink Fannie and Freddie portfolios and mortgage-purchase limits, and merge the agencies into the Federal Housing Administration (FHA) for a separate low-income program that would get government out of middle-income housing subsidies, he replied: "Larry, that, I think, is exactly what we should be doing."*[27]

Kudlow then goes on to note that Secretary Geithner has echoed this sentiment during recent meetings on the issue.[28]

How this will ultimately destabilize the housing and mortgage industries in the short term is unclear, but we know that Fannie and Freddie (and FHA) still maintain, even in receivership, a huge grip on the industry. Even several years later, private lenders are hesitant to make mortgages to borrowers with anything but excellent credit scores, and the private mortgage-backed security and CDO market has not recovered either. More than 90 percent of all home mortgages in the US still had some connection to F&F in late 2010.[29] We will have to wait for a resolution of the Freddie and Fannie problem before we can understand the impact on lenders and the housing markets in general.

[27] Kudlow (2010).
[28] Drawbaugh and Lawder (2010).
[29] Ibid.

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EVALUATING ALTERNATIVE CASH DELIVERY BUSINESS MODELS: THE CASE OF GUFS FINANCE IN INDIA

Christina Zhang, Shyam Kamath, Al Budris and Maria Ruess,
California State University, Monterey Bay

Paul Martin
Monterey County Convention and Visitors Bureau

THE MICROFINANCE INDUSTRY IN INDIA

Neeru Chawla, CEO of Commercial Credit and Investment Bank (CC&IB) in Mumbai, India was faced with a decision that would be decisive for the future success of the Microfinance Institution (MFI) lending arm of her bank in making loans to its underserved clients in key rural areas of India. In conjunction with Ajay Parmar, General Manager of the MFI subsidiary, she had to decide which business model for cash disbursements and collections she had to adopt at her MFI in order to improve the efficiency and profitability of operations to provide the funding for growth and to compete with other Indian MFIs.

CC&IB is a new and successful bank in India that grew as a result of the liberalization policies of the Indian Government in 1991 and the subsequent opening of the previously nationalized banking system in the country to private banking. The CC&IB Group created the CC&IB Foundation for Inclusive Growth to champion human development and economic growth while balancing environmental and social concerns. The primary focus of the CC&IB Foundation is to increase the incomes of low-income households sustainably by improving market access to low-income households. The principal focus is addressing market failures that constrain this accessibility. The aim is to make markets more responsive to the poor's needs and tap into the low-income households both as producers and consumers.

Neeru knows that she has a very successful partnership with Integrated Indian Financial Services Trust (IIFS Trust) in serving its rural clients, but the cash disbursement/collection system it has developed needs to be substantially revamped in order to serve its clients and grow profitably. CC&IB partners with CC&IB Foundation as a for-profit organization established to improve the accessibility of financial services to individuals and enterprises in underserved rural markets. Its mission is to "ensure that every individual and enterprise in rural India has complete access to financial services. “The philosophy is that rural markets represent a significant market opportunity that can generate returns that would meet the expectations of commercial investors. The IIFS Trust's strategy for achieving its mission entails:

- High-quality and sustainable channels for origination (credit) and distribution (non- credit financial services) that reach out to under-served locations of rural India.
- Well-functioning rural supply chains.
- Funding structures that use capital judiciously.

- An aggressive learning environment that informs regulation and innovation.

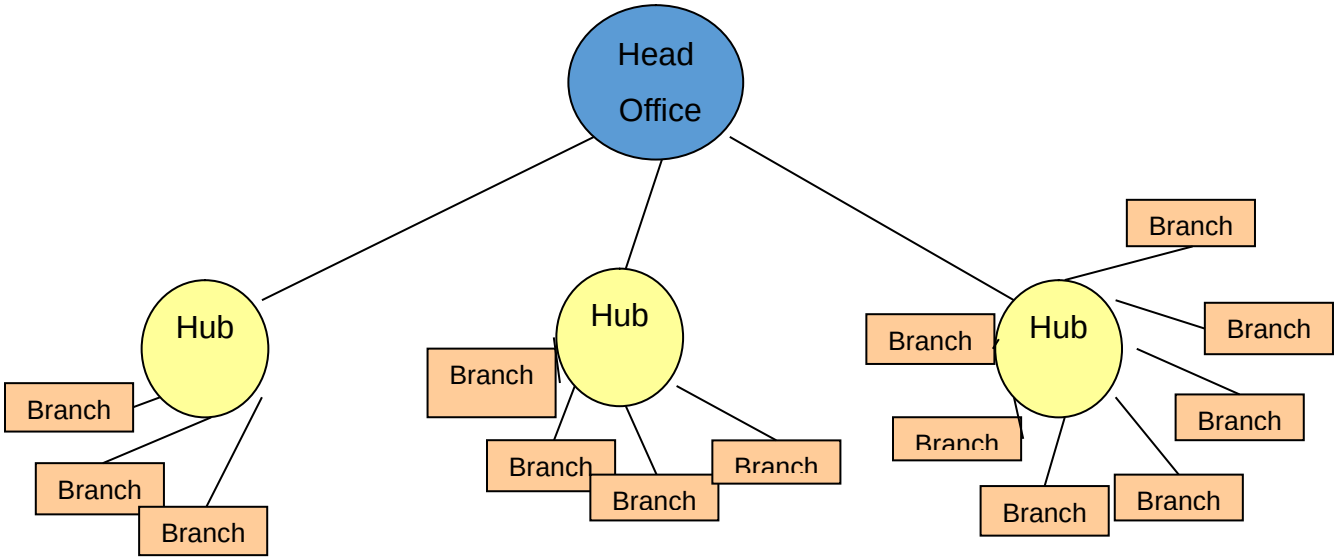
IIFS's parent, IIFS Trust Holding Company (ITHC), has created a network of Grameen Udyog Financial Services (GUFS) companies to meet the vast, unmet demand for financial services in rural, under-served parts of India. Each GUFS covers a population of around five million in roughly two districts and has "thin" branches at the village level (each branch is expected to have a staff of two people, designated as wealth managers) with a robust regional hub offering automated back-end services. Each GUFS branch offers 11-12 products, including multiple credit products, savings products, insurance, remittance products, and investment products such as money market mutual funds (which may also be used as savings vehicles). Most of the non-credit products are distributed on behalf of a well-diversified, well-capitalized national entity. The first GUFS branch was opened in July 2014, and 14 new branches were set up by October 2014. By the end of 2015, each branch had 30% of the local population as its customers for some type of service or product offered. ITHC operated four GUFS companies in different parts of the country by the end of 2015.

Neeru and Ajay were aware that the Indian microfinance industry was the largest and one of the most competitive MFI markets globally. The provision of financial services to the economically disadvantaged through non-traditional commercial banking forms has evolved in India over the past 50 years.

CASH MANAGEMENT AT GUFS

GUFS is a subsidiary of IIFS Trust Holding Company and serves to meet the large demand for financial services in rural India. GUFS utilizes the infrastructure and technologies provided by ITHC, and wants to be the leader in its market, planning to capture most of the demand in the villages it serves. Ajay Parmar, its General Manager, knows that to serve its clients well and make its operations profitable enough to grow financially, it needs to improve the structure and efficiency of its cash management system. He, along with Neeru, recognizes that the hub and spoke structure of the MFI (Figure 2.1) is very well tuned to serving its clients in the far-flung villages in its ambit of operations in rural India. However, the efficiency and profitability of these operations need to be improved.

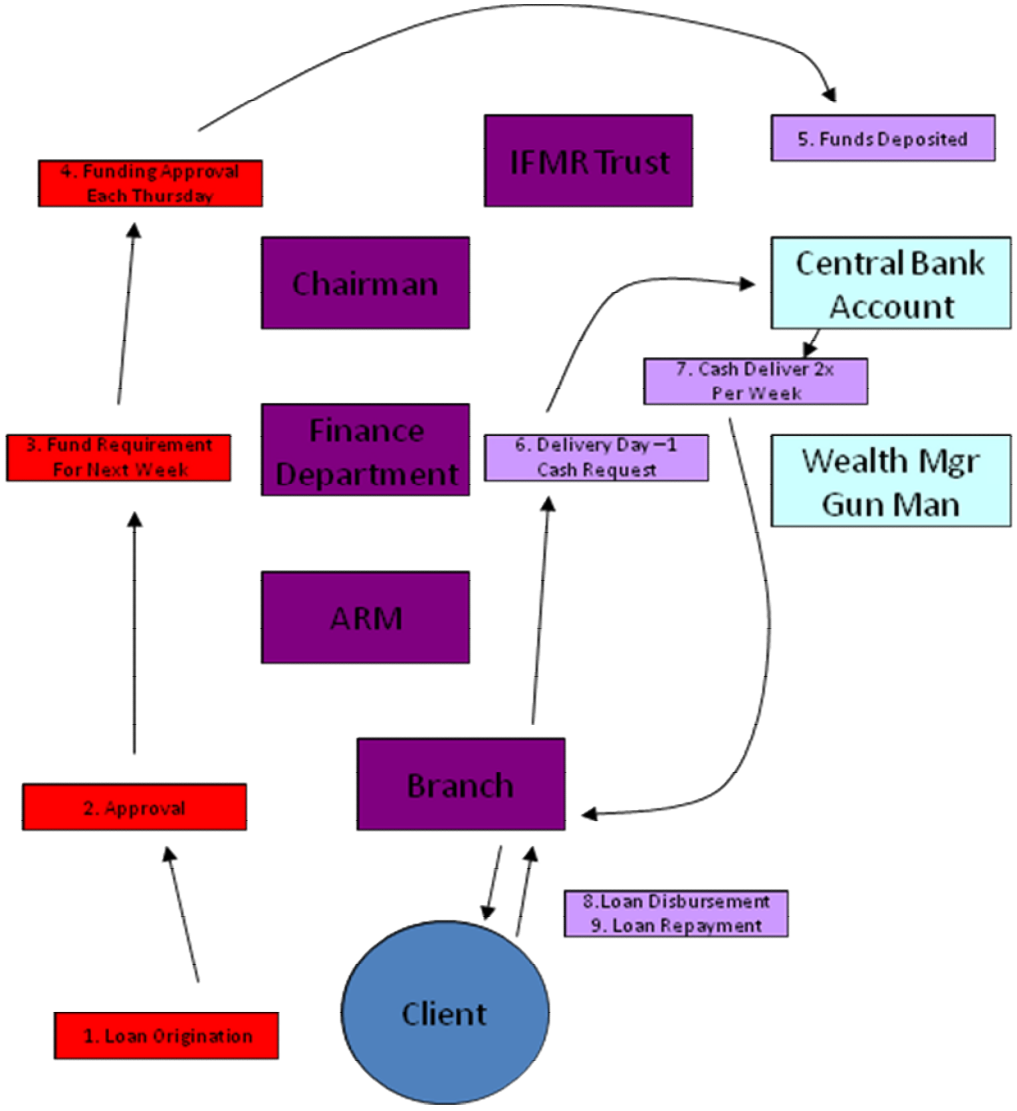
Figure 2.1 Hub and Spoke Structure of GUFS



The company's structure consists of the head office, where Ajay and his staff make all the strategic decisions and disseminate to the hubs, which operate as hubs for branches in one geographical district. Currently, GUFS has three hubs. Each hub currently manages anywhere from three to seven branches. The goal is to have eighteen hubs with 20 branches each. Assuming every branch serves ten thousand people, GUFS wants to serve as many as three million to three and a half million people. It requires that the cash disbursement and collection system be efficient to increase the overall efficiency and profitability of the operations.

The cash disbursement and Loan repayment system at GUFS is shown in Figure 2.2, starting from loan origination at a storefront and through delivering the cash into the storefront and disbursement. All loans at GUFS are originated at storefronts. Customers fill out an application with the loan officer, who then sends it for approval to the manager. If the application satisfies all the underwriting criteria, the loan is scheduled for funding in the finance department. The finance department approves loan funding every Thursday and deposits the funds to IIFS Trust's account at the central bank, the Reserve Bank of India (RBI).

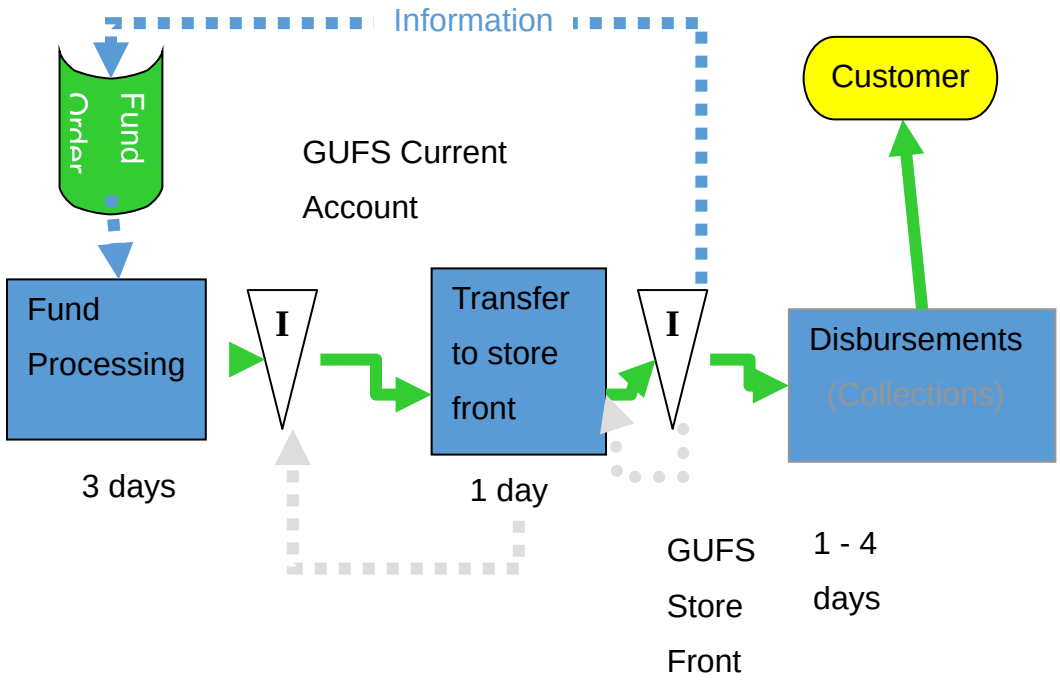
Figure 2.2 Cash Disbursements and Loan Repayment Cycles of GUFS



Branches receive cash from GUFS's current account twice per week, delivered to them by a secured vehicle with a gunman inside. The cost for using such a method as often as GUFS does is high, but due to the lack of infrastructure and appropriate legislation, they have very little choice. Ajay is focusing on the processes shown in Figure 2.2 that are colored in purple, since those processes affect the cash efficiency of the MFI in a significant way and hence its profitability.

Figure 2.3 displays the cash disbursement/collection system in GUFS in more detail. IIFS Trust transfers the money from their account to GUFS' current account in central bank. Funds are held idle for three calendar days in the current account, and it takes one business day for cash to be transported to the storefront for actual disbursement to customers. For Ajay, his goal is to recommend to Neeru, a business model that would optimize cash usage by providing alternatives for current processes at GUFS while following the client's vision and mission statement.

Figure 2.3 Cash Disbursement/Collection System at GUFS



Neeru had commissioned a study to analyze the major business models in the Indian MFI industry, and CC&IB received the study in early 2015. The major business models for the cash disbursement and loan system were variegated and structurally distinct, so their fit with GUFS's existing practices and operational and organization structure was an essential element in choosing the appropriate system. She asked Ajay to examine the fit and the financial advantages for GUFS of adopting them. The alternative business models are described below.

OVERVIEW OF MAJOR BUSINESS MODELS IN THE MICROFINANCE INDUSTRY

3.1 Stored Value Card Business Model

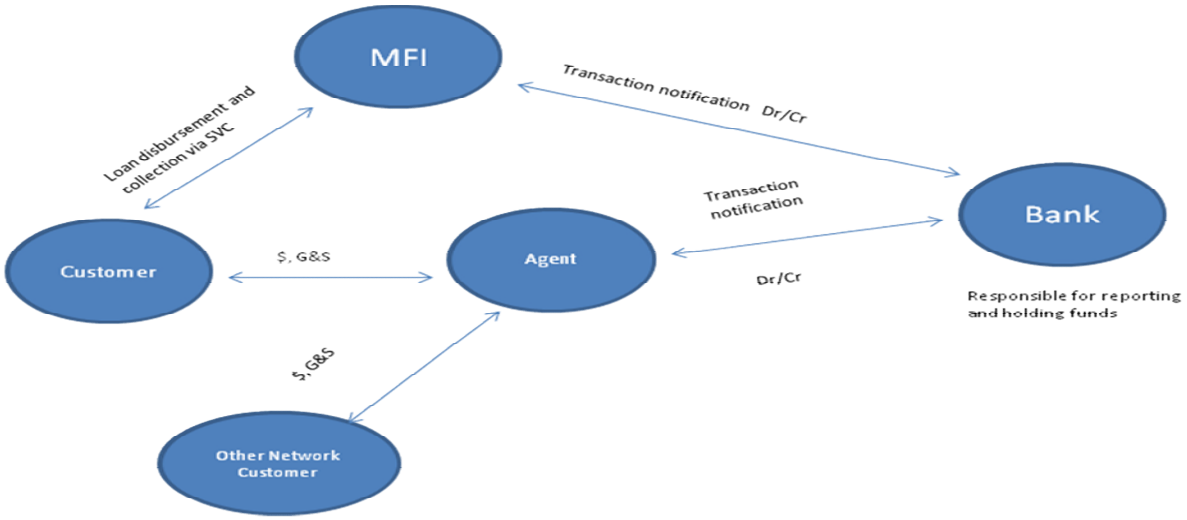
A Stored Value Card (SVC) refers to monetary value on a card, not in an externally recorded account and differs from prepaid cards where money is on deposit with the issuer, similar to a debit card. The major difference between stored-value cards and prepaid debit cards is that prepaid debit cards are usually issued in the name of individual holders, while stored value cards can be anonymous. The term stored-value card means the funds and or data are physically stored on the card. With prepaid cards, the data is maintained on computers affiliated with the card issuer. The value associated with the card can be accessed using a magnetic stripe embedded in the card, on which the card number is encoded; using radio-frequency identification (RFID); or by entering a code number, printed on the card, into a telephone or other numeric keypad.

Some alternative sub-options were within the Stored Value Card (SVC) business model option. These are described below.

- Bank-Led SVC Model

In bank-led SVC business model (Figure 3.1), customers transact business via POS device at participating retail agent. The bank credits and debits the accounts of the customer, and after the transaction, the agent does the reposting and holds the funds.

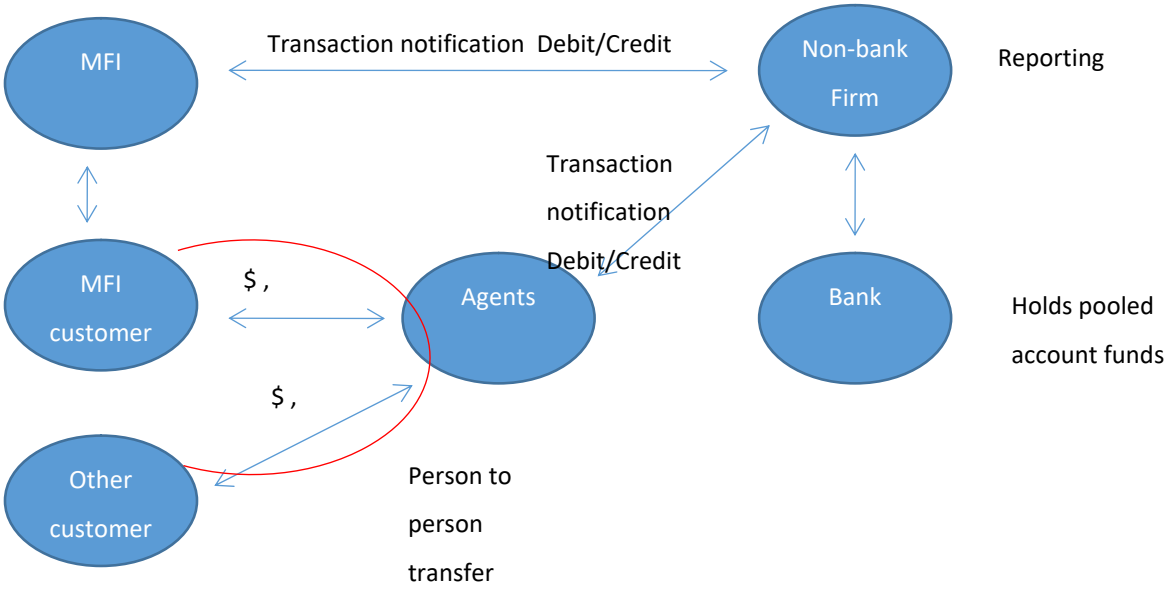
Figure 3.1 Bank-Led SVC Model



- Non-Bank Led SVC Business Model

This model is similar to the bank-led model. However, instead of the bank reporting and issuing the cards, the non-bank firm does it, as shown in Figure 3.2 below.

Figure 3.2 Non-Bank led SVC Business Model



The card can be credited from regular bank accounts at specially equipped terminals, and the value is stored on the card itself without the necessity to go online, which makes it much faster and enables offline payments possible. However, customers failed to appreciate substantial advantages over paying in cash and remained concerned about the security and reliability of the new system.

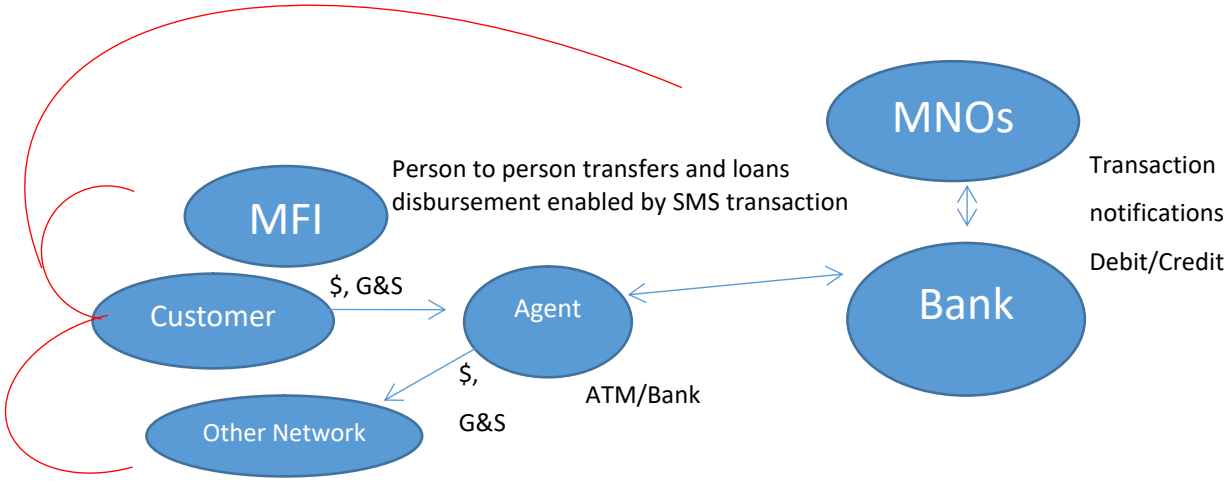
3.2 Mobile Electronic Money Business Model

The ability to use mobile phones for financial service delivery is the basis of the Mobile Electronic Money Business Models (MEMBM). Electronic money or e-money is also called the electronic alternative to cash. In this model, consumers can transfer the monetary value stored on their account (device, card, server, etc.) to other customers and businesses within the network. Another key component of the MEMBM is the agent network, which allows the networks' customers to implement cash-in and cash-out transactions and exchange goods and services for e-money. Again, there are variants of MEMBM.

- Bank-Led Mobile Electronic Money Business Model

In this business model, transactions are made via mobile phones. The bank holds funds and credits and debits accounts of the parties involved in the transactions. Figure 3.3 shows the interconnection of customers with agents, banks, and MFIs. The Mobile Network Operators (MNOs) are just the infrastructure provider for POS devices, which are mobile phones in this model. Mobile phones allow the customers of the network to pay specific bills, transfer money and make person–to–person transfers.

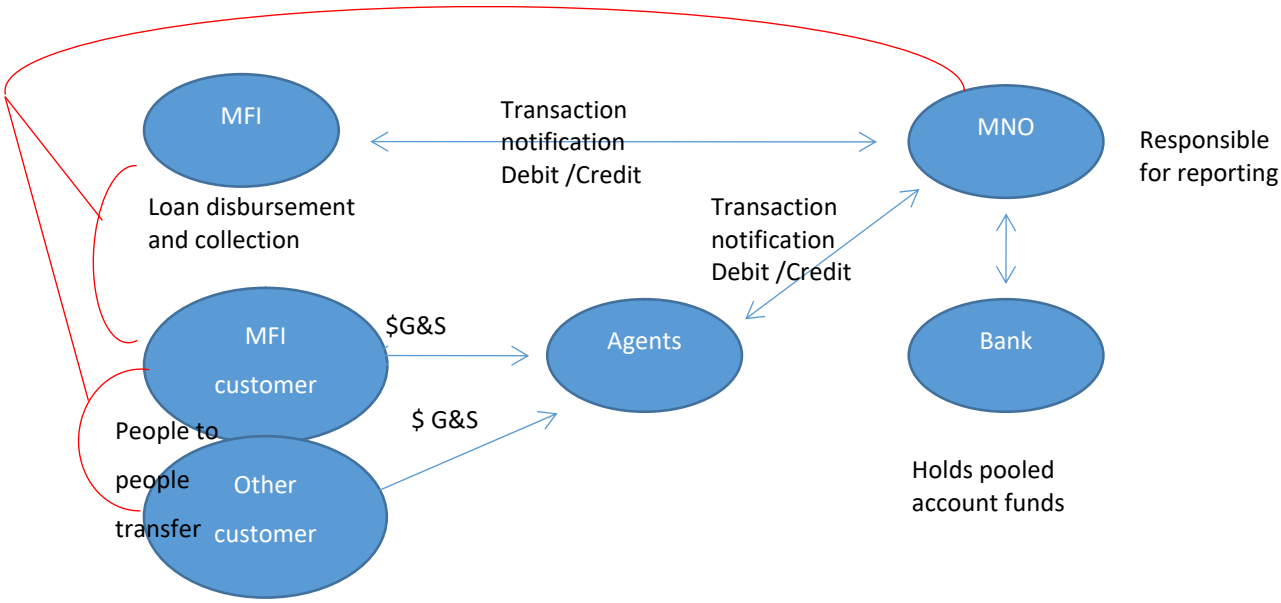
Figure 3.3 Bank Led Mobile Electronic Money Business Model



- Non-Bank-Led Mobile Electronic Money Business Model

In this business model, the transactions are done via mobile phones, where the bank holds funds, but the Mobile Network Operator credits and debits accounts of the parties involved in the transactions. Figure 3.6 shows the interconnection of customers with agents, MNOs, and the MFI, where banks are just holders of the funds.

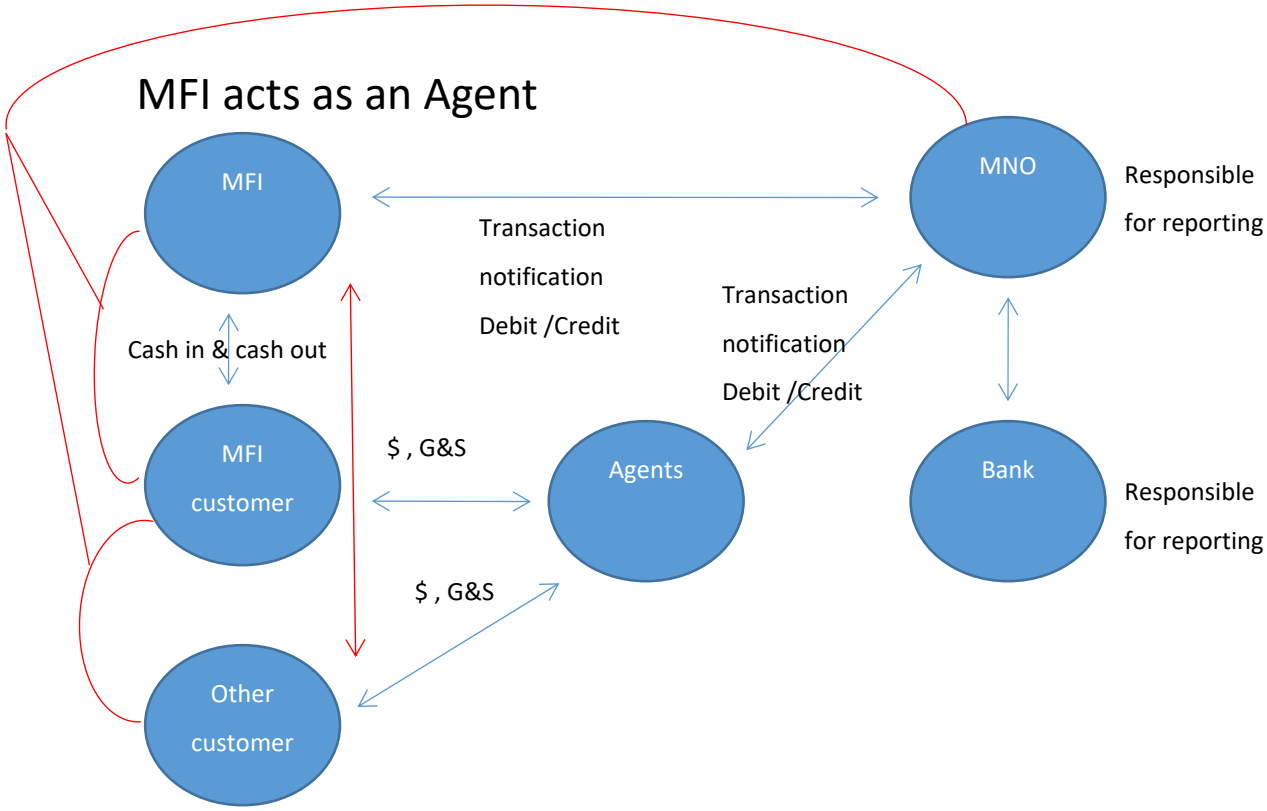
Figure 3.6 Non-Bank Led Mobile Electronic Money Business Model



3.3 Cash Netting Business Model

The Cash Netting Business Model allows MFIs to leverage their cash management efforts by acting as an agent of the network providing cash in and cash out transaction capabilities to the village population. Subscribers can opt-out or use the MFI or another agent to deposit cash into their electronic money account and take cash out. The MFI generates additional fee income for acting as an agent and increases its presence in the community by providing this additional service. Figure 3.9 shows the major elements and features of the Cash Netting Business Model. The key feature in the figure is that there is no need for an agent in this model since the MFI itself acts as the agent and nets the fees in this role.

Figure 3.9 Cash Netting Business Model



3.4 Money Transfer Business Model

In this model, an established public (or private) intermediary like the post office or the postal service acts as the principal money transfer organization for the MFI due to its widespread network and penetration in rural areas and collects the transfer fees to facilitate transactions. Rural clients use the post office to collect and disburse transactions to the MFI and each other.

SELECTION OF CASH DISBURSEMENT/COLLECTION BUSINESS MODEL

Neeru and Ajay understood that selecting the cash disbursement/collection model that would best fit GUFS's far-flung rural operations would depend upon the strategic criteria and financial performance of the identified business models. Based on the findings of the CC&IB study, they developed a set of criteria predicated on India's MF regulatory environment and the characteristics of the MFI industry and GUFS' needs.

Accessibility of financial services to the low-income citizens in rural areas provides enormous potential to support the economic activities of the poor and contribute to poverty alleviation. It emphasizes the sound development of microfinance institutions as vital ingredients for investment, employment, and economic growth. The Government of India and RBI have a strong interest in improving access to financial services for the unbanked poor population of rural India. Three main areas of concern - access to finance, consumer protection, and banking sector stability have shaped RBI thinking on branchless banking.

The business models discussed previously contain basic elements of branchless banking, which offers the potential to manage cash more efficiently and penetrate more customers through more effective distribution. The models are successful in many different countries and prove to lower the costs of delivery, mitigate security concerns, and improve the speed of transactions and convenience by providing remote access to services.

Both Neeru and Ajay knew that each model's financial return and actual financial potential needed to be the prime consideration of the final business model because of the highly competitive nature of the Indian MFI market. Hence, they developed a methodology for calculating the cost of capital in the Indian microfinance environment and the financial assessment of the total overall return of using each model to meet GUFs' needs. The next section develops the methodology for such an evaluation and provides the data for such an assessment.

FINANCIAL EVALUATION OF ALTERNATIVE BUSINESS MODELS

Before Neeru and Ajay can proceed with the project valuation, it is crucial to determine the cost of capital that is appropriate for the proposed project.

5.1 Cost of Capital, WACC

The cost of capital (also known as the discount rate) is often correlated with the project's riskiness. As the risk of the project increases, the cost of capital should increase accordingly. GUFS uses the Weighted Average Cost of Capital (WACC) for the whole financial institution and investments of similar risk. The microfinance project is believed to have a similar risk to the firm, so WACC should be used in the valuation.

$$WACC = (1 - t) * r_D * \frac{D}{V} + r_E * \frac{E}{V}$$ **Equation 1**

where D and E are the market values of the debt and equity, respectively, r_D is the pre-tax cost of debt, r_E is the after-tax cost of equity, V is the value of the firm (V = D+E), and t is the corporate tax rate.

To successfully determine WACC, GUFS requires three inputs: capital structure, cost of debt, and cost of equity based on the current capital structure. The capital structure is how a firm finances its overall operations and growth by using various sources of capital. In general, capital can be divided into three categories: debt, preferred stock, and common equity. Debt can be broken down further into public bonds and private bank loans, while common equity can be divided into retained earnings and new common stock offerings.

A firm's capital structure can be a mixture of the capital stated above. When determining the capital structure, the key is to figure out the debt-to-equity (D/E) ratio, which provides insight into how risky a company is. Debt is one of the two main ways companies can raise capital for their investment projects. Firms prefer debt because of the tax shield benefits. Interest payments are tax-deductible, and debt is supposed to be safer than equity, so the after-tax cost of debt is generally much lower than the after-tax cost of equity. In addition, unlike equity which dilutes ownership, debt allows a company to retain the ownership, so the firm's founder can remain in control of the business. Equity, on the contrary, represents a claim on the company's future earnings as a part-owner. However, as the proportion of debt increases, the riskier the firm

becomes because higher debt leads to a higher probability of bankruptcy. Therefore, there is an optimum debt level that a firm should maintain. When a firm reaches its optimum capital structure, it can maximize the tax benefits and minimize the bankruptcy costs associated with the debt.

To find the value of both debt and equity, one needs to look at the balance sheet. Based on the consolidated balance sheet of GUFS, the average debt to capital ratio is 88%, so the weight of equity is 12%. In addition, we are given the following information from GUFS:

- Tax rate = 30%
- Cost of funds for onward lending = 8%
- Interest rate on operational expenditure funding = 12%
- Percentage of onward lending = 93%
- Cost of equity = 25%

5.2 Capital Budgeting and the Calculation of Financial Return

Firms face various investment opportunities every day. One of the key responsibilities of the management is to determine which project(s) to take to maximize firm value, which in turn increases shareholders' wealth. There are various ways a manager can use to select projects.

NPV method: Net Present Value (NPV) method (also known as the discounted cash flow method) is a popular capital budgeting technique that considers the time value of money. It is the difference between the present value of the project's incremental cash outflows and inflows. A project should be taken if and only if its NPV is positive because a negative NPV project decreases the firm value. NPV tells us how much a project contributes to shareholder wealth – the larger the NPV, the more value the project adds; and added value means a higher stock price. Thus, NPV is the best selection criterion.

IRR method: Internal Rate of Return (IRR) method is a capital budgeting method that measures the profitability of the potential investment. It is a discount rate that makes the NPV of a project equal to zero. The higher a project's internal rate of return, the more desirable it is to undertake the project. It is often compared to the cost of capital to determine if the project provides the minimum return required by the investors. IRR is a direct measure of the project's rate of return. If this return exceeds the cost of the funds used to finance the project, the difference will be an additional return that goes to the firm's stockholders and causes the stock price to rise. On the other hand, if the IRR is less than the cost of capital, stockholders must come up with the differences, so stock price will fall. Although the IRR is logically appealing, it sometimes may lead to the wrong decisions

Payback period method: The payback period is the length of time it takes to recover the original cost of an investment. The longer the payback period, the less desirable it is to undertake the investment. Unlike the previous two methods, the payback period method ignores the time value of money. It generally works better among small-scale and short-term investments because these projects are less likely to be influenced by the discount rate. However, those relying heavily on the Payback period method often find themselves in a position that multiple projects have identical Payback periods, making it hard to choose the right one when they are mutually exclusive.

Although all three methods are commonly used in practice, and managers sometimes use a combination of the methods to be more confident on the outcome, at GUFS, the NPV method is typically used for capital budgeting problems. This time is no different. The manager decides to calculate the net present value of the microfinance project before making the final decision. If it turns out the project adds no value to the firm or decreases the current firm value, they will not proceed despite how attractive the business plan may sound.

$$NPV = -Initial\ Investment + \sum_{i=1}^{t} \frac{CF_i}{(1+WACC)^i}$$ **Equation 2**

where Initial Investment is the original cost of the project, CF_i is the cash flow provided by the project in year i, and WACC is the cost of capital of the firm.

A key ingredient in the NPV formula is the cash flow associated with the project. The cash flow projections for a sample MFI loan can be found in the Appendices. The loan has a maturity of 1 year, and it calls for a weekly payment. However, it is important to note that as GUFS grows, it will become more efficient at processing these microloans, so the economy of scale can be achieved. As a result, the loan data can be different depending on the estimation period. In order to capture this growth prospect, both current period estimation and projected scale estimation data are presented in the Appendices.

5.3 Financial Analysis of Alternative Business Models

Aside from the feasibility of the business plan, the manager is also interested in finding out if there are alternative business models for cash delivery, which is a key component in the cash management system in MFI. Under the traditional cash delivery method, GUFS is not as efficient and competitive as its competitor firms, BISWA and CASHPOR. In particular, GUFS information technology (IT) infrastructure enables what is essentially a very manual cash movement process that is not as efficient as the alternatives because of its inability to rely on IT infrastructure to predict cash needs in the branch fairly precisely and get real-time tracking and feedback of the cash disbursement and collection process. With the alternatives models, GUFS is hoping to reduce the cost of cash delivery, which makes it more affordable for the general public in India, so more people can take advantage of microfinance loans. The financial information of the four models that are illustrated earlier are listed below:

- Non-bank-Led stored value card with modeling based on OCL's Octopus card
  - Each branch is assumed to need one POS device to loan the loan disbursement onto the stored value card, and the cost of the POS device is around $384 or INR18,812.
  - MFI would have to pay the 1% retail fee on each loan disbursement and that the MFI would not act as a cash in or cash out agent but only use the POS device and network as a loan disbursement and collection facility. Therefore, they would have to pay 1% of the average loan amount as a one-time fee on disbursement or load to the borrower's stored value card.
  - Take-up rate starts at 25% and reaches 75%.
  - 40% reduction of human resources costs

  - Complete elimination of the cost of idle cash

- Non-bank-Led mobile payment solution with modeling based on Vodafone's M-PESA product
  - INR19 to send money within the network from one member to another. The fee would be incurred upon the loan disbursement by the MFI when they send money to the borrower and when the borrower makes repayment by sending money to the MFI.
  - Each branch needs a cell phone for making the transfer funding the loan to the borrower's account at a cost of INR4,891
  - Take-up rate starts at 10% and reaches 25%.
  - 40% reduction of human resources costs
  - Complete elimination of the cost of idle cash

- Cash-netting with the MFI as an agent in a non-bank led mobile payment solution again based on Vodafone's M-PESA product
  - MFI receives the two registration fees for each of their clients and they receive the cash out fee at disbursement of each loan.
  - 50% reduction in the idle cash costs.

- Money transfer and payment agent with modeling based on iMO form the India Post
  - 25% uptake in the first year and growing to 75% by the 5th year
  - 40% reduction of human resources costs.
  - Complete elimination of the cost of idle cash

Neeru and Ajay need help to decide which (if any) of the alternative models should be adopted by GUFS. If so, why?

DREAM EXPANSION: CAPITAL INVESTMENT DECISION IN ACTION

Afua A.B. Agyekum & Phyllis Y. Keys
Morgan State University

In Ghana, it is very common that entrepreneurs expand through diversification of services and products. Financing these operations, however, can be a challenge as inflation rates in Ghana (in comparison to those in developed countries) are considered high. This leads to high costs of financing and makes traditional lending practices nearly impossible. Some small businesses may start with funds from family members and very close friends; therefore, it is not uncommon for the key entrepreneur to set up additional facilities where services or products of a different nature are managed by immediate family members, very close friends, or other relatives. The entrepreneur in this case had been considering how to grow his current business and faced several alternatives for expansion as well as financing.

INTRODUCTION

Although he had not yet recovered the initial investment in his entrepreneurial venture, Livingstone knew that this was his season for expansion. After four years as principal owner of GEK Medical Laboratories, he felt that he had established a good routine for the company and was ready to step out in ways that could increase cash flows and improve profitability. As he was preparing for bed, he said, "Priscilla, tomorrow we must discuss which of the expansion plans will be best for our family. Now that Isaac has turned a year old, I would like to start preparing for his school fees. I must think of how to grow the business."

His wife, Priscilla, smiled. For as long as she could remember, the two of them had been friends. They had met in their native village of Winneba as children, and she had initially feared that his years away at university would make her forgettable. Thankfully, his memory, like his work ethic, was very good. "That will be a great conversation to have while enjoying our koko and kose." She was confident that her husband had already been thinking about the situation, yet she was pleased that he always included her in even the toughest of decisions.

As Livingstone turned out the lights, he wondered if he would be able to explain the financing options, the concerns that went beyond the calculations, and the opportunities and challenges that they might face as a result of the choice he would make over the next few days. Should he expand the offerings of medical services? Consider the idea of reviving his sales of detergents and soaps? Or engage with his relatives in an unrelated business for which he had little experience? He started to count off the pros and cons in his mind as he drifted to sleep.

BACKGROUND

While working on his Bachelor's degree in Medical Laboratory Science from the University of Ghana, Livingstone sold detergents, air fresheners, and other chemical products to hotels and business customers. He had enjoyed setting his own hours, traveling the countryside, and chatting with all the people he met in this line of work. He encountered challenges as suppliers were often delayed and his own travel was impeded by the quality of roads. The biggest challenge, however, was the presence of 'middle men' who eroded a lot of the anticipated profit.

As soon as he finished his degree, he had to complete the required National Service duty. Given his undergraduate training, he had served his duty at a teaching hospital in Accra, the capital city. That is when he first started dreaming of owning his own medical laboratory. Hearing about the entrepreneurship program at the Ghana Institute of Management and Public Administration, he enrolled for a second Bachelor's degree in Entrepreneurship. He eventually received an internship at the Korle Bu Teaching Hospital and had worked there as a laboratory technician for several years before starting his own laboratory. Over this same time period, Priscilla had come from Winneba to Accra to complete her nursing degree.

Livingstone combined the knowledge gained in his entrepreneurship studies with his prior selling experiences to open GEK Medical Laboratories (hereafter, GEK) where he sold medical equipment to hospitals and clinics. He knew it was not technically a lab, but he dreamed that one day it would become one. Four years ago, that dream became a reality when Livingstone heard about the closing of the laboratory services at Maraba Healthcare, a local family planning and reproductive health care facility. He was able to secure a contract with Maraba Healthcare that allowed him to operate his laboratory on the premises with rent, utilities, and janitorial services included for a percentage of the earnings on all his laboratory and scan services. Referring patients to GEK for needed laboratory services would, thus, be beneficial to both GEK and Maraba Healthcare.

The company started with only laboratory services, and Priscilla worked some hours assisting Livingstone while maintaining night hours at a local hospital. Within less than a year of working with patients from Maraba Healthcare, Livingstone decided that scan services would lead to increased revenues. With those services, he had found it necessary to hire two radiology technicians. Now in total, GEK had five employees: the two radiology technicians, an administrative assistant, a lab technician, and Livingstone who served as a lab technician when he was not out securing contracts or negotiating with suppliers. Priscilla had resigned from her nursing position, as well as discontinuing her work at GEK, when Isaac was born.

Over the years there were some situations that required renegotiation of contracts with Maraba, some lessons learned when contracting with organizations for special services, and some strong negotiations with suppliers. All in all, GEK was turning out to be a profitable venture and Livingstone was gaining a well-established reputation for both his medical and interpersonal skills. His genuine concern for the welfare of others helped gain additional referrals which allowed GEK to get contracts with national agencies and local educational facilities.

EXPANSION PLANS

After their breakfast of koko and kose, Priscilla put Isaac in his crib and rejoined Livingstone at the kitchen table. He poured her a cup of tea and started describing GEK's options. "At the moment, we are still on the path to recovering the initial investment in GEK. Nonetheless, I have been thinking about expanding the operations of the company into other environs where health services are lacking or not in existent at all so that we can take advantage of the market. If we had just continued with lab services, it would have been very difficult. However, with the scan services, business has picked up. So I am thinking that additional health care services might be a good idea."

"Didn't you say not too long ago," Priscilla offered, "that your old selling business could boost revenues? Now that you have strong business connections, you are likely to find better suppliers than you had when you were a student. Selling detergents and other chemical products might be worth considering."

"Yes! I ran into Ebenezer last week. You remember my old schoolmate who completed his studies in Chemistry. He has offered some investment for a percentage of the business if I would consider the production of detergents for selling. He has been working for a chemical supply company for several years and has set aside a nice sum of money." Livingstone was excited about the prospects of working with an old friend in a business where he had experience, but concerned about it also. He wanted to be reasonable in his terms with his old schoolmate, but he also had to protect his own family's interests.

"And, what about Abena? Your father's niece?" Priscilla reminded Livingstone that his cousin wanted him to consider expanding with a restaurant where she would cook grilled chicken and prepare organic fresh fruit juice for customers. Abena was an excellent cook, and there was no other place to get good food near GEK's facility. They could sell food to the health care customers. Abena's family would be willing to contribute toward Livingstone's business for a small return, if he gave her this position.

Livingstone was a little more comfortable with his family's offer in comparison to that of his schoolmate. Most of the people he knew who had diversified businesses had been able to do so by having family members contribute for a modest return on their investment and sometimes an employment contract for another relative. There was rarely any talk of ownership interest. Still, he wanted to give all options some thought before making a final decision.

At that time, Priscilla heard Isaac moving about so she recommended that Livingstone create some spreadsheets to show what cash flows he might expect from the three options they were facing. She would spend some time playing with Isaac. When he finished with the spreadsheets, she could review them while he had quality time with his son. They could finish their discussion during Isaac's afternoon nap.

Livingstone went to the spare bedroom where he had recently put a desk and chair, primarily for Priscilla who was using her time at home to plan for an advanced degree to teach at the nursing college. He expected this would take several years as she was waiting until she was ready to leave Isaac with others. He would have to think about the costs of her advanced degree later. For now, he needed to think about the revenues and expenses each of the business options would generate.

FINANCING OPTIONS

When Livingstone finished all three forecasts of yearly cash flows, he moved his work back to the kitchen table where Priscilla was giving Isaac his mid-day meal. Livingstone knew he would need a discount rate to determine the net present value of the cash flows. Identifying a proper rate was related to the main challenge for his expansion – the challenge of a financial constraint. The government policy rate in the country was about 26 percent. He bemoaned the difficulty of securing a loan and the high cost of capital in the country. "In Ghana, access to capital is limited and it is expensive. To borrow for a business like mine is very, very expensive. Average interest rates as of now, are around 38 to 45 percent per annum for this line of business. Once you tell them about a medical lab, they see it as a risky business and the interest rate just shoots up."

One advantage of detergent production would be avoiding this high cost of borrowing. Ebenezer's contribution would be an ownership investment. Also, to Livingstone's credit, he had always been good at maintaining contacts. Furthermore, he expected that he had expanded his circles enough to include others if he chose this line of business. An added cost, however, would be the need to invest in a delivery vehicle for supplying to all the customers and businesses.

Livingstone was pretty sure that the negotiated return for his uncle would be much less than that for a bank loan, probably even as low as one-third of what the bank would require. Another advantage of borrowing from family members would be that they would not require any collateral. Of course, he would have to add a salary for Abena and maybe one other relative to help her with the restaurant. It was a matter of trust that Livingstone would repay his relatives. Eventually, his cousin might even be able to open a restaurant of her own in another part of the city after her experience with GEK. In such a situation, he might have a chance to earn his own return if he found himself in a position to fund another restaurant.

In evaluating the three projects to determine which choice to make in the face of scarce resources, Livingstone shared his opinions with Priscilla, "One factor will be identifying which option will be the fastest in terms of recouping our investment. I believe a fast return will allow us to invest in the other areas if they remain attractive at that time. Another issue, however, is that the social factor keeps me aware of the need in this community. Quality, affordable health care is a must. I want to achieve this goal in more areas than just lab work and scan services. I remember how I almost lost my own mother due to shabby lab work. If I had not intervened, Isaac would not have a grandmother today. Will it be wrong to delay expanded medical services just because the financial outcome is less attractive?"

Priscilla handed Isaac over to his father and said, "Play with your daddy while I review his numbers." She said to Livingstone, "He will be asleep in about 30 minutes. You can place him in the crib then, and we will decide what to do."

Exhibit 1. Cash Flows for Investments

	Project 1 Laboratory Scan Services	Project 2 Chemical Products	Project 3 Restaurant
Initial investment	$ 25,000.00	$ 20,000.00	$ 22,000.00
Monthly operational costs			
Rent	125.00	125.00	375.00
Utilities	75.00	50.00	250.00
Salaries	1,000.00	750.00	750.00
Consumables	1,000.00	1,250.00	2,500.00
Estimated annual revenues			
Year 1	30,000.00	30,000.00	3,000.00
Year 2	30,000.00	45,000.00	12,000.00
Year 3	45,000.00	48,000.00	15,000.00
Year 4	45,000.00	48,000.00	15,000.00
Year 5	60,000.00	48,000.00	30,000.00

Exhibit 2. Equipment Cost and Economic Life

Item	Project 1	Project 2	Project 3	Depreciation rate	Economic life
Computer and printer	$540.00	$540.00	$540.00	33%	3 years
Chemical processing machine		10,000.00		20%	5 years
Furniture and fittings	1,260.00	460.00	5,000.00	20%	5 years
Laboratory equipment	14,200.00			20%	5 years
Restaurant equipment			16,460.00	20%	5 years
Scan equipment	9,000.00			20%	5 years
Vehicle		9,000.00		20%	5 years

All amounts have been translated at a rate of GHS4.00: $1.00 and are quoted in US dollars.
Assumptions: Corporate tax rate = 25 percent, Estimated inflation = 18 percent