THE OPPORTUNITY COST OF CARRY: AN ANALYSIS

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B.S., California State University, Sacramento, 2001

PROJECT

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THE OPPORTUNITY COST OF CARRY: AN ANALYSIS

A Project

by

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Approved by:

Hugh Florsich, PhD

Committee Chair

8-12-09

Date

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Student: Lacie Mackenzie Woodward

I certify that this student has met the requirements for format contained in the University format manual, and that this Project is suitable for shelving in the Library and credit is to be awarded for the Project.

Monica Lam, Ph.D.
Associate Dean for Graduate and External Programs

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Date 8-3-2009
Abstract

of

THE OPPORTUNITY COST OF CARRY: AN ANALYSIS

by

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Statement of Problem

It has often been said that “Cash is the lifeblood of any organization.” This statement is especially true for the Construction industry when subcontractor payments often do not follow general trade payable schedules. Because of this, more cash on hand is necessary for successfully performing the contracted work. A. Teichert & Son is a very conservative, cash rich company. It has come up with a system to reward a healthy and positive cash flow and aggressive collection and billing efforts by Construction and Materials. When inventory and retention are held and the accounts receivable balance ages, money and other resources are tied up. A company with limited cash reserves would have to borrow money to cover expenses. Companies that are cash healthy may instead choose to assess a “charge” to revenue producing business units. This charge is calculated at the administrative or corporate (non-revenue producing) level and is allocated to revenue producing business units or companies based on their changes in A/R, changes in inventory, changes in retention, and change in work in progress. This charge is meant to encourage revenue producing business units to collect aging accounts receivable, bill clients aggressively, reduce inventory, and release retention on jobs (when
appropriate). Problems with this carry charge include quantifying the opportunity cost (or the return on investment that could be achieved had the cash been available), making this charge relevant to a service organization (such as a construction division) as well as a manufacturing division where inventory is more easily quantified, and gaining employee buy-in for a “pretend” charge that ends up being eliminated at year end.

Sources of Data

Sources of data used in this analysis include Construction trade journals, academic journals, newspapers, magazines, internet sources, and several interviews conducted with employees working in the Construction and Materials Manufacturing industries.

Conclusions Reached

While one size does not fit all when calculating a cost of carry, the basic factors that should be considered if doing so are the opportunity cost or the cost of capital, the company’s overall cash position, extra work that is required in calculating this charge, and the challenge of rolling out a new process to an organization.

Committee Chair
Hugh Fursich, PhD.

Date
8-12-09
ACKNOWLEDGMENTS

"The person who tries to live alone will not succeed as a human being. His heart withers if it does not answer another heart. His mind shrinks away if he hears only the echoes of his own thoughts and finds no other inspiration." - Pearl S. Buck, American Author

First, I would like to thank my project advisors Dr. Hugh Pforsich and Dr. Charles Davis. Without their help and ideas, this project would not be possible.

To my Sac State friends: Laura, Mike, Carl, Lesli, Ryan, Gabe, Tom, Melissa, Chris, and Dan – thank you so much for being there for me.

To my family: David and Jeanette Woodward, my sister Monica Wright, and my brother Timothy Woodward – I hope I made you proud.

To my interviewees: Ben, Darryl, Allen, Laura, and Terri – thank you for your time and contribution to this project.
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Chapter 1

INTRODUCTION

Purpose of the Study

In 2002, I started contracting for A. Teichert & Son, a construction and materials manufacturing company during their JD Edwards ERP implementation. The financial and accounting legacy systems from the 1990's were upgraded to Edwards' "OneWorld" system. I filled the "Solution Prints Team Lead" role (essentially, a Process Analyst) in the project management office. Through the mapping of process flows, I became acquainted with many of their business processes as they related to all of their business units. In 2003 as the project was winding down, I had the opportunity to join the Aggregates Department working for the Division Administrator as an Analyst. There, I assisted the Aggregates department in their transition to this new system and new chart of accounts by providing training and instruction to plant personnel. In 2004, I transferred to the Construction Department as the Operations Analyst, reporting to the Division Administrator. It was here in the Construction department that I began to work closely with the Corporate Finance Department and become more acquainted with their monthly financial processes. Part of my duties as Operations Analyst involve closing out the month and reporting information to the Finance Department such as profits, new work acquired, work on hand, and jobs bid for reporting to the Board of Directors.

As I began my studies in Finance at the Master's level, I began to observe the processes of my place of employment and compare them to the textbooks and case study examples presented in my classes. The process I heard the most complaints about in
Construction was the “Working Capital Carry Charge.” The Materials side of Teichert also has issues with the process, though not as many as Construction.

Problem

Though I had read about similar concepts in case studies and experienced the process in my own company, I had never heard of the exact process that Teichert uses. The Teichert Corporate office assigns a charge to the opportunity cost of capital (of having the potential capital or cash tied up in Accounts Receivable or inventory) and assesses the charge among the different divisions (Construction and Materials) within Teichert. The Finance department at the Corporate level (the department that calculates and assesses the charge) would say that the Working Capital Carry charge is meant to motivate Construction and Materials to collect their accounts receivable balances, particularly their older accounts receivable balances, reduce their inventory, and to perform their work on hand (which is work that Teichert has a contract for, but has not started). The Working Capital Carry charge is meant to provide the correct cash cycle visibility to the Plants and Districts. Because “profits do not equal cash flow,” (Higgins, 6), “the timely conversion of cash into inventories, accounts receivable, and back to cash is the lifeblood of any company” (Higgins, 6). In other words, it is supposed to cause them to feel the financial impact to their bottom line as their accounts receivable balances age and their billing slows and begins to lag behind the accumulation of costs.

Several problems have surfaced concerning this charge. The revenue producing business units (Construction and Materials) would say that this charge is merely a transfer of money to the District and Plant levels that is eventually eliminated at the
Teichert Inc. level. Both companies view it as a “stick” more than a “carrot”, which does not necessarily serve as motivation for increased collection. Construction would also say that the charge does not accurately reward and punish billing and collection efforts according to their unique business cycle. Corporate Finance calculates this charge using Excel spreadsheets and manually inputs the charge into the ERP system. Though a spreadsheet is used, this is considered a manual process because of the extensive human intervention required to make the process work. It is a calculation that takes time that may better be used for other analysis. Additionally, the Construction Districts have learned how the charge works and some have learned to manipulate the charge through overbillings. This charge manipulation will be discussed in detail further in this study.
Chapter 2

ORGANIZATIONAL ENVIRONMENT

Firm Background and Purpose

A. Teichert & Son or “Teichert” began in Sacramento, California in 1887 as a small one-man paving and stone masonry operation. John Julius Adolph Teichert (or “Adolph”) emigrated from Germany to the United States after learning the trade of stone masonry. Prior to starting his own company, he worked for the California Artificial Stone Company of San Francisco supervising the building of sidewalks around such notable California landmarks as Golden Gate Park and the State Capitol. He announced his intentions to provide stone masonry work under the business name of “Teichert.” He enjoyed early success in Sacramento, paving alleyways, carriage drives, and sidewalks. After Teichert’s son graduated from the University of California, Berkeley with an engineering degree and gained construction industry experience, he joined his father as his partner in the concrete paving business, hence the business name “A. Teichert & Son.” Teichert began to do highway construction work, expanding the company’s function and capabilities. Both Adolph and his son were founders of the Northern California Contractors Association, which was later associated with AGC (Associated General Contractors).

In 1915, Teichert opened an asphalt plant to help fill the need for their raw materials. At this time, they also experienced their first major financial loss on a construction highway project, which Adolph Jr. took full responsibility for by paying out
of his pocket. This type of conservative and fiscally responsible behavior and accountability would be a continuing theme into present times.

In the late 1920’s, A Teichert & Son incorporated and was issued California State Contractor’s license Number 8. Teichert holds this, the oldest active contractor’s license still today. The 1930’s saw Teichert expand into more material holdings, including the purchase of Perkins Rock Company and the manufacture of Readymix concrete. World War II drove demand for airports, runways, ammunition storage facilities, roads, utilities, and lighting. They were also successful in the 1940’s and 1950’s with several joint ventures throughout the Western United States. Teichert expanded into manufacturing Precast concrete products in the 1940’s as a means to recycle concrete and expand into a new market. The 1940’s and 1950’s also saw the death of three members of the Teichert family including Adolph Jr. and Adolph Sr. Henry Teichert, son of Adolph Jr. joined Teichert from the Sacramento based law firm McDonough Holland & Allen PC, where he was one of the original founding members.

In the 1960’s and 1970’s, the Mobile Equipment and Land Company portions of the company were established. The Teichert Ice Company, which was later sold, was also incorporated as part of the Teichert line of products. The Del Paso Rock Plant also ran out of material and was developed and reclaimed and later converted to the Corporate Office, which is still in existence today on American River Drive in Sacramento.

Today, Teichert is managed by the fourth generations of the Teichert family. Jud Riggs became President and CEO almost ten years ago after “spending 20 years working his way up through the ranks (Goldman, 4). The most recent additions to the Teichert
name include a partnership with Cheveraux Aggregates in Auburn and a Property Development company, Stonebridge Properties. In 2008, “Stonebridge Properties LLC, sought county approval for a zoning change on 106 acres of former surface mine property between Kiefer Boulevard and Jackson Road to allow houses and office buildings” (Shaw, 1). In 2005, “Teichert sold the first phase of lots at the Aspen IV mine site to Meritage Homes, which built a 113 acre gated community named Aspen Village” (Shaw, 2). As the market in California changes due to the recession, Teichert Construction’s balance of work has shifted from mostly “Private” subdivision and commercial work to mostly “Public” California state and county work. If the market shifts back to “Private”, Stonebridge will go ahead with their proposed second phase of selling more land, which currently lies at “the hub for conveyor belts bringing stone materials from several spurs where mining takes place to the east” (Shaw, 2).

Organizational Structure

In 1941, Teichert employed 300 people throughout the entire company. They hired conservatively over the years, suffering layoffs during the recession of the early 1980’s and during a severe housing decline in 1993. Their hiring peaked in 2002-2006, partially to backfill fulltime roles while the JD Edwards ERP implementation was underway. During this period and shortly after, they experienced records profits and hired to match that level of success.

In the Construction industry, seasonal layoffs are common and expected among field personnel. However, in 2008, the company began to lay off employees from all over the company. The layoffs came in phases and affected Construction, Materials,
Mobile Equipment, and Corporate Overhead known as “Joint Strategic Services.” This was in response to mounting complications and challenges from the housing crisis and recession. Currently, the company employs approximately 2,000 individuals.

Teichert is divided into Teichert Construction and Teichert Materials, each headed by a President as well as separate branches for Santa Fe Aggregates (an acquired materials company) and Stonebridge Properties, the property development branch of the company. Under the heading of Teichert Construction and Teichert Materials are five areas, each headed by a Vice President: Mobile Equipment, the Information Technology department (or I/S), Safety, Health, and Environmental (which also encompasses benefits and portions of Human Resources), Industrial Relations (dealing with labor and union issues) and Finance. Under the heading of Teichert Construction are nine separate Districts: Sacramento, Stockton, Woodland, Turlock, Fresno, Lincoln, Angelo Utilities – Placer Office, Angelo Utilities – San Joaquin Office, and the Heavy & Highway Division. Under the Teichert Materials heading are eleven main rock plants: Perkins, Grantline, Prairie City, Hallwood, Martis Valley, Marysville, Woodland, Esparto, Tracy, Vernalis, and Cool Cave. Teichert Readymix and Precast also falls under the Teichert Materials heading.

The executives and most administrative employees in the Human Resources and Finance Departments and those that are specifically assigned to support the Materials and Construction functions sit in the Corporate Office located in Sacramento. The District Offices, Plant, and field personnel refer to it unofficially as “The White House.” It is a name given to imply royalty, loftiness, arrogance, and waste. To be able to relate to the
people in the field, Plants and Districts; this is a challenge to which those employees in Corporate need to rise. In order to gain credibility and buy-in for processes, it is essential that those in Corporate based positions be able to relate to the people that actually perform the work that make the profits.

Firm Philosophy

Teichert’s slogan on their website reads “Building Trust since 1887.” “The company’s familiar lime-green and blue triangular logo, created decades ago by local graphics designer Audrey Tsuruda, adorns not only cement mixers and pickup trucks but also the souvenir programs and playbills of arts and charitable groups throughout the region” (Goldman, 4). Numerous internal presentations given by Teichert executives to employees in the last five years state that Teichert values its people, reputation, and competitiveness. Earlier iterations of the mission statement and values place people, service, and profit as the firm’s main priorities. They list their guiding principles as quality, customers, improvement, employees, affirmative action, safety, and integrity. Newer versions have reworded “affirmative action” as “diversity” and place safety at the top of the list. They pledge to do business honestly and with integrity, striving to make a fair profit. They have very little, if any debt and are a cash-rich company. They know that “companies that have enough working capital to fund their day-to-day business operations usually have a higher survival rate during tough times” (Corelli, 21) and they live this principle with their low debt to equity ratio. The Board of Directors and Shareholders in the company are the most important persons to please with the financial results.
Vertical integration is a key strategy in Teichert operations. It is unlikely that a Construction District would open unless a Teichert Aggregate plant was nearby to provide materials. The lack of material sources in the Bay Area, Southern California, and San Diego has been a reason that Teichert Construction has not expanded aggressively into this area.
Chapter 3
INTERNAL REPORTING SYSTEM

Flow of Reports Between Departments

Teichert's fiscal year begins on April 1st and ends on March 31st. Once a year, beginning in January, the Construction Division surveys the market to get an idea of the potential work available to bid. Each District puts together a plan for the work they will bid, the work they expect to procure, their expected expenses and how much profit they expect to make. Partially based on the work that Construction plans to bid, Aggregates plans their rock and hot mix asphalt production, and expected profits and expenses. The Readymix, Mobile Equipment, and Precast Divisions do the same and submit their budgets to Corporate Finance. Based on the budgets of the revenue producing business units, Corporate puts together their budget and enters the plan into the ERP system. Throughout the year, the actual financial results are compared to the budget that has been entered prior to the start of the fiscal year.

Quarterly, the Divisions formally present their actual results to the executive staff and answer questions regarding their performance. They are given the opportunity to project any changes to their budgets. These projections are entered into the ERP system and compared against the original budget entered at the start of the fiscal year. Going forward in the fiscal year, actual results are compared against both the projections and the original budget.

Monthly, several reports are produced and distributed throughout the company to provide financial and performance visibility to the Division Presidents and Vice
Presidents. These reports are also tools for the executive staff to use to gauge the progress of each Division.

Content of Reports

Several financial reports are produced monthly, quarterly, and yearly and distributed both within the company and outside to the shareholders. The Divisions also produce their own operations reports for distribution within their Division that show their key production statistics. This study will focus on the financial reports, particularly the one that shows the breakdown of the Working Capital Carry charge.

CER Report – this report lists the Capital Expenditures requested and purchased by Materials, Mobile Equipment, Aggregates, and Stonebridge properties. It tracks the original request amount against the actual dollar amount spent on the purchases. It is a manually created report that is published quarterly on the Teichert intranet.

Flash Report – this manually created Finance report is e-mailed to the executives monthly by the seventh working day and provides a preview of the Materials and Construction Division’s expected sales, work acquired, and other key financial statistics.

MOS – this is a report generated once a month by Finance with contributions from all Divisions. It is a complicated report that displays data in a Business Objects Crystal Reports format from the JD Edwards ERP system. Key statistics such as work on hand, work bid, work procured, Unsigned Construction Change Orders, unrul job costs, and Materials inventory are entered in the system through Journal Entries. The MOS (management operating statement) cannot be generated unless the Journal Entries have been posted. It is published to the Intranet by the twelfth working day of the month.
Contracts in Progress Report – this Crystal report shows a list of open and in progress contracts (or Construction jobs). It gives the company a good idea of how many Construction jobs remain, and sub sequently, how long the company can expect the work to last. This report is produced monthly, usually by the 18th working day.

DSO (Daily Sales Outstanding) Report – this report, published monthly by the 20th working day and produced by the Corporate Credit Department is a common report that several companies use as a key performance metric. The DSO number represents how many days on averages it takes to collect a customer payment. This report is combined with the Accounts Receivable aging report and distributed once a month.

Accounts Receivable Aging – this report is broken down by Division (Materials and Construction) and District (specific Plant and Construction District). It shows the top outstanding customer balances over $50,000.

There are more reports produced by Finance independent of Operations that are distributed to the shareholders. This study will focus on the DSO Report, Accounts Receivable Aging report and specifically, the Working Capital Carry charge that is assessed based on the data in these two reports.

Reporting System Rationale

The days for month end close, the fiscal year beginning and end dates, and the types of reports created have been existence since the Corporate Office moved to 3500 American River Drive in Sacramento in the late 1960’s. Over the years, dates such as A/R or A/P close have been adjusted here and there to meet business unit needs. Reports
are phased in and out, combined with other reporting concepts, automated, and discontinued.

Many of the processes performed at Teichert have continued because “this is the way we’ve always done it.” Processes are very slow to change at Teichert.

Detailed Description of Working Capital Carry Process

After the DSO and Accounts Receivable Aging reports are published, Finance calculates the Working Capital Carry Charge. The A/R Aging and DSO are always reporting one month in arrears. It takes one person four hours to calculate the Working Capital Carry charge for the entire company and do the corresponding Journal Entries. Three other people in the organization are cross-trained on the process. Journal Entries at the end of the process are necessary to record the charge in the correct ERP system accounts so the Management Operating Statement calculates correctly. If Construction and Materials were their own individual businesses, separated from the Teichert umbrella, they would not have the assurance of cash on hand to pay their bills. Teichert is an old, conservative, and cash-rich organization. If a Construction District or an Aggregate Plant loses money one month, the employees of that District or Plant will still be paid and the Accounts Payable balances will still be current. Under the Teichert Inc. name, any losses incurred by Districts or Plants are “taken care of.” Because of this unique situation, Teichert Inc. chooses to assess one charge against Accounts Receivable Balances past due, inventory unsold, retention held, and costs in excess of billings. In essence, Teichert Inc. acts as a bank of sorts and charges interest for the opportunity cost of having any potential cash tied up in receivables, unbilled costs, retention, and unsold
inventory. They attempt to quantify to the Districts and Plants a cost for “using” their cash in hopes that Materials and Construction will be motivated to collect any past due balances, release retention, and either sell or reevaluate the value of any unsold inventory.

This iteration of the Working Capital Carry Charge has been in practice for approximately 15 years, with minor changes. Prior to that, there was a charge, but the calculations were different. Teichert, with direction from the CEO and CFO wants people to be concerned about cash flows and to assume ownership for working towards a positive cash flow.

To calculate the chargeable balance for Construction, the current month and 30-day-old accounts receivable balances are ignored. The A/R Balance 60-89 days old is calculated and multiplied by 1.5. Balances older than 90 days are multiplied by 2.5 and this number is added. Balances older than 90 days are assessed more severely than the 60-89 day balances because there is more of a risk that these balances may not be collected. The “retention” balance (the amount that customers can hold back from Construction until the job is completed) is multiplied by 50%. Since it is likely that retention will be released once a job is completed, it is not perceived as risky as past due accounts receivable balances. “Costs in Excess of Billings” are added to the running total. Another way to view costs in excess of billings is to think of this amount as being money “loaned to customers in the form of underbillings” (Dexter, 1). Billings in Excess of Costs (or overbillings) are multiplied by 1.15 and subtracted from the total. Since it is favorable to bill aggressively in the Construction Division, and essentially “borrow” cash “from customers and vendors in the form of accounts payable and over-billings” (Dexter,
1) this action is awarded. Extraordinary adjustments are made if a delinquent customer account enters litigation for unpaid balances. If all contract considerations were met on the contract before the litigation began, any balances 90 days and older being multiplied by 2.5 are reduced to 1.5 starting 60 days after the final billing to the delinquent customer once the liens have been filed or legal action has been taken. If all contract considerations were not met prior to the beginning of litigation, the unpaid balance older than 90 days continues to be multiplied by 2.5. One year after the final billing, whether contract considerations were met or not, the unpaid balance is excluded from the charge in an “extraordinary adjustment” line item. These numbers are totaled. This is known as the chargeable balance. The chargeable balance is multiplied by the prime rate (established at the beginning of the fiscal year) + 1% and divided by twelve. Prior to the arrival of the new CFO in 2005, one-half of the prime rate was used to calculate the charge. This charge is displayed on the MOS as a line item and directly affects Construction’s bottom line.

For Materials, calculating the chargeable balance is slightly easier than with Construction. The Accounts Receivable balance aged 30-59 days is multiplied by one and added to the balances 60 days and older which are multiplied by two. Their current inventory on hand is multiplied by hand and added to the total. Any extraordinary jobs or accounts with pending legal issues are accounted for and subtracted from the total. Materials does not deal with retention, Costs in Excess or Bills in Excess like the Construction division.
Relevant Parts of the Environment

As stated previously, certain processes in Teichert, in the Finance department and otherwise have persisted so long because changes are slow to be made and implemented. Construction, Materials, and Corporate have debated all aspects of this charge, from the percents and how it is calculated to the need for having the charge at all. For the most part, the decision to continue assessing the charge has been made by the executives and upheld for over 15 years. It is unlikely that the Working Capital Carry charge will be discontinued. Keeping this in mind, there is still a lot of room for improvement.

Transaction Detail

For Readymix, Precast, and Aggregates (the companies of the Materials Division) the Accounts Receivable Aging Balance (the balances older than 60 days) and the inventory balances are totaled and multiplied by the predetermined chargeable numbers to obtain the chargeable balance. Manufacturing oriented companies such as the companies that comprise the Materials Division have tangible inventories which make calculating a chargeable balance relatively straightforward. Unlike Construction, Materials does not deal with retention held by customers on a job or project. The Materials Division sells products and does not perform work over a period of time like the Construction Division. Table 1 - Sample Working Capital Carry Charge shows a sample monthly report for the companies who comprise the Materials Division. These
are created dollar amounts, however the calculation used is identical to the one that Teichert uses.

**Working Capital Carry Charge Example**
*For the month of February 2009 (Using beginning of the month balances - as of January 31, 2009)*

<table>
<thead>
<tr>
<th>Accounts Receivable Aging</th>
<th>Precast</th>
<th>Readymix</th>
<th>Rock Products</th>
<th>Materials Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>January (current month)</td>
<td>383</td>
<td>363</td>
<td>3360</td>
<td>7606</td>
</tr>
<tr>
<td>December (1 month)</td>
<td>388</td>
<td>362</td>
<td>963</td>
<td>1413</td>
</tr>
<tr>
<td>November (2 months, Old Balances)</td>
<td>65</td>
<td>368</td>
<td>3058</td>
<td>3781</td>
</tr>
<tr>
<td>October &amp; prior (3 months, Old Balances)</td>
<td>383</td>
<td>336</td>
<td>2333</td>
<td>3054</td>
</tr>
<tr>
<td>Total</td>
<td>919</td>
<td>4911</td>
<td>10014</td>
<td>15964</td>
</tr>
</tbody>
</table>

**Chargeable Balance Calculation**

<table>
<thead>
<tr>
<th>Accounts Receivable 1 Month Old Weighted</th>
<th>Precast</th>
<th>Readymix</th>
<th>Rock Products</th>
<th>Materials Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add: Old Balances Weighted</td>
<td>2.0</td>
<td>896</td>
<td>1412</td>
<td>13690</td>
</tr>
<tr>
<td>Add: Inventories Weighted</td>
<td>1.0</td>
<td>6679</td>
<td>565</td>
<td>53134</td>
</tr>
<tr>
<td>Less: Extraordinary Adjustments</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total: Chargeable Balance</strong></td>
<td>7563</td>
<td>2339</td>
<td>58235</td>
<td>68237</td>
</tr>
</tbody>
</table>

**Carry Charges:**

<table>
<thead>
<tr>
<th>Monthly Interest Rate</th>
<th>Precast</th>
<th>Readymix</th>
<th>Rock Products</th>
<th>Materials Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.69%</td>
<td>0.69%</td>
<td>0.69%</td>
<td>0.69%</td>
<td>0.69%</td>
</tr>
<tr>
<td>Actual Carry Costs - Month</td>
<td>52.4</td>
<td>37.9</td>
<td>365.7</td>
<td>476.1</td>
</tr>
<tr>
<td><strong>Carry Charges Assessed - Month</strong></td>
<td>52.9</td>
<td>16.1</td>
<td>401.8</td>
<td>470.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Working Capital Carry Budget - Month</th>
<th>Precast</th>
<th>Readymix</th>
<th>Rock Products</th>
<th>Materials Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.7</td>
<td>12.9</td>
<td>278.9</td>
<td>337.5</td>
<td></td>
</tr>
<tr>
<td>Variance Favorable (Unfavorable) - Month</td>
<td>(7.2)</td>
<td>(3.2)</td>
<td>(122.9)</td>
<td>(133.3)</td>
</tr>
</tbody>
</table>

**Table 1 - Sample Working Capital Carry Charge - Materials**

Rock Products has the most inventory and earns the most revenue of the Materials Companies. It makes sense that it also carries the most charge. Precast earns the least amount of revenue for the division, yet its charge is not proportional to this fact. This is partially a function of the market demand and the material required to make the products. It will be discussed further in the “Negative Aspects” section.

Calculating the Construction Working Capital Carry charges for the Construction Districts is more complicated than for Materials. In addition to the Accounts Receivable balances older than 60 days, Retention is also a factor, as well as Costs in Excess of Billings and Billings in Excess of Costs. These terms are defined in more detail in the
“Negative Aspects” section. Construction has a complicated manufacturing value chain and a somewhat unclear money exchange and cash flow. A basic cash model, adapted for the Construction industry might look like this:

**Basic Cash Model**

- Earnings
- +/- Changes in A/R
- +/- Changes in Inventory
- +/- Changes in Net Work in Progress (WIP)
- +/- Changes in Fixed Assets
- +/- Changes in A/P
- +/- Changes in Accruals
- +/- Changes in Debt
- = CASH FLOW

**Table 2**

Department, collections have been increased and prioritized.

<table>
<thead>
<tr>
<th>Accounts Receivable Aging</th>
<th>Sacramento</th>
<th>Stockton</th>
<th>Woodland</th>
<th>Construction Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>January (current month)</td>
<td>884</td>
<td>4845</td>
<td>3737</td>
<td>9465</td>
</tr>
<tr>
<td>December (1 month)</td>
<td>3003</td>
<td>3634</td>
<td>4350</td>
<td>10987</td>
</tr>
<tr>
<td>November (2 months, Old Balances)</td>
<td>864</td>
<td>358</td>
<td>88</td>
<td>1310</td>
</tr>
<tr>
<td>October &amp; prior (3 months, Old Balances)</td>
<td>4447</td>
<td>3078</td>
<td>863</td>
<td>8388</td>
</tr>
<tr>
<td>Retention</td>
<td>8735</td>
<td>8744</td>
<td>6588</td>
<td>24067</td>
</tr>
<tr>
<td>Total</td>
<td>17933</td>
<td>20658</td>
<td>15626</td>
<td>54217</td>
</tr>
</tbody>
</table>

**CIE/BIE:**

- Costs in Excess of Billings
- Billings in Excess of Costs

<table>
<thead>
<tr>
<th>CIE/BIE</th>
<th>Sacramento</th>
<th>Stockton</th>
<th>Woodland</th>
<th>Construction Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs in Excess of Billings</td>
<td>548</td>
<td>2409</td>
<td>1908</td>
<td>4865</td>
</tr>
<tr>
<td>Billings in Excess of Costs</td>
<td>(16733)</td>
<td>(8922)</td>
<td>(15892)</td>
<td>(41547)</td>
</tr>
</tbody>
</table>

**Chargeable Balance Calculation**

<table>
<thead>
<tr>
<th>Accounts Receivable 2 Months Old Weighted</th>
<th>1.5</th>
<th>1296</th>
<th>537</th>
<th>132</th>
<th>1965</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add: Old Balances Weighted</td>
<td>2.5</td>
<td>11118</td>
<td>7696</td>
<td>2156</td>
<td>20970</td>
</tr>
<tr>
<td>Add: Retention Balance (% of actual)</td>
<td>0.5</td>
<td>4368</td>
<td>4372</td>
<td>3294</td>
<td>12034</td>
</tr>
<tr>
<td>Add: Costs in Excess of Billings</td>
<td>1.0</td>
<td>548</td>
<td>2409</td>
<td>1908</td>
<td>4865</td>
</tr>
<tr>
<td>Less: Billings in Excess of Costs</td>
<td>1.15</td>
<td>(19243)</td>
<td>(10260)</td>
<td>(18276)</td>
<td>(47779)</td>
</tr>
<tr>
<td>Less: Extraordinary Adjustments</td>
<td></td>
<td>(953)</td>
<td>(309)</td>
<td>(1262)</td>
<td></td>
</tr>
<tr>
<td>Total: Chargeable Balance</td>
<td></td>
<td>(2867)</td>
<td>4753</td>
<td>(11093)</td>
<td>(9208)</td>
</tr>
</tbody>
</table>

**Sample Working Capital Carry Charge**

- Carry Charges;
- Monthly Interest Rate
- Actual Carry Costs - Month
- Carry Charges Assessed - Month

<table>
<thead>
<tr>
<th>Carry Charges:</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly Interest Rate</td>
<td>0.69%</td>
<td>0.69%</td>
<td>0.69%</td>
<td>0.69%</td>
</tr>
<tr>
<td>Actual Carry Costs - Month</td>
<td>127.5</td>
<td>159.2</td>
<td>121.0</td>
<td>407.7</td>
</tr>
<tr>
<td>Carry Charges Assessed - Month</td>
<td>(19.8)</td>
<td>32.8</td>
<td>(76.9)</td>
<td>(63.9)</td>
</tr>
</tbody>
</table>

**Table 3 - Sample Working Capital Carry Charge - Construction**

1 This table was adapted using information from Lords, Steven D. “Cash Flow Formula, Part 1: How to Measure Cash.” CFA Building Profits, January/February 2009.
Table 2 – Sample Working Capital Carry Charge – Construction contains the calculations for three Districts. The numbers are created, but the table contains the actual charge that Teichert uses. Note that in this example, the charges assessed number is a credit balance. This does happen if Construction has been diligent on billing. “Keeping jobs in a slightly overbilled situation to ensure that you cover all incurred expenses” (Brown & Evoniuk, 79) is one of the Construction industry’s key operating principles. Because “bills in excess” of costs is favored and rewarded in the calculation of the charge, it is possible to have the charge work to a Division’s advantage. A credit balance can also happen in profit has been underreported, as discussed in the “Negative Aspects” section.

Negative Aspects

From a Materials perspective, other than taking away from their reported bottom line profit, the Working Capital Carry charge fits their business model. Because of the nature of the product produced, Readymix carries very little inventory in the form of asphalt oil, a component of the final product. Readymix is not capable of significant inventory reduction efforts, making their only opportunity for Working Capital Carry reduction collecting past due Accounts Receivable balances. Aggregates (Rock Products) has piles of processed rocks as inventory. These “piles” are measured every month, numbers are calculated and recorded as Journal Entries into the system. When demand for material goes down, Aggregates can respond to this demand reduction by producing less rock, thereby carrying fewer inventories and accumulating fewer charges. Aggregates uses a LIFO system of calculating the cost of their inventory. They use this for the lower income tax advantages it provides. The decision to shut down production
carries other costs to the organization unrelated to the cost of capital. The Precast Division has been affected the most inventory wise by the recent downturn in the Subdivision market. Precast manufactures concrete components for sewers and underground subdivision related utilities. With the sudden downturn in the housing market, demand for the Precast products dramatically decreased. As a result, Precast is stocked to sell at high levels. Their inventory could be considered “obsolete”, at least in the near future. They must make a decision to either write off the inventory, or continue to be charged the carry charge. Writing off the inventory would mean a large financial hit in the short term, but a savings of interest charges in the long term and 100% profit potential when it does sell. Inventory management is the largest issue that Materials has concerning the Working Capital Carry charge.

The Construction Division has far more complaints about this process than the Materials Division. In general, “traditional accounting measurements do not provide the necessary context to fully evaluate a job’s progress” (Daneshgari & Wilson, 26). This is because of the delay that often results between the time the work occurs and accounting information is compiled. This is an issue that all Construction companies face and is one not unique to Teichert. More specifically, the Construction Division’s complaints with the Working Capital Carry Charge also relate to the accounting/job cost recognition disconnect. First, some Construction specific terms need definition. Retention is the money that owners (customers for the work that Construction is performing) hold back in case something goes wrong on a job. It is typically 5-10% of the contracts values or securities (escrow) in lieu of cash retention. “CIEBIE” stands for “Costs in Excess, Bills
in Excess” and is a measure of costs spent versus billings collected. Costs plus profit on a job is either more than a District has billed or less. If it is more, this means a Construction job has spent more than it have collected. If Construction overbills and collects money before work is actually performed, this process is rewarded.

Specifically, Construction has identified five issues as being problematic.

- The way the Working Capital Carry charge is calculated has incentivized them to hold back in reporting their profit. Since “CIE” is really “Costs plus Profit”, it is possible for a job to be 100% complete, but show that they are 95% completed on the books. It is easy to show more billings on the job when profit has not been included. Keeping this in mind, it is still important for a District to be profitable. A District has certain profit budgets that it needs to meet, but if a District is meeting its budget, it may decide to “reserve” some profit for another month.

- It is the nature of Construction to deal with many Subcontractors on a job and to operate in a “Pay when Paid” environment. In other words, a Division may incur costs on a job that do not really belong to them. When they receive payment, a Division will then turn around and pay the Subcontractor doing work on the project. Though the costs have been incurred in February, for example, an owner may not pay until May when the work has been completed.

- When paying employees, the payroll and fringe budgets are calculated for a month. In reality, fringes are paid out once a month and payroll wages are paid to Construction employees once a week. In the cost budget, it appears that
Construction spent a certain amount in one month, when in reality the costs we spread over a couple of months.

- When Construction buys materials from an outside Aggregates manufacturer such as Western Aggregates, the material arrives on the job in a day, but payment may not be required for sixty days. Meanwhile, Construction may collect the money from the job owner for the material before the Western Aggregates invoice is paid by Teichert. When materials are purchased from within Teichert, the transaction is internal and usually commences within one or two days. Materials are delivered to the job and payment is received from Construction to Materials that same day or the next. The potential customer discount from Materials to Construction sometimes does not outweigh having to pay for the material within a day or two. Teichert Construction has paid for the materials but often has not received reimbursement from the owner. From a cash flow perspective, it is better to buy from the outside.

- To perform the Working Capital Carry charge calculation, Finance, with the help of the Accounts Receivable Aging report takes all accounts receivable balances and divides them into categories by how many days they have aged. These accounts are not broken down by job number, making it impossible for Construction to see which job is contributing the most to the Working Capital Carry Charge. They may be able to see the customer account that is the furthest past due, but they cannot see which jobs are associated. This decreased visibility makes it difficult
to single out which jobs are hurting a District the most. This has been a major complaint in the Division for several years.

Though Construction has several issues with the Working Capital Carry process, since the CFO’s change to the prime rate, Finance believes that this has helped the Districts to pay more attention to collections, billings, and cash flow.

There are also issues with this process from the Corporate Finance perspective. It is exceedingly difficult to track the “exception” jobs and customers (the Extraordinary Adjustments line) on the Working Capital Carry reports. Though some calculations come from the system in the form of the A/R Aging report, most of the calculations are performed manually in an Excel spreadsheet. Any Construction jobs entering litigation or with aging past due Accounts Receivable balances at major risk of not being collected has to be tracked in a list in a spreadsheet. As the state of the economy worsens and more jobs enter litigation proceedings, it becomes more difficult for Finance to keep track of these exceptions.
Chapter 5

PROPOSED SOLUTION AND IMPLEMENTATION

Proposed Solution

Both Operations and Corporate have a stake in the Working Capital Carry process. There is no "one size fits all" solution that will satisfy all concerns, but there is a way to improve the process and address many of the concerns. Interviews with both Operations and Corporate indicate that all groups accept the charge, for the most part. It is not an option at this point to discontinue this process.

Finance has effectively cross-trained their staff on the Working Capital Carry calculation process. Four people in the department know how to perform this calculation. An area for improvement for this group is to move away from using Excel to calculate the charge and move towards using the JD Edwards system. Though this charge is somewhat custom and specific, there are still opportunities to automate the process. JD Edwards has what are called "category codes" in its structure. Certain jobs or accounts are identified by a series of numerical codes. For example, number 1 in Category code five stands for "Lincoln" while number 2 stands for "Stockton." Codes could be created for "Working Capital Carry Exclusion" to easily filter out the jobs for Construction which should not be included as part of the charge calculation. Because the DSO and A/R Aging reports are part of the numbers used to calculate the Working Capital Carry charge, these two reports should be combined and re-written with Crystal reports, Teichert’s chosen reporting package. Doing this will enable the charge to be calculated
using the system instead of Excel and manual intervention. Moving this report to a system-generated report will cut hours from the calculation process.

Materials’ main issue with the charge revolves around their inventory and being penalized for having it on hand. Their concerns could be addressed by defining a process for when to write off inventory. Factors such as how long the inventory has been on hand, the future demand for the product and the likelihood that it will sell are all points to be considered when defining this process. Case by case exceptions can be made, but having rules for inventory write-offs would help to eliminate any confusion. Materials could also help address one of Construction’s concerns with buying material internally. As discussed previously, there is no cash flow benefit to Construction for buying from Teichert Materials as the charge is internal and almost instantaneous. To remedy this, any internal transfers between companies could be delayed by 15-20 days. Construction would have the benefit of keeping their cash on hand longer and delaying payment to Materials. Materials would still be paid in a timely fashion and would not have their DSO affected.

Construction is essentially a service organization. The anatomy of their business does not neatly conform to the structure of the Working Capital Carry charge. However, process improvement can still happen from Construction’s point of view. It has long been the complaint from all Construction Districts that there is no job visibility when reviewing the Working Capital Carry Charge. A Crystal report that shows such job detail visibility is in the process of being developed. This will give the Districts their required
visibility and help them to focus on the most problematic jobs, those that are contributing
the most to the penalty.

Oftentimes, payments from owners on a Construction job are received directly at
the District offices. However, the payments are not processed at the Districts and are
instead sent straight to the Corporate office for processing. This results in a delay of days
before a District receives “credit” for collecting a payment. The concept of
“concentration banking” may be explored, where “customers would make payments at
a firm’s regional offices rather than its corporate headquarters” where the Districts would
“deposit the checks into their local bank accounts” (Baker & Powell, 175). Periodic
transfers would occur from these local banks to “a concentration account at one of the
company’s concentration banks” (Baker & Powell, 175), or in Teichert’s case, their main
bank account. The copies of the check received could be scanned and sent to Corporate
before the checks are deposited in the local accounts, keeping Corporate Finance in the
loop. “Automated clearinghouse” (ACH) transfers (Baker & Powell, 175), which
Teichert already uses to transfer money into the accounts of employees who have opted
for direct deposit could also be used to transfer customer payments from the local
accounts to the main account. This would help to reduce payment processing float,
which may mean the difference between an account that is 89 days past due (and assessed
for the Working Capital Carry charge at a lower rate) and one that is 90 days past due
(which is assessed at a higher rate).

There exists payment-processing software that “allows vendors to forgo paper
invoices and file for payment electronically” (Myers, 3). This process can go both ways
and allow vendors to submit their payment electronically to Teichert, further reducing processing float. Whether a software implementation would be financially beneficial to Teichert at this time is up to the discretion of the executives.

The “pay when paid” subcontractor issue is an issue unique to Construction. This may be an area where compromise with Finance is necessary. “Pay when paid” is a normal part of doing business in Construction. Costs that do not technically belong to Teichert are incurred and at times, the balances age before the owners pay. The question must be asked by the Districts if this makes enough of a difference to their bottom line to warrant another conversation with Corporate Finance. As far as the underreporting of profit, this is also something that does happen in the Construction industry. Any obvious and blatant holding back of profit will be picked up through the internal audits conducted in Construction on a monthly basis. The Construction Districts are also audited in detail by the dedicated Construction Auditor/Trainee once a year to make sure they are following proper financial procedures. Any blatant Working Capital Carry Charge manipulation should be added to the scorecard for the yearly audit.

**Implementation**

The first change to this process should be made in the Finance Department. Behind the scenes, JD Edwards category codes to indicate Construction jobs to be excluded from the charge need to be defined and set up. The category codes then need to be assigned to the jobs. Crystal Reports need to be developed and written, in-house if possible, to make future maintenance and changes on these reports possible by current employees. If consultants are used to develop the reports, the process and logic behind
the reports need to be defined and documented. After report testing in the Finance Department is completed, Operations should be shown the new reports and solicited for suggestions or changes. After the final changes are made, the Reports should be published and used. Regarding the Journal Entry done after the charge has been calculated in order to correctly populate the system accounts, two solutions may be possible. Either the Crystal Report that calculates the charge could be formatted to be exported into Excel and easily pasted into the system or a custom JD Edwards process could be written by Teichert’s in-house programmers to automatically pull the numbers from the Crystal report and create the Journal Entry.

Construction and Materials should dialogue with each other concerning internal material purchases. It may be possible for these groups to reach a compromise regarding timing of the payments. Materials should also define the rules for deciding which inventory should be written off, therefore reducing their liability.

Automating this process through expanded ERP system use and custom reports would go a long way to cut down on the amount of time spent in Finance calculating this charge.
Chapter 6

SIMILARITIES WITH OTHER ACCOUNTING CONCEPTS AND CONCLUSION

Similarities With Other Concepts

Charging a manufacturing based company for the opportunity cost of capital is a common accounting practice. How the charge is calculated and assessed, however is different for all companies. What complicates Teichert’s process is adding in the complicated aspect of having a service organization under the same corporate umbrella as a manufacturing organization. The closest academic subject found related to Teichert’s unique charge is the concept of “Noncontrollable costs” in a manufacturing environment. Construction and Materials’ Working Capital Carry Charge is partially noncontrollable, in that they cannot control the fact that a charge exists, but there are some factors of it that are controllable. According to the book Managerial Accounting Third Edition, a manager should not be evaluated unfavorably if a noncontrollable cost sharply increases” (Jiambalvo, 11). The only way the Working Capital Carry Charge could increase would be if collections slowed, DSO went up, Retention Balances increased, the interest rate was reevaluated, or inventory levels rose. All of these factors except a rising interest rate or a change in market demand for certain inventories may indeed be measures of a manager’s performance or cause for an unfavorable evaluation.

Teichert’s Credit Department employs a wide range of methods for determining a client’s creditworthiness. Extensive prequalifications, credit applications, and a multitude of reference checks are used. Should a client default, they also use many tactics for collecting what is owed to Teichert. The Districts also play a large role in
collections, mostly in the beginning phases of a customer’s delinquency. Prior to this step, they “negotiate contracts so they are contractually able to bill earlier” and “provide the owner with a front-loaded billing schedule that provides for stronger billings in the early stages of the project” (Lords, 15), two negotiating tactics meant to increase cash flow. After a District has exhausted all options and means available for its use, legal action is taken. “The firm may seek a legal judgment against the debtor if there is substantial expense involved,” (Baker & Powell, 180). “Legal action could force the delinquent customer into bankruptcy,” (Baker & Powell, 180); something along with property liens and asset seizures that Teichert has used in the past to collect debts.

Midway through 2009, CFO Magazine reported that U.S. companies “freed $62.7 billion from their working capital” (Myers, 1). “Squeezed by a slowing economy and nearly frozen credit markets” (Myers, 1), the focus for companies turned to cash, collections, and inventory reduction. The methods these companies used are similar to the ones Teichert uses to focus on collections. Church & Dwight Co., the makers of Arm & Hammer Baking Soda “started focusing on the difficult economic environment early in the fall” and everyone “turned their attention to it, and made cash their front-and-center focus” (Myers, 1). In 2007, members of Corporate Finance at Teichert met with key Construction District and Material Plant personnel and turned their focus towards the importance of the collection of cash as well. “It’s a fatal fact of life that more contractors go out of business because of a lack of cash flow than a lack of backlog or profit” (Stagliano, 75). Getting members of a team on the same page goes a long way towards
making positive improvements. What results is that “everyone becomes part of the cash management process” (Lords, 18).

“Within a cash management and forecasting context, cash is defined as spending power – a measure of an entity’s ability to consummate transactions for goods and services,” (Lords, 12). Thinking about cash this way instead of simply “cash and other marketable securities with maturities of less than one year” (Lords, 12) is a beginning to changing peoples’ fundamental concept of how cash should be viewed in an organization.

Conclusion

A. Teichert & Son has many advantages over its multitude of competitors, not the least of which is their strong financial position. This position is enforced by placing a high importance on having adequate cash reserves, making sure the creditworthiness of debtors is achieved, and by making collections the job of both Operations and Corporate Administration.

Without a doubt, Teichert’s Working Capital Carry Charge is a unique, almost one-of-a-kind process. This is partially because many companies are simply not in Teichert’s cash position – rich enough to cover the shortfalls of their subsidiaries, Districts, and Plants. Any other company or a District that happened to break away from under the Teichert Corporate umbrella may have to borrow money from a financial institution to pay their debts. Materials and Construction do not have to feel this financial pain and so Corporate artificially creates that in the form of the Carry Charge that directly affects a District or Plant’s bottom line. Complaints about an expense that affects a District or Plant’s bottom line are to be expected. It is through these complaints that
process improvement can begin, creating efficiency to better match the needs of the business units.

In every procedure that gets implemented, every process that is improved upon, a company must ask if it is promoting the desired behavior or creating loopholes in the process for cheating and manipulation. Periodic process evaluation after the implementation of a new process should be employed to test the improvements made and reevaluate any steps if necessary.

This is the mark of a great company – to change with the times and grow, striving for improvement but staying true to its mission and principles.
APPENDIX

Teichert Organizational Chart
BIBLIOGRAPHY


