



MIDDLE EAST TECHNICAL UNIVERSITY
DEPARTMENT OF ECONOMICS & SCIENCE AND
TECHNOLOGY POLICIES RESEARCH CENTER



12th Annual Conference on Economics and Security

Book of Abstracts

Date:

JUNE, 11st and 13th 2008

Place:

METU-CULTURE AND CONVENTION CENTER, ANKARA

ORGANIZATION COMMITTEE:

Assoc.Prof.Dr. Erkan ERDİL

Assoc.Prof.Dr. Nadir ÖCAL

Prof.Dr. J Paul DUNNE

Assoc.Prof.Dr. Jülide YILDIRIM



SPONSORS:



www.stps.metu.edu.tr/conference08

Sturm Ruger & Co: Financial Analysis of a Major Firearms Manufacturer

D. Kahraman

Afyon Kocatepe University, Afyon, Turkey; corresponding author, e-mail: dkahraman@aku.edu.tr

J. Brauer

Augusta State University, Augusta, GA, U.S.A.

P. Hall

Australian Defence Force Academy, University of New South Wales, Canberra, Australia

P. Basciano

Augusta State University, Augusta, GA, U.S.A.

S. Markowski

Australian Defence Force Academy, University of New South Wales, Canberra, Australia

Abstract:

Sturm Ruger & Co is a major American firearms manufacturer (handguns and longguns). It is one of the very few gunmakers whose shares are publicly traded and is the world's only pistol and rifle manufacturer for which financial records are publicly available as far back as 1994. While criminologists, political scientists, economists, and others have debated the many consequences of firearms misuse and abuse, especially with regard to nonconventional conflict, civil war, and urban crime, virtually no literature exists on the operations of gunmakers that supply an important input to these activities. This paper examines a consistently successful gunmaker and uses the information to help assess the larger U.S. and global firearms industry.

Keywords: Financial analysis, market analysis, firearms, small arms, Sturm Ruger & Co

Introduction

Handguns and rifles are the majors killers in violent, armed conflict today.¹ However, surprisingly little research has been conducted on the businesses that make handheld firearms. An initial analysis of manufacturers in the United States — among the largest, if not the largest, supplier of firearms in the world — suggests that the market is very competitive, and that firms struggle, not just with profitability, but — ironically — with survival.² For example, the economic fortune of Colt’s Firearms has fallen drastically, and the company is now split into two legally separate entities tending to the civilian and to the law enforcement and military firearms market, respectively, called Colt’s Manufacturing LLC and Colt’s Defense LLC. Smith & Wesson, an iconic firearms maker, has changed ownership repeatedly in recent years, and is still struggling. Remington, another big-name manufacturer, has struggled with profitability as well.

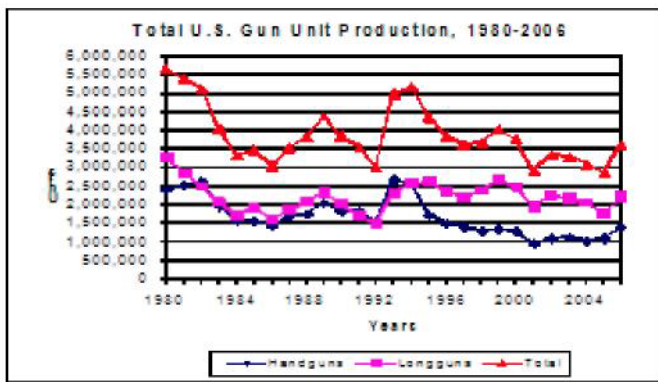


Figure 1: Total U.S. nonmilitary guns unit production, 1980-2006

Source: compiled from BATF annual reports

The market is characterized by sharp swings in civilian demand, “lumpy,” peak-load military demand that strains firms’ ability to smooth production, constant pressure for innovation (e.g., plastic components; laser range-finder add-ons), market segmentation of customers (e.g., high-end, low-end guns; marketing to youth and women), recent attempts to wring economies of scope (e.g., co-branding of hunting gear, clothing lines, and other accessories) out of the market, drastically increased import pressure, and other features.

Pistols Produced	2006	2004	2003	2002	2001	2000	1999	1998
SMITH & WESSON CORP	1	2	5	5	3	4	3	2
SPRINGFIELD INC	2		4	7	9	11	16	18
STURM, RUGER & COMPANY, INC	3	1	1	1	1	1	1	1
BEEHILLER INC	4	5	3	6	5	6	10	11
BERETTA U.S.A. CORPORATION	5	4	2	2	4	3	2	3
KEL-TEC CNC INDUSTRIES INC	6	6	9	9	6	8	11	13
KIMBER MFG INC	7	7	8	8	8	7	7	10
COBRA ENTERPRISES OF UTAH, INC	8		12	12	20			
ARMIS TECHNOLOGY INC	9	9	11	10	7	13	13	12
JIMENEZ, PAUL J	10	21						
HASKELL MANUFACTURING INC	11	11	15	18	13	18	20	21
SAELO, INC	12	12	13	15	12	20	23	19
COLTS MANUFACTURING CO LLC	13	17	14	11	10	10	6	6
IBERIA FIREARM & INC	14	14	17	16	18	23		
PHOENIX ARMS	15	15	16	13	19	12	12	8

Figure 2: Rankings of U.S. pistol manufacturers, 1998-2005

Source: compiled from BATF annual reports (AFMER).

The United States Bureau of Firearms, Alcohol, Tobacco, and Explosives (still known by its former acronym, BATF) collects data on U.S. manufacturers’ unit production of handguns (pistols, revolvers) and longguns (shotguns, rifles). Figure 1 shows the data from 1980-2006 (the latest

available).³ A huge drop-off in production and sales occurred through the mid-1980s, followed by a runup during the second term of the Reagan administration, a fall-off with the end of the Cold War and the U.S. recession preceding the first Gulf War. With the onset of the Clinton administration,

Rifles produced	2006	2005	2004	2003	2002	2001	2000	1999	1998
REMINGTON ARMS	1	1	3	1	3	1	3	3	3
MARLIN FIREARMS	2		2	3	2	2	2	2	2
STURM, RUGER	3	2	1	2	1	3	1	1	1
SAVAGE ARMS, INC	4	3	4	5	5	5	4	5	5
ARGUS PUBLICATIONS INC	5	4		7	6	6	7	7	6
H & R 1871, LLC	6		6	6	7	7	8	8	8
THOMPSON CENTER ARMS	7	7	7	8	9	9	12	13	11
DPMS INC	8	10	13	21	17	19	18	19	19
BUSHMASTER FIREARMS	9								
KEYSTONE SPORTING ARMS	10	8	9	10	10	12	14	17	15
O F MOSSBERG & SONS INC		11	9	12		25			
STAG ARMS LLC	12	16							
LEGACY SPORTS	13								
ROCK RIVER ARMS INC	14	12	17	14					
CENTURY ARMS INC	15	25	14	12	12	10	11	12	
BUSHMASTER FIREARMS	16	6	8	9	8	8	9	6	10
BEEMILLER INC	17		10	17	11	11	13	9	9
SPRINGFIELD INC	18	11		13	13	15	15	14	16
ARMALITE INC	19	17	15	15	15	14	16	15	14
KIMBER MFG INC	20	13	16	18	19	21			

Figure 3: Rankings of U.S. makers, 1998-2006.

Source: compiled from BATF annual reports (AFMER).

fears of gun-carrying restrictions resulted in a huge production and sales boom, to be followed by a gradual but continuous decline throughout the remainder of the 1990s and into the first half of the 2000s. This reversed only with the data point for 2006. A noticeable feature of the data is the evident split in the handgun and longgun series as from 1994 onward. Handgun production dropped from about 2.5 million units a year to about 1 million units. There are probably two factors responsible for this: first, producers of so-called Saturday Night Specials (that is, cheaply produced and sold handguns) came under tremendous legal pressure, and many were sued out of business in the 1990s; second, foreign-owned firms (e.g., Beretta of Italy, SigSauer (now Sig Arms) of Switzerland, Glock of Austria, and Taurus of Brazil) began to make drastic inroads into the U.S. market, taking market share from the likes of Smith & Wesson and Colt.⁴

Volatility among U.S. manufacturers may be gauged by examining, for instance, changes in unit production and sales ranks. Figure 2, for pistol manufacturers, compiles the data for the eight years, 1998 to 2005. Evidently, a considerable amount of movement occurs within the ranks. While Smith & Wesson, Sturm Ruger, and Beretta's ranks are fairly constant, companies like Springfield, Beemiller, Kel Tec, and others have moved up the rankings, and firms like Colt's Manufacturing and Phoenix Arms have moved down. Others have been knocked out of the rankings altogether, for example, Lorcin and Davies Industries. Both were essentially sued

out of business. Paul J. Jimenez replaced one of them by buying its assets and moving operations from California to Nevada. It is suspected, but not confirmed, that Cobra Enterprises similarly originates from a bankrupt or otherwise closed California firm with assets moved to Utah. United States firearms manufacturers are, for the most part, small-scale and privately owned. It is exceedingly difficult to come by reliable information, but we have been able to establish that, in Figure 2, Beemiller, Haskell, and Iberia all are cross-linked in their ownership and/or distribution channel (MKS Supply), effectively functioning as a single firm. The rankings based on the BATF data (which report on legally separate entities) are therefore misleading. Ownership patterns are in fact very hard to work out. Only in late 2007, for example, did the long-suspected link between Kahr Arms (the brand name) and Saeilo, Inc. (the formal owner) become clear.⁵

Volatility in the market appears to have come to a head in 2007 with several spectacular merger and acquisition deals taking place. Thus, Cerberus Capital Management, LP — the firm that bought out Chrysler from Chrysler-Daimler — acquired Remington Arms of Madison, NC. It also bought Bushmaster Firearms of Windham, ME, and DPMS Panther Arms of St. Cloud, MN, both makers of AR15/M16 rifles. Bushmaster, in turn, acquired Cobb Manufacturing of Dallas, GA, and formed a joint venture with Iron Brigade Armory, Ltd., of Jacksonville, NC. Remington, in turn, acquired Marlin Firearms of North Haven, CT, and Gardner, ME. Both Remington and Marlin own a number of brand names (from earlier acquisitions), of which H&R 1871, LLC, is especially notable. Whereas Remington and Marlin produce mainly civilian longguns, Bushmaster and DPMS produce mainly military-style rifles. Given the 2006 BATF unit production numbers, Cerberus would now appear to control about half of the U.S. civilian and law enforcement rifle market, and it may be positioning itself to break into the U.S. military M16 contracts, currently held by Colt's Defense and FN Herstal (of Belgium).

Based on the production numbers, Figure 3 lists the rankings from 1998 to 2006. The two entries for Bushmaster in 2006 occur because during the year, ownership changed, making a separate FFL, and hence a separate data record, necessary. In any event, Cerberus now controls six of the top-20 firms and its subsidiaries and brands (highlighted in bold).

In Figures 2 and 3, note the position of Sturm Ruger & Co. From its consistent number one spot, it has now been displaced. Ruger (the industry shorthand for the firm) is of especial interest because it is the *only* U.S. handgun/longgun manufacturer with consistent public (that is, public shareholder) ownership and therefore required by law to file certain reports on its financial and market condition with the United States Securities and Exchange Commission (SEC). The shares of other firearms makers have been publicly traded from time to time, but never consistently, and Cerberus' recent acquisitions have taken more of the few private. The records for Ruger thus

afford a unique, if limited, view into the innards of the industry.

To our knowledge, this is the first time in the defense, security, peace, and conflict literatures that a financial analysis of a major firm in the small arms and light weapons product category has been carried out. Two research observations may be noted up-front. If Ruger may be considered to offer a complete financial data “base line” for 1994-2007, one research task would be to obtain similar financial performance indicators for the few other firms that, at one time or another, were also publicly traded. Even if coverage may be spotty, an informative industry-level pattern might nonetheless emerge. Second, even though Ruger products generally are not implicated in the flagrant firearms abuse haunting developing countries, simply “anchoring” the firearms industry by the Ruger records is a crucial first step in better understanding the industry per se. The financial filings on which we have based our analysis contain much more information than we are able to present here, and they can enable researchers to ask probing questions of other firearms manufactures.

The specific objective of the current paper is to learn to what extent we can confirm the general market and profit pressure trends first identified in Hall, Markowski, and Brauer (2008).

Methodology

To achieve the stated purposes, Sturm Ruger & Company, Inc.’s legally mandated annual 10-K filings on the SEC’s EDGAR database were used to obtain financial data and related information for the firm. The firm’s annual filings from 1995 to 2007 are available in the database, and financial statements go back to 1994 in these filings.

The financial analysis of the firm is conducted by using standard, or at any rate, frequently used financial analysis measures at the firm level. These include measures pertaining to (1) company growth, (2) investment, (3) liquidity, (4) financial leverage, (5) asset management, (6) profitability, (7) risk of bankruptcy, and (8) market value. These measures, and how they are calculated, are tabulated in Table A1. For all measures, both changes from the beginning to the end of the period and median values are computed (trend and point analysis). Median values are chosen because of their relative robustness to outliers. Graphical presentation of annual measure values are used to observe trends.

Results



Figure 4: Real sales and GDP growth (%), 1994-2007.

Growth analysis

Financial performance indicators comprise measures such as growth in sales, assets, profit, and equity, and the relationships between and among them. For example, growth in sales generally is found to increase profitability (Capon, Farley, and Hoenig, 1990, pp. 1144, 1156).

Sales growth: Changes in sales are important, especially when sales fall. When growth rates in sales are positive and high, this is considered good. But,

conversely, even though declines in sales can be taken as a sign of possible management problems, not all sales declines are attributable to management. Some may be due to a downturn in the economy-wide business cycle. Ruger's sales declined in real terms from \$218 million in 1994 to \$130 million in 2007 (an annual median growth rate of -4.14).

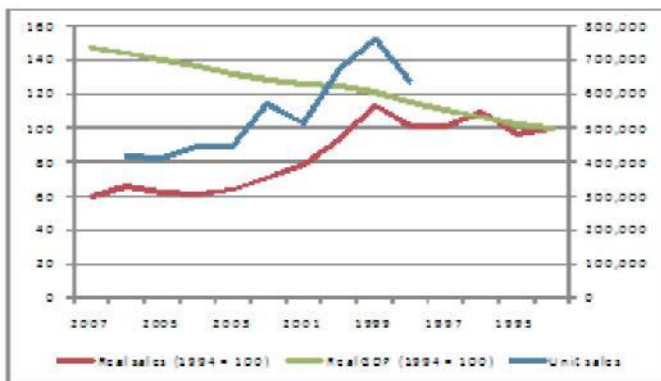
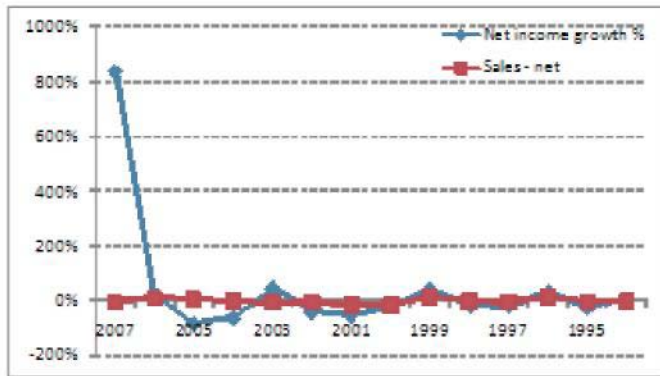


Figure 5: Real sales, GDP (1994=100); unit sales; 1994-2007.

Figure 4 compares the firm's real sales



growth with the economy's real GDP growth. Sales growth suffered significantly in the early 2000s, preceded the short U.S. recession of 2001, and stayed negative throughout the slow economy recovery. Figure 5 makes this more explicit by indexing Ruger's real sales and

Figure 6: Net income and sales growth (%), 1994-2007. U.S. real GDP to 100 in 1994 (note the divergent fortunes) and by listing Ruger's unit sales on the right-hand axis.⁶ For the past 10 years, Ruger has obviously been struggling. The real sales decline in 2007 is due, in part, to the cessation of operations in titanium casting (Sturm Ruger & Company, Inc., 2007:4), the result of shedding an unviable business segment.

Net income growth: A firm's capital providers are interested in net cash flow. Net cash flow can be used by management to pay dividends, repurchase shares, pay off some or all of the firm's debt, or make capital (current and noncurrent) investments. Net cash flow is composed of net income minus noncash revenues plus noncash charges, and the relation between net income and net cash flow might be a reason why a firm's stock and bondholders consider an increase in net income a good thing. Ruger's net income declined by 69.7% from 1994 to 2007, and the median annual growth rate over the period was -16.0%. The decline in sales can partly explain the significant decline in net income. The remainder is attributed to an increase in expenditure, as shown in the profit analysis later in this paper.

It can also be asked if sales growth did more harm than good to profit. Figure 6 shows annual growth rates of both sales and net income over the period. Ruger's annual net income growth rates were higher than those of sales (for 1994, 1996, 1999, 2003, and 2006). 1998 and 2005 were the only years in which sales increased, but net income decreased. In 2007, sales decreased, but net income increased tremendously. This unusual increase in net income can be explained by both a decline in the firm's expenses and an increase in revenue generating sources other than sales, support for which is also provided in the profit analysis section.

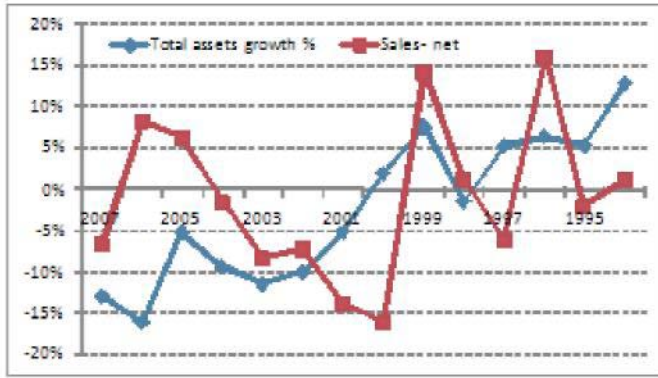


Figure 7: Total asset and net sales growth (%), 1994-2007.

Asset growth: Assets are a firm’s source to produce profits. Increases in assets are desirable only if they are used efficiently, producing sales and profit. Otherwise the cost of funds used for asset growth harms the business. Asset decline works on the same principle of not hurting efficiency and profitability. Therefore, asset growth should

be proportional to those of sales and profit.

Ruger’s assets declined around 40% for 2007 as compared to 1994. For now ignoring net sales, Figure 7 shows an

increasing trend in assets until 2001. When times were good (between 1994 and 1999), the firm made major fixed asset investments and increased inventories. But bad times apparently caused the firm to delay fixed asset investments and to decrease inventories in 2001 and beyond (see Johnson, 1999, pp. 55-56).



Figure 8: Capital expenditure ('000), 1994-2007.

The role of capital expenditure (investment in buildings and/or modernizing facilities and equipment) in the assets decline can be seen in Figure 8. The firm’s capital spending was high in the early years of the period, but then were low; in 2003 and 2007, Ruger even sold some of its unused assets (hence the negative amounts). The firm completed building

new facilities by 1998 and improved equipment in 1998, 1999, and 2000.

When growth in assets is compared with growth in sales, as in Figure 7 (previous page), it should be noted that in good times when the firm made major capital investments, sales did not increase steadily. In addition, after the bad years the firm kept lowering its assets while also undertaking some capital spending in recent years, and except for the decline in 2007 these efforts resulted in a rebound in sales. This might be explained by an increase in efficiency, a hypothesis supported in the asset management section later in the paper.

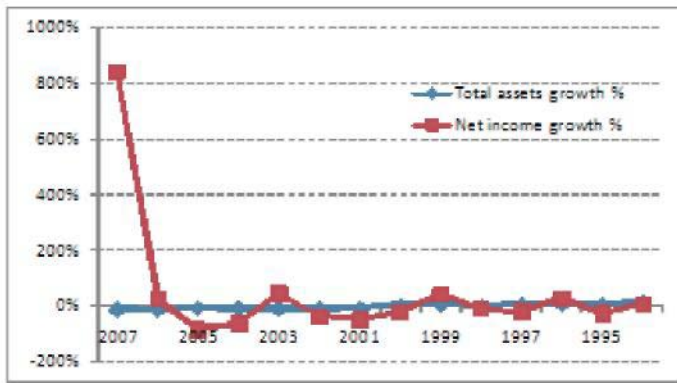


Figure 9: Asset and net income growth (%), 1994-2007.

The growth in assets is compared with the growth in net income in Figure 9. Until 2001, in 1994, 1996, and 1999, an increase in assets was accompanied by an increase in net income. These are also the years in which sales increased. So the increase in assets appears to have resulted in net income increases when sales increased.

This shows the firm's dependence on efficiency rather than returns on sales in that period. Support for this is provided in the DuPont analysis conducted later on. Since 2001, a continued decline in assets has occurred, but in four out of seven years net income has also declined. It seems that the economic downturn of the 2000s adversely affected Ruger's sales and profit, and the firm could only manage through cost reduction and/or efficiency increases in the last two years of the time period. This thesis is supported by the results presented in the asset management and DuPont analyses later.

Liabilities and equity growth: Liabilities represent the money the firm owes; stockholders' equity (net worth) represents owners' share of the assets. When liabilities' weight in total liabilities and shareholders' equity increases, the firm's financial risk level increases, and vice versa. Therefore, risk of financial failure of a business depends on the liability/equity proportions (Foster, 1986, p. 551).

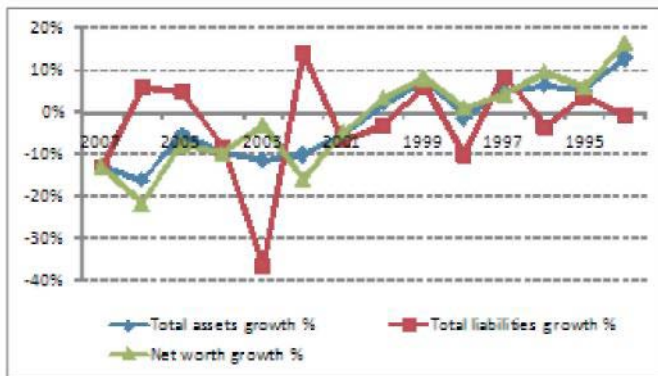


Figure 10: Assets, liabilities, and net worth growth (%), 1994-2007.

Ruger's liabilities and stockholders' equity were lower (40.2% and 39.8%, respectively) in 2007 than they were in 1994. As Figure 10 illustrates, until 2001, the firm experienced both increases and decreases in liabilities while net worth grew steadily (albeit it at declining rates). Also in this period, assets followed an increasing trend. Since 2001, steep increases and decreases in liabilities took place, with net worth was constantly declining. Assets in this time period were declining, too. The result of these developments was a return to the financial risk level of 1994 (see leverage analysis later in the paper).

Investment

Financial resources can be distributed among capital investments, labor, and R&D. The distribution to capital and labor is called capital intensity, and the higher it is, the lower is profitability (Berman, Wicks, Kotha, Jones, 1999, p. 499). As for R&D, there is a suggestion in the literature that research intensity and patents are positively related to sales growth (Del Monte and Papagni, 2003, pp. 1004-1005) and to profitability (Capon, *et al.*, 1990, p. 1156).

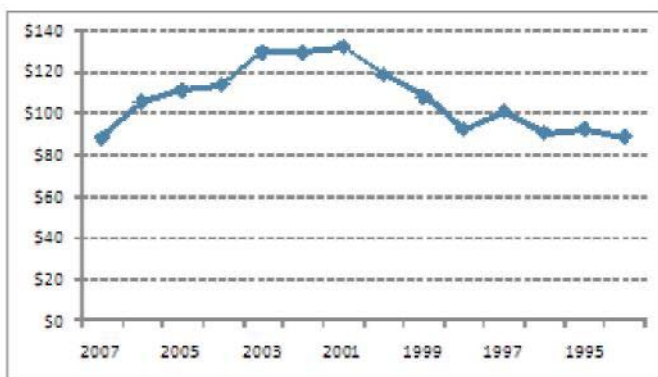


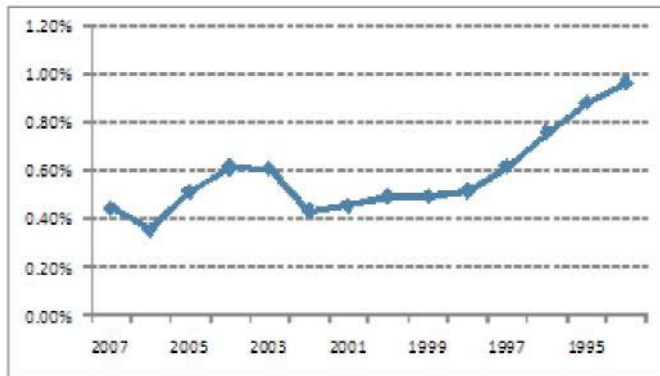
Figure 11: Capital intensity (\$'000), 1994-2007.

Capital intensity: Ruger's capital intensity declined by 0.8% between 1994 and 2007, and the median figure was \$107,000. Figure 11 illustrates that the firm's capital intensity was low until 1998, then followed an increasing trend up to 2001 and declined as from 2003. The highest levels of capital intensity occurred between 2001 and 2003 when the firm was

experiencing the adverse effects of the economic downturn and made cost saving efforts on labor when the firm's assets were high. The declining trend in recent years brought the firm back to the low capital intensity level of 1994. This is an indication of significant cost savings on employees.

R&D intensity: Ruger's R&D intensity for 2007 declined 53.8% from 1994, and the median R&D intensity was 0.5%. As seen in Figure 12, R&D intensity was high in the early years of the

period, then it steadily declined until reaching rather high levels in 2003 and 2004. There was a marginal increase in 2007. Low R&D intensity suggests slowed new product introductions, therefore reduced growth in sales and profit. This is consistent with the sales growth results observed earlier and at least partially consistent with the profit growth analysis presented in the sales and income growth analysis section.



Liquidity analysis

Liquidity measures allow one to assess a firm’s ability to meet its short-term obligations. Liquid assets are needed to meet current obligations of the firm. Thus, high liquidity is valued as far as financial failure risk is concerned, but not as far as revenues and profits are concerned.

Figure 12: R&D intensity (R&D as percentage of sales), 1994-2007

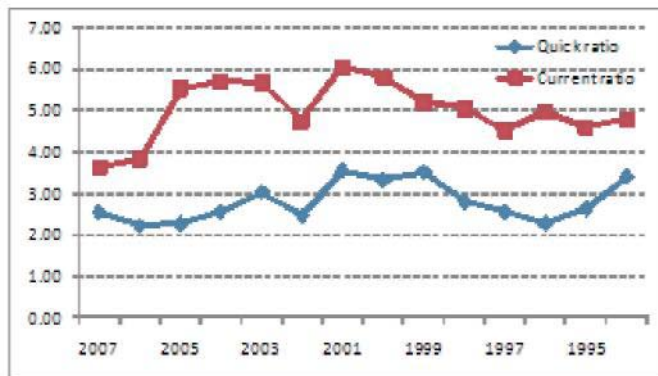
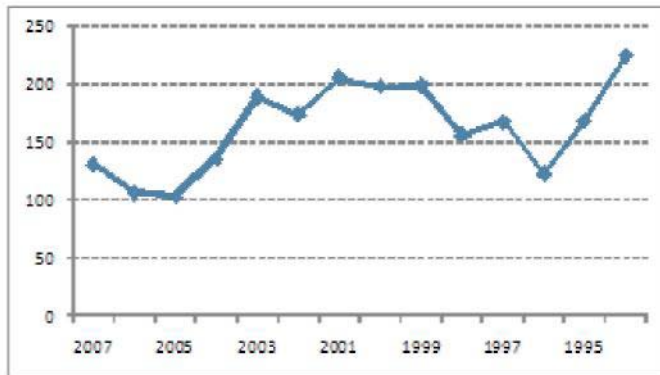


Figure 13: Current and quick ratios, 1994-2007.

Current ratio: The rule of thumb for the current ratio (that is, current assets over current liability) is 2:1. Ruger’s median current ratio was 5 over the period and decreased by 24.3% for 2007 when compared to 1994. Current ratios, depicted in Figure 13, were higher between 2000 and

2005 (except 2002) than they were in the rest of the period. The lowest current ratio (3.6) occurred in 2007, but even that was above the rule of thumb. Thus, the firm’s ability to meet its current obligations was high. Quick ratio: Since inventories are the least liquid part of current assets, the ability to meet short-term obligations without having to sell-off inventories is also used for liquidity assessment. The rule of thumb for the quick ratio is 1.5:1. Declining by 25.8% between 1994 and 2007, the median annual quick ratio was 2.6. The highest ratios occurred in 1994 and during 1999-2001 while the lowest occurred in 1996 and 2002.



Quick ratios were always above the rule of thumb so that the firm's short-term liquidity was high over the period. The gap between the quick and current ratios narrowed in 2006 and 2007 suggesting a reduced share of inventories in current assets. The firm also had excess and obsolete inventory, though.

Figure 14: Defensive interval (in days), 1994-2007.

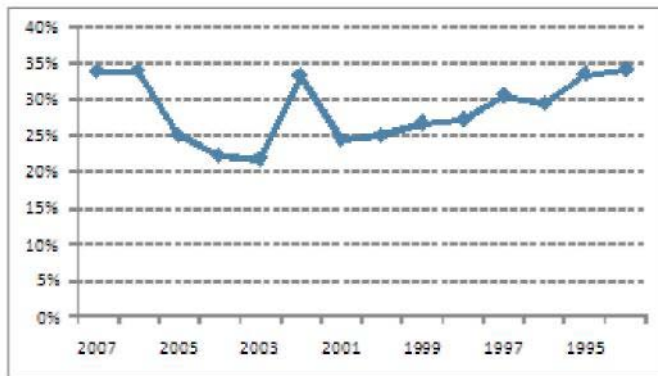
Defensive interval: The

defensive

interval is the most conservative liquidity indicator and measures a firm's capacity to keep operating at current levels without generating new resources (White, Sondhi, and Fried, 1998, p. 160). Ruger's defensive interval for 2007 declined 41.8% from 1994. The median was about 168 days over the period. As seen in Figure 14, there was a decline in days of expenditure covered in the beginning of the period, due to increased expenditure, but the decline in the second half of the period might be due to improved operating performance, a contention supported by the results of the asset management analysis provided later on. High levels of defensive intervals between 1999 and 2001 can be explained by the economic downturn.

Financial leverage analysis

Financial leverage refers to the extent to which a firm relies on external funds rather than funds provided by owners. As mentioned in the liabilities and equity growth section, the more debt a firm uses, the more risk of financial failure it carries. But because debt financing can have a tax-shield effect leverage may be desirable. Thus, the bottom line of debt financing is that financial leverage cannot benefit the firm when the rate of return on assets is lower than the cost of debt, and the use of debt in total financing is low (Ross, Westerfield, and Jaffe, 1996, p. 37).



Ruger's debt to equity ratio for 2007 remained stable relative to 1994, and the median annual debt to equity ratio was 30% during the period. Figure 15 shows a declining trend until 2001, a jump in 2002, and then an increasing trend since then,

stabilizing in 2007. Ruger's increased debt

Figure 15: Debt to equity ratio, 1994-2007.

of the payables.

to equity ratio in the last two years period is due to loosened terms of trade

An interesting note related to leverage is that in the entire study period Ruger has *never* financed itself externally, or had significant lease obligations. Right before the end of 2007, it entered into a line of credit agreement whose maturity is one year, but Ruger made no use of it (Sturm Ruger & Company, Inc., 2007, p. 59). Covenants attached to debt agreements are restrictive on some ratios, one of which is most likely the debt to equity ratio. The reason for going for short-term external financing might be concerns over cash shortages, probably the result of changes in asset management (operational) policies, support for which is provided in the following section.

Asset management analysis

Asset management indicators serve to understand how effectively various assets are utilized in the business. Low asset management measures indicate problems in the firm's operations and are related to low performance measures.

Receivables in days: A low collection period is favorable as this indicates efficiency of the firm in selling its products. But when it is too low, it may instead imply curtailment in sales and adversely affected profits. Conversely, a long collection period also is not desirable because of possible liquidity problems.

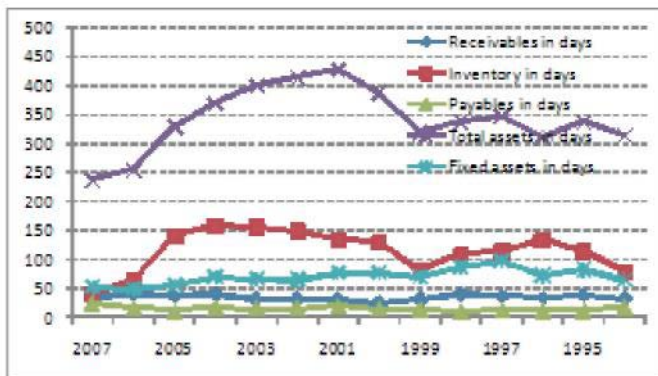


Figure 16: Activity efficiency measures, 1994-2007.

their drop to the lower levels in 1999. These shorter collection period years correspond with the years of recession, 2000 to 2003, except 1999. After 2004, the firm allowed its collection period to reach up to 50 days in 2006.

Inventory in days: Inventory in days declined by 47.5% between 1994 and 2007, and its median value was 122 days. The improvement in inventory management measures happened in recent years, probably as the result of declining gross inventories in the last two years, 2006 and 2007, and the adjustment to a new production policy, the “customer-demand pull system,” at the end of 2006 (Sturm Ruger & Company, Inc., 2006, p. 22). Decreasing inventory levels and the adoption of new order and production systems show the firm’s efforts to free up cash from inventory investments and also to reduce inventory carrying costs. However, the firm may need to have quick access to a cash resource (for instance, a bank credit) in order to support the reduced holding period of inventory.

Payables in days: The measure of payables in days shows the payment habits of the firm. The longer the payment period, the better cash can be used for productive operations. But if the period is too long, it may indicate a cash shortage. Payables in days increased by 42.7% between 1994 and 2007, and their median value was 14.5 days. With the exception of 2005, they were generally higher in the 2000s than in the late 1990s. 25 days of payables in 2007 was the highest for the whole period. Creditors seem to have loosened credit terms since 2000, probably indicating the firm’s improved operating performance. When payables in days and receivables in days are compared, it appears that the firm collected from its customers later than it paid its suppliers. But gap between them became shorter during the economic slowdown in the early 2000s.

Fixed assets in days: Fixed assets in days captures the usefulness of fixed assets to the firm. Too short or too long, *net* fixed assets in days suggests caution as the former may indicate old fixed assets, and the latter may indicate useless fixed assets. A second measure, *gross* fixed assets in days, is a better indicator of the usefulness of fixed assets than net fixed assets in days.

Ruger's net fixed assets in days declined by 21.5% between 1994 and 2007. The median fixed assets in days was about 70 days. Figure 16 shows that net fixed assets in days had a declining trend since 1997. This trend may reflect that the firm's fixed assets are not new and sales have been decreasing. As for the vintage of Ruger's fixed assets, Figure 8 showed its major capital investments were made between 1994 and 1997.

White, Sondhi, and Fried (1998, p. 153) state that a better measure of efficiency in fixed assets is gross fixed assets in days. This measure eliminates the effect of accumulated depreciation. This indicator increased in 2007 by about 67% compared to 1994, and the median figure was about 276 days. The gross fixed assets in days as seen in Figure 16 have had an increasing trend until 2004, and then a declining trend except for the marginal increase in 2007. These observations suggest a trend of decreasing efficiency up to 2004 and, thereafter, an increasing one, except for the marginal decrease in 2007. The increase in fixed asset efficiency is the result of both the increase in sales and the sale and impairment of some of the fixed assets.

Assets in days: Assets in days show the efficiency in both current and noncurrent assets management and play a role in the profitability of assets. An examination of this measure may reveal unduly low or high asset investment, either of which is a sign of potential profitability trouble.

Ruger's assets in days declined by 24.5% in 2007 compared to 1994, and the median assets in days was about 339 days between 1994 and 2007. Assets in days stayed relatively stable until 1999. After that, the firm showed an increasing trend until 2001, but then a declining trend in the following 6 years. At first, the declining trend was due to declining investments in both current and noncurrent assets. But after 2004 the aforementioned improved efficiency in fixed assets kicked in, and also the adoption of the policy of producing no more than customer demand paid off in the much lower inventory investment in 2006 and 2007 and in improved productivity in 2007 which also helped to improve asset efficiency. As stated previously, quick access to a cash resource may be required due to increased asset efficiency.

Profitability analysis

Profitability is the end result of liquidity, asset management, and leverage; therefore it is a performance measure. High profitability represents high performance, and vice versa. And profits are needed to grow, or even to survive. But even high profitability does not eliminate the risk of financial failure as it is cash flow that counts. Profitability can be measured either by its relationship to sales or to the investment used to produce profit.

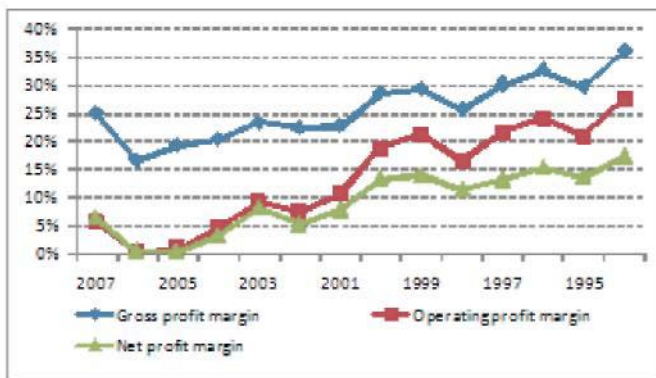


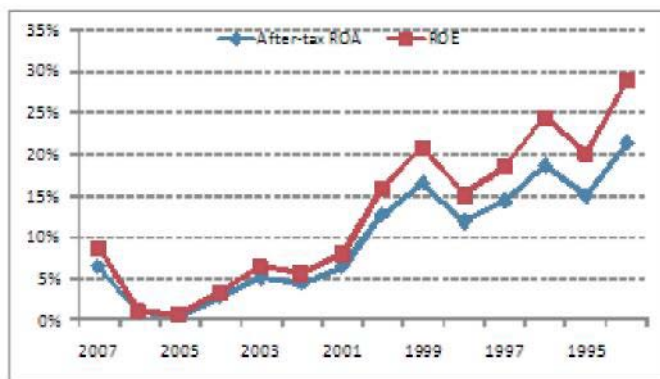
Figure 17: Profit margins, 1994-2007.

over the period before improving in 2007. A strong drop in this indicator occurred in 2001, and continued even further until it reached its lowest level (16.7%) of the entire period in 2006. The decreasing trend since 2001 indicates that the firm's efficiency in producing its products has been declining. When the effect of inventory reduction (lifo liquidation) is taken out, there was an improvement in gross profit margin in 2007, a sign of cost savings. Cost savings might be due to productivity increases that probably took place with the move to the new production system mentioned previously.

Operating profit margin: The operating profit margin measures a firm's profitability from its core activities. For Ruger, this measure declined by around 79% between 1994 and 2007. The median annual operating profit margin was 13.8%. This performance indicator followed a similar over trend as the gross profit margin over the period, but with a more pronounced decline since 2001. The rising gap between gross and operating profit margins reflects continued reduced efficiency in operations other than production. Despite efforts to reduce administrative costs through employee buyouts (Soule, 2006, p. 2), the increasing trend in general and administrative costs is noticeable.

Net profit margin: Net profit margin is an indicator of the firm's profitability after all expenses. It declined from 17.3% in 1994 to 6.6% in 2007. The declining trend in net profits is noticeable in Figure 17. The gap between operating and net profit margins declined steadily, and vanished during the last 3 years of the study period. This was due to declining income from short-term investments, despite the sale of unused assets in recent years.

DuPont analysis: Profit is generated by the use of assets, and capital providers for these assets — shareholders and creditors — are interested in profitability in relation to the assets and to their equity investments. The DuPont analysis breaks down return on equity, the return received by the shareholders, to understand sources of strength and weakness in a firm's performance. The return on equity is first disaggregated into two components, return on assets and financial leverage. The former is then broken down into a further two components, net profit margin and asset turnover. The reason behind high asset profitability could be high stockholder profitability on sales, high turnover, or a combination of these two (White, Sondhi, and Fried, 1998, p. 183).



A DuPont analysis for Ruger reveals that the firm's return on assets and return on equity in 1994 were 69.4% and 69.9% higher, respectively, when compared to 2007. Figure 18 shows significant declines in both of the profitability indicators. The margin between the return on equity and the return on assets also had a declining trend

Figure 18: Return on assets and equity, 1994-2007.

over the years, except for 2007. This was because of the steadily declining leverage.

The two components of the return on equity — net profit margin and financial leverage — declined by 73.7% and 1.60%, respectively, during the period. The third component, asset turnover, increased by 16.3%, but this success in asset management could not overcome the serious decline in net profit margin, which in turn caused the serious deterioration of 70% in the return on equity.

Figure 17 illustrates annual net profit margins over the 1994 to 2007 period. The net profit margin declined over the period, although with an increase in 2007. So did the returns on assets and equity, as seen in Figure 18. Significant improvement in asset management (asset turnover) since 2001 is noticeable in Figure 19. Also, the figure suggests that the firm did not prefer using financial leverage to increase its return on equity, but there is marginal increase in leverage since

2004.

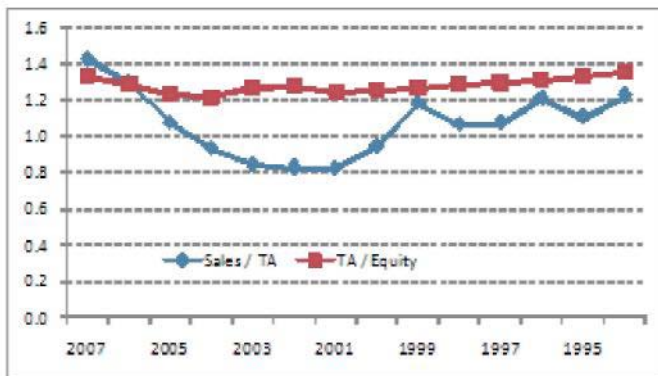


Figure 19: Asset turnover and equity multiplier, 1994-2007.

Ruger’s performance weakness in the entire period is the declining net profit margin, solutions for which include elevating sales prices, introducing new products with higher profit margins, or going for cost savings. Price increase may not be viable as the firm states price as one of its means to compete (Sturm Ruger & Company, Inc., 2007, p. 8). Therefore, cost control and/or innovation are the viable options.

However, the firm has followed the path of efficiency increases in asset utilization instead of working on its sales profitability. The recent improvement in profitability in 2007, though, shows efforts to control production-related costs, too. The continued loss of high returns to assets and equity during the study period suggests steep competition in the industry in addition to sensitivity to the economic downturn of the early 2000s.

Bankruptcy analysis

The riskiness of a firm is assessed by something called a Z-score. It indicates the likelihood that a publicly traded firm may go bankrupt (Altman, 1968, p. 609). Scores less than or equal to 1.81 indicate high bankruptcy risk while scores greater than or equal to 2.99 indicate low risk (Kaplinski, 2008, p. 23).

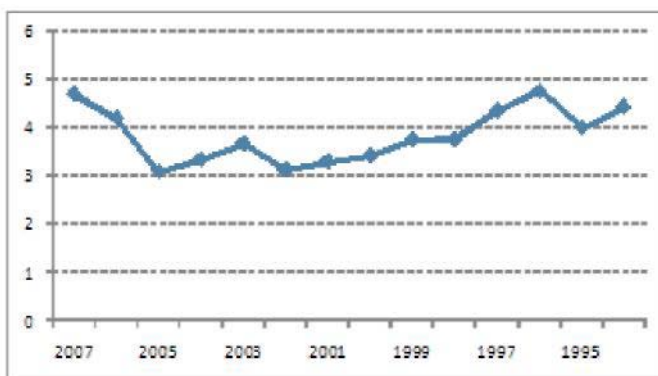


Figure 20: Z-scores, 1994-2007.

Ruger’ Z-score increased by about 6% between 1994 and 2007, and the median Z-score was 3.8. Figure 20 demonstrates that in the beginning of the period nonbankruptcy risk was high (around 4), but then it followed a steady decline until it first reached 3.15 in 2002, and then 3.07 in 2005. The last two years’s Z-scores showed

significant improvement carrying the firm back to scores of around 4. The declining trend was in line with the firm’s declining ability to deal with enhanced competition as suggested by its declining asset efficiency. The declining risk in the last two years

is consistent with improvements in efficiency and profitability.

Market value analysis

Stock provides market value information that cannot be reached in financial statements. The stock price is used to get a multiple to obtain information about the market demand for the stock. The higher the multiple, the more confident are investors are about the firm's growth prospects.

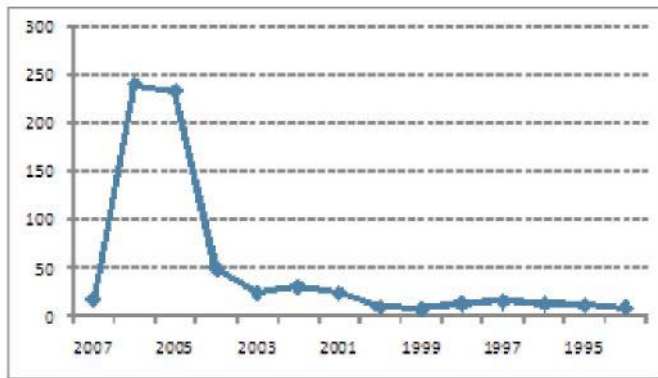


Figure 21: Price/earnings multiples, 1994-2007.

from 8.4 in 1994 to 18 in 2007, and the median multiple was 16.7. As seen in Figure 21, Ruger's price/earnings multiple increased, beginning in 2001, and jumped to very high levels in 2005 and 2006, in which the earnings of the firm significantly deteriorated. In 2007 it returned to around its historical norm (16.7). The jump may indicate investors' confidence in the firm's earnings potential, especially following the terror attacks on 11 September 2001.

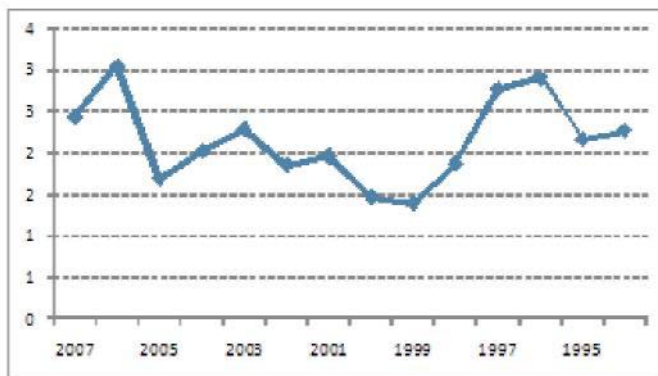


Figure 22: Price/book value multiples, 1994-2007.

mostly due to its advantages over the price to earnings multiple (Stowe, Robinson, Pinto, and McLeavey, 2002, p. 207). The higher the price to book value multiple, the higher the confidence toward book value growth.

For Ruger, the price/book value multiple increased by 7.4% between 1994 and 2007, and the median multiple was 2.1. Annual multiples are presented in Figure 22. They were relatively low between 1998 and 2005. The low price to book value multiple implies low expected equity profitability (Reilly and Brown, 1997, p. 737), which is consistent with the relatively

low default risk during this period (see Figure 20), as Vassalou and Xing argue that the multiple reflects the default risk of the firm (2004, p. 866).

Conclusion

Using the financial data of Ruger, this paper conducts a financial analysis of the firm between 1994 and 2007. The analysis suggests the following general conclusions: (1) the firm's sales were somewhat sensitive to the business cycle downturn of the early 2000s, but mostly to competitive pressure; (2) the firm has been decreasing its assets over time; (3) capital intensity was highest during economic downturn, declining since then, and R&D intensity has been declining from its highest levels of the mid-1990s; (4) financial leverage was high in the beginning and ending years of the period; (5) liquidity of the firm was high over the entire period; (6) asset utilization efficiency improved recently, and is mostly attributable to better inventory and fixed asset management policies; (7) the firm's profitability has generally been declining, albeit with an improvement in 2007, and the declining trend was due to deteriorating profit from sales despite the improvement in asset efficiency; (8) the firm is nonbankrupt, and its bankruptcy risk has decreased recently on account of enhanced performance in efficiency and productivity; and (9) investors' earnings growth expectations significantly increased recently, as did their book value growth expectations.

These findings suggest that Ruger was affected by the business cycle in the early 2000s, and thereafter had difficulty in coping with competition. High profit margins were lost due to increased production and operation costs. The firm has been reducing its asset base to improve efficiency, but the efficiency increase came only recently and was not enough to stop declining profits to stockholders. Low profitability does not bring new funds to the business through stockholders. The effort to leave the unviable titanium casting business operations helped profitability in 2007. These recent developments helped to reduce Ruger's bankruptcy risk and improve its stock performance.

Ruger's new policies aimed at increasing both efficiency and productivity have not been completed yet (Sturm Ruger & Company, Inc., 2007, p. 24). A further lowering of the asset base, including shedding unviable operations, may help the firm to improve its performance as reduced diversification can be a factor in improving performance (Capon, *et al.*, 1990, p. 1156). In addition, even though cost savings are needed, the firm's commitment to R&D should be enhanced and maintained for future viability as new products replace those that are in the declining stage of their life cycles.

In light of Ruger's overall standing in the U.S. firearms industry — a full-line manufacturer of pistols, revolvers, rifles, and shotguns, with a long-running record as the number 1 unit producer in each category — it is somewhat astonishing to learn how much

even this firm has and is struggling to survive. Its SEC filings routinely mention import competition as a risk factor and also the significant financial resources its main competitors can bring to bear on the market if they so choose. Cerberus Capital Management, LP, recent acquisitions in the longgun market may be a sign of a significant fight for market share and profitability shaping up in the years to come.

Notes

1. For documentation, see the annual *Small Arms Survey* (Geneva: Small Arms Survey Project and Cambridge: Cambridge University Press).
2. See Hall, Markowski, Brauer (2008).
3. BATF was a division of the U.S. Treasury, a reflection of its creation as a tax agency, collecting taxes on firearms and ammunition trade. After the terror attacks on the United States on 11 September 2001, the Bureau was renamed and folded into the newly created U.S. Department of Homeland Security. BATF collect data on unit produced and sold in a given year (that is, excluding production into new inventory but including production sold out of old inventory) to civilian and law enforcement markets. Military production and sales are not reported. While all firearms manufacturers in the United States need to be in possession of a valid Federal Firearms License (FFL), reporting of unit production is essentially voluntary; there are no apparent penalties for nonreporting or for incorrect reporting. On occasion, the Annual Firearms Manufacturing and Export Report (AFMER) will specifically mention the percent of reporting firms, e.g., 79% of manufacturing FFL holders in 2005. Sometimes very large, prominent firms — for example, Marlin Firearms in 2005 — will not report, and therefore skew the data. Nonetheless, we believe that the general trend shown in Figure 1 properly reflects the U.S. civilian and law enforcement firearms market.
4. U.S. Customs Service import/export data are available (see, e.g., Gabelnick, Haug, and Lumpe, 2006, Tables 12 and 13, pp. 50-51). While data on civilian imports/exports are deemed usable, in an interview, a 30-year veteran industry analyst at a relevant government office strongly counsels against use of the military gun data in analytic work.
5. This has been of importance to some observers, in that the original financier behind Saeilo is the Rev. Sun Myung Moon, the founder of the Unification Church. Kahr Arms was founded, and is still run, by one of his sons — Kook Jin (Justin) Moon — who in interviews consistently averts questions regarding the involvement of the church in the business (see, e.g, Stewart, 2007).
6. Unit production and sales from BATF's AFMER reports, 1998-2006. This combines Ruger's pistol, revolver, rifle, and shotgun manufacturing.

References

- Altman, E. I. 1968. "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy." *The Journal of Finance* 23(4):589-609. [BATF] Bureau of Alcohol, Tobacco, and Firearms. Various years. *Annual Firearms Manufacturing and Export Report*. Washington, D.C.: U.S. Department of Homeland Security. Bureau of Alcohol, Tobacco, Firearms, and Explosives.
- Berman, S. L., A.C. Wicks, S. Kotha, and T.M. Jones. 1999. "Does Stakeholder Orientation Matter? The Relationship between Stakeholder Management Models and Firm Financial Performance." *The Academy of Management Journal* 42(5):488-506. Special Research Forum on Stakeholders, Social Responsibility, and Performance.
- Capon, N., J.U. Farley, and S. Hoenig. 1990. "Determinants of Financial Performance: A Meta Analysis." *Management Science* 36(10):1143-1159.
- Del Monte, A. and E. Papagni. 2003. "R&D and the Growth of Firms: Empirical Analysis of a Panel of Italian Firms." *Research Policy*, 32:1003-1014.
- Foster, G. 1986. *Financial Statement Analysis*. 2ed. Englewood Cliffs, NJ: Prentice Hall. Gabelnick,
- T., M. Haug, and L. Lumpe. 2006. "A Guide to the U.S. Small Arms Market, Industry and Exports, 1998-2004." Occasional Paper 19. Geneva: Small Arms Survey.
- Hall, P., S. Markowski, and J. Brauer. "The U.S. Small Arms Industry: Profit, Proliferation, Performance." *Asteriskos: Journal of International and Peace Studies*, Nos. 5/6, pp. 41-62.
- Johnson, M. F. 1999. "Business Cycles and the Relation between Security Returns and Earnings." *Review of Accounting Studies*, 4:93-117.
- Kaplinski, O. 2008. "Usefulness and Credibility of Scoring Methods in Construction Industry." *Journal of Civil Engineering and Management* 14(1):21-28.
- Reilly, F.K. and K.C. Brown. 1997. *Investment Analysis and Portfolio Management*. 5ed. Fort

Worth, TX: Dryden.

Ross, S.A., R.W. Westerfield, and J. Jaffe. 1996. *Corporate Finance*. 4ed. New York: Irwin.

Small Arms Survey. Various years. *Small Arms Survey*. Cambridge: Cambridge University Press.

Soule, A. 2006. "Ruger Aims to Thin Ranks." *Fairfield County Business Journal*, 45(52): Cover story (25 December 2006). Stewart, C.S. 2007. "Money, Guns & God." Portfolio.com. October 2007 issue <http://www.portfolio.com/careers/features/2007/09/17/Unification-Church> [accessed 18 Sept 2007].

Stowe, J.D., T.R. Robinson, J.E. Pinto, and D.W. McLeavey. 2002. *Analysis of Equity Investments: Valuation*. Charlottesville, VA: Association for Investment Management and Research.

Sturm Ruger & Company, Inc. 2006. Securities and Exchange Commission Form 10-K.

Sturm Ruger & Company, Inc. 2007. Securities and Exchange Commission Form 10-K.

Vassalou, M. and Y. Xing. 2004. "Default Risk in Equity Returns." *The Journal of Finance* 59(2):831-868.

White, G.I., A.C. Sondhi, and D. Fried. 1998. *The Analysis and Use of Financial Statements*. 2ed. New York: Wiley.

Appendix. Table A1: Financial Analysis of Sturm Ruger & Co., Inc.

Measure	Ratio/multiple	Formula	Change (1994-2007)	Median	
Growth	Sales-net growth %	$(\text{Sales}_2 - \text{Sales}_1) / \text{Sales}_1$	-20.3%	- 1.8%	
	Real sales-net growth %	$(\text{Real Sales}_2 - \text{Real Sales}_1) / \text{Real Sales}_1 +$	5.6%	0.6%	
	Net income growth %	$(\text{Net income}_2 - \text{Net income}_1) / \text{Net income}_1$	-69.7 %	- 16.0%	
	Asset growth %	$(\text{Assets}_2 - \text{Assets}_1) / \text{Assets}_1$	-39.9 %	- 3.3%	
	Liabilities growth %	$(\text{Liabilities}_2 - \text{Liabilities}_1) / \text{Liabilities}_1$	-40.2 %	- 2.0%	
	Stockholders' equity growth %	$(\text{Stockholders' equity}_2 - \text{Stockholders' equity}_1) / \text{Stockholders' equity}_1$	-39.8 %	- 1.0%	
Investment	Capital intensity	Total assets/Number of employees	-0.8%	\$107,000	
	R&D intensity	R&D expenditures/Sales-net	-53.8%	0.5%	
Liquidity	Current ratio	Current assets/current liabilities	-24.3%	5.0	
	Quick ratio	$(\text{Current assets} - \text{Inventory} - \text{net}) / \text{Current liabilities}$	-25.8%	2.6	
	Defensive interval	$365 * (\text{Cash} + \text{Marketable securities} + \text{Accounts receivables} - \text{net}) / \text{Projected expenditures}^{++}$	-41.8%	168 days	
Financial leverage	Debt to equity ratio	Total liabilities/Tangible net worth	-0.8 %	30%	
Asset management	Receivable in days	Accounts receivable-net/Sales per day \pm	9.7%	35.5 days	
	Inventory in days	Inventory-net/Cost of goods sold per day	-47.5%	115. 122.1 days	
	Payables in days	Accounts payables/Cost of goods sold per day	42.7%	14.5 days	
	Fixed assets-net in days	Fixed assets-net/Sales per day	-21.5%	69.9 days	
	Gross fixed assets in days	Gross fixed assets/Sales per day	66.9%	275.9 days	
	Assets in days	Assets/Sales per day	-24.5%	339.0 days	
Profitability	Gross profit margin	Gross profit/Sales-net	-30.5%	25.4%	
	Operating profit margin	Operating profit/Sales-net	-78.9%	13.8%	
	Net profit margin	Net income/Sales-net	-61.9%	9.9%	
	<u>DuPont system</u>				
	- Asset turnover	Sales-net/Assets-average	16.3%	1.1	
	- Sustainable earning base net profit margin	Sustainable earning base net income \ddagger /Sales-net	-73.7%	9.4%	
	- Return on assets	Sustainable earning base net income/Assets-average	-69.4%	9.2%	
	- Equity multiplier	Assets-average/Equity-average	-1.6%	1.3	
	- Return on equity	$(\text{Sustainable earning base net income} / \text{Sales-net}) (\text{Sales-net} / \text{Assets average})$ $(\text{Assets-average} / \text{Equity-average})$	-69.9%	12.0%	
Bankruptcy	Z-score	$Z = 1(\text{Sales-net}/\text{Assets}) + 1.2(\text{Working capital}/\text{Assets}) + 1.4(\text{Retained earnings}/\text{Assets})$ $+ 3.3(\text{Earnings before interest and taxes}/\text{Assets}) + 0.6(\text{Market value of equity}/\text{Book value of liabilities})$	6.1%	3.8	
Market value	Price to earnings	Price per share/Earnings per share-fully diluted	114.0%	16.7	
	Market to book value	Price per share/Book value per share-fully diluted-fully diluted	7.4%	2.1	

+ Real sales-net is calculated on 1994 CPI.

++ Projected expenditures are estimated by current year expenditures.

\pm Sales per day is calculated as Sales-net/365.

a Cost of goods sold per day is computed as COGS/365.

+++ Inventory reporting method should remain unchanged over the analysis period. Otherwise adjustment should be done to convert one to the other.

\ddagger Sustainable earning base net income is after tax earnings excluding nonrecurring items such as gain on sale of assets.