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The Operating Performance of High Performance Companies during a Period of Financial Crisis: Risks and Opportunities

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Abstract: The global financial crisis of 2007–2009 presented a challenge to all companies around the globe. This study analyzes whether companies that exhibited high performance characteristics in the pre-financial crisis period can maintain their high performance in the post-financial crisis period, and if so, what operating characteristics are most important in managing a company through such a period. The study empirically investigates 1,480 companies in the United States and 22 other countries (MSCI index) over the periods 1998–2007 (benchmark) and 2008–2009 (period of financial crisis) to identify HPC from the former period that exited, maintained, or entered HPC status in the latter period including: (1) the operating characteristics of those companies that were able to sustain high performance from 1998–2007 into 2008–2009; (2) the operating characteristics (performance drivers and performance measures) and associated risk factors which were most critical for companies that exited HPC status in 2008–2009; and (3) the operating characteristics which were most critical for companies that emerged to HPC status in the post-financial crisis period. The results provide direction for management of companies that aspire to HPC status and to maintain HPC status, particularly in times of global financial stress.

Keywords: Strategy, Financial Analysis, Ratio Analysis, Performance Measurement, Financial Crisis

INTRODUCTION

Crises in the world financial markets tend to occur every five to ten years. Since the 1970s, there were crises in 1973, 1983, 1989–1991, 1997–1998, 2000–2001, and 2007–2009.[1]

High performance companies (HPC), those that can sustain exceptional performance over a long period, will inevitably encounter challenging periods. It is therefore critical

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[1] P. Coggan, "Investors hope that history is not repeated: Parallels with the 1973–4 crisis can be over–emphasized," *Financial Times [London (UK)]*, October 10, 2002: 23; Blass, A. A., and R. S. Grossman, "Assessing damages: The 1983 Israeli bank shares crisis," *Contemporary Economic Policy* 19, no. 1 (2001): 49–58; S. Ostry, "The world economy in 1983: Marking time," *Foreign Affairs* 62, no. 003 (1984): 533–560; "1989 Capped decade of failings for nation's financial institutions," *Journal Record [Oklahoma City, Okla]*, January 05, 1990; R. S. Douglas, "Year–End Review of Stock Markets: Investors Expect to See Answers in 1991 – Mideast Crisis, Recession Fears Haunted 1990," *Wall Street Journal*, January 02, 1991: R3; C. S. Poirot, "Financial integration under conditions of chaotic hysteresis: The Russian financial crisis of 1998," *Journal of Post Keynesian Economics* 23, no. 3 (2001): 485–507; Mishra, A. S., and S. Bhattacharya, "The Linkage Between Financial Crisis and Corporate Governance: A Literature Review," *IUP Journal of Corporate Governance* 10, no. 3 (2011): 71–84; Z. Onis, "Beyond the 2001 Financial Crisis: The Political Economy of the New Phase of Neo–Liberal Restructuring in Turkey." (SSRN Working Paper Series, December, 2006);

to understand the key operating variables, associated risks and opportunities that can lead to changes in this elite status. Prior research has shown that these companies represent a small percentage of companies.[2] These studies link strategy, execution and financial performance, and link the key performance objectives to performance drivers and measures in the Financial Performance Scorecard (FPS). Recent studies link the patterns of these operating variables for HPC to specific strategic risks, which can be planned for.[3]

The global financial crisis of 2007–2009 is considered by many economists to be the worst financial crisis since the Great Depression of the 1930s.[4] This period presented a challenge to all companies and opportunities for a few companies around the globe. The present study investigates whether companies that exhibit high performance characteristics in the pre–financial crisis period can maintain their high performance in the post–financial crisis period and, if so, what operating characteristics are most important in managing a company through such a period. We identify the operating characteristics of companies that were not able to maintain high performance, companies that were able to enter high performance and companies that were able to sustain high performance. Identifying the important operating characteristics of each group of companies enables us to identify the specific areas of risks associated with working through a period of crisis.

Previous Research

Financial statements provide important information about a company's ability to achieve the strategic objective of creating value for its owners. They reflect how well a company's management has carried out the strategic and operating plans of the business. The marketplace, in turn, evaluates this performance, and a value is placed on the company. Analysts have traditionally conducted ratio analysis by examining ratios related to various aspects of a business's operations. Previous research related to financial statements, financial analysis, and ratio analysis has been conducted by, among others, Nissim and Penman (1999 and 2001), Brief and Lawson (1992), Fairfield and Yohn (1999), Feltham and Olsson (1995), Fera (1997), Jansen and Yohn (2002), Lev and Thiagarajan (1993), Ohlson (1995), Penman (1991), Piotroski (2000), Selling

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F. Check–Teck, "Conceptual lessons on financial strategy following the US sub–prime crisis," *The Journal of Risk Finance* 9, no. 3 (2008): 292–302; Werner De Bondt, "The crisis of 2008 and financial reform," *Qualitative Research in Financial Markets* 2, no. 3 (2010): 137–156; A. J. Schwartz, "Origins of the financial market crisis of 2008," *Cato Journal* 29, no. 1 (2009): 19–23; M. G. Ellis, "Time for a Visible Hand: Lessons from the 2008 World Financial Crisis," *Journal of Economic Issues* 45, no. 1 (2011): 249–251.

[2] Frigo, M. L., B. E. Needles, and M. Powers, "Strategy and Financial Ratio Performance Measures," In *Performance Measurement and Management Control*, edited by Mark Epstein and Jean–Francois Manzoni (London: JAI Elsevier Science Ltd., 2002), 341–359; Needles, B. E., M. L. Frigo, and M. Powers, "Strategy and Integrated Financial Ratio Performance Measures: Empirical Evidence of the Financial Performance Scorecard and High–Performance Companies," In *Performance Measurement and Management Control: A Compendium of Research*, edited by M. Epstein and J. Manzoni (London: JAI Elsevier Science Ltd, 2004), 115–151; Needles, B. E., M. Powers, and M. Frigo, "Strategy and Integrated Financial Ratio Performance Measures: Further Evidence of the Financial Performance Scorecard and High–Performance Companies," In *Studies in Financial and Managerial Accounting* 16, edited by Mark Epstein and Jean–Francois Manzoni (London: JAI Elsevier Science Ltd., 2006), 241–267; Needles, B. E., M. Powers, A. Shigaev, and M. L. Frigo, "Financial Characteristics of High Performance Companies in India," *Indian Accounting Review* 11, no. 1 (2007): 1–17; Needles, B. E., M. Powers, and M. Frigo, "Performance Measurement and Executive Compensation: Practices of High Performance Companies," In *Studies in Financial and Managerial Accounting* 16, edited by Mark Epstein and Jean–Francois Manzoni (London: JAI Elsevier Science Ltd., 2008), 303–322; Frigo, M. L., and J. Litman, *Driven: Business Strategy, Human Actions and the Creation of Wealth* (Chicago, IL: Strategy and Execution, 2008).

[3] Frigo, M.L., and R. J. Anderson, "Strategic Risk Management: A Foundation for Improving Enterprise Risk Management and Governance," *The Journal of Corporate Accounting & Finance*, March/April, 2011: 81–88; Frigo, M.L., and R. J. Anderson, "Strategic Risk Assessment: A first step for improving risk management and governance," *Strategic Finance*, December, 2009: 25–33.

[4] P. David, "Three Top Economists Agree 2009 Worst Financial Crisis Since Great Depression," accessed February 27, 2009, http://www.rueters.com.

and Stickney (1989), Burns, Sale, and Stephan (2008).[5] Soliman (2008) provides a thorough review of financial statement analysis literature.[6]

Initial research into the link between strategy and value creation began with an examination of the relation between three contrasting strategies: efficiency, innovation, and customer service. It has been extended to the emerging economy of India.[7] These studies found that different strategies are characterized by exceptional performance on different measures, that efficiency and innovation are better differentiators of high performance than customer service, and finally that developing and the emerging economy of India displays similar links among strategies and performance.

These early studies were followed by a more comprehensive examination of the links between strategy and integrated financial performance measurement by Needles, Frigo, and Powers (2004).[8] The objectives of this study were first to identify the financial characteristics of HPC and then to observe the sustainability of respective measures over contrasting test periods. Selection of HPC relied on a decade of research by Frigo and Litman that emphasized and defined a "Return Driven Strategy" framework under which business activities are highly aligned with ethically achieving maximum financial performance and shareholder wealth creation.[9] According to Return Driven Strategy, the pathway to superior financial value creation is through the customer, by fulfilling unmet needs in increasing market segments.[10] This framework describes the strategic activities of HPC in various industries and the underlying "strategic performance drivers" that have been shown to lead to sustainable shareholder wealth creation. It is robust in its ability to also explain the changes in companies' performance. This work provided the strategic underpinnings of our research.

Comparisons of HPC and other companies served to identify a set of ratios that were statistically independent of each other and a set of ratios that interact in integrated financial ratio analysis. This research resulted in the development of the Financial Performance Scorecard

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[5] Nissim, D., and S. H. Penman, "Ratio Analysis and Equity Valuation." (Working paper, 1999); Nissim, D., and S. H. Penman, "Ratio Analysis and Equity Valuation: From Research to Practice," *Review of Accounting Studies* 6 (2001): 109–54; Brief, R. P., and R. A. Lawson, "The Role of the Accounting Rate of Return in Financial Statement Analysis," *The Accounting Review* 67 (1992): 411–26; Fairfield, P. M., and T. L. Yohn, *Changes in Asset Turnover Signal Changes in Profitability* (McDonough School of Business, Washington, D.C.: Georgetown University, February, 1999); Feltham, G. A. and J. A. Olsson, "Valuation and Clean Surplus Accounting for Operating and Financial Activities," *Contemporary Accounting Research* 11 (1995): 689–731; N. Fera, "Using Shareholder Value to Evaluate Strategic Choices," *Management Accounting*, November, 1997: 45–55; Jansen, I., and T. L. Yohn, *Using Changes in Asset Turnover as Signal of Potential Earnings Management* (McDonough School of Business, Washington, D.C.: Georgetown University, 2002); Lev, B. and S. R. Thiagarajan, "Fundamental Information Analysis," *Journal of Accounting Research* 31 (1993): 190–215; J. A. Ohlson, "Earnings, Book Values, and Dividends in Equity Valuation," *Contemporary Accounting Research* 11 (1995): 661–867; S. H. Penman, "An Evaluation of Accounting Rate–of–Return," *Journal of Accounting, Auditing and Finance* 6 (1991): 233–55; J. D. Piotroski, "Value Investing: The Use of Historical Financial Statement Information to Separate Winners from Losers," *Journal of Accounting Research* 38, Supplement (2000): 1–51; Selling, T. I., and C. P. Stickney, "The Effects of Business Environment and Strategy on a Firm's Rate of Return on Assets," *Financial Analysts Journal* 45, January–February, 1989: 43–68; Burns, D. C., J. T. Sale, and J. A. Stephan, "A Better Way to Gauge Profitability," *Journal of Accountancy*, August, 2008: 38–42.

[6] M. T. Soliman, "The Use of DuPont Analysis by Market Participants," *The Accounting Review* 83, no. 3 (2008): 823–853.

[7] Needles, B. E., M. L. Frigo, and M. Powers, "Strategy and Financial Ratio Performance Measures: The Case of an Emerging Economy," *Indian Accounting Review* 6, no. 2 (2002): 1–15; Frigo, Needles, and Powers, "Strategy and Financial Ratio Performance Measures," 341–359.

[8] Needles, Frigo, and Powers. "Strategy and Integrated Financial Ratio Performance Measures: Empirical Evidence," 115–151.

[9] Frigo, M. L., and J. Litman, "What Is Return Driven Strategy," *Strategic Finance*, February, 2002: 11–13; Frigo and Litman. Driven.

[10] Frigo and Litman, "What Is Return Driven Strategy," 11–13; M. L. Frigo, "Performance Measures That Drive the First Tenet of Business Strategy," *Strategic Finance*, September, 2003: 8–11; M. L. Frigo, "Performance Measures That Drive the Goal Tenets of Strategy," *Strategic Finance*, October, 2003: 8–11; Litman, J., and M. L. Frigo, "When Strategy and Valuation Meet—Five Lessons from Return Driven Strategy," *Strategic Finance*, August, 2004: 31–39; Frigo and Litman, Driven.

(FPS). The FPS is a structure or framework for considering the interaction of financial ratios, with particular emphasis on the drivers of performance and their relationship to performance measures. These performance measures are reflected ultimately in a return that is compared with a benchmark cost of capital. If the return exceeds cost of capital, value has been created. If the return is less than cost of capital, value has been destroyed.[11]

The FPS is based on the premise that management must achieve certain financial objectives in order to create value and that these financial objectives are interrelated. Further, underlying the performance measures that analysts and the financial press commonly use to assess a company's financial performance are certain independent financial ratios, called performance drivers, which are critical to achieving the interrelated performance measures. While HPC uniformly excel on the basis of performance measures, they will not display uniform characteristics when it comes to performance drivers, because these measures are more a function of the various strategies that the companies may employ to achieve high performance.[12]

The FPS has five financial objectives–total asset management, profitability, financial risk, liquidity, and operating asset performance. An expanded view of these objectives is presented in Appendix A. The key financial characteristics (performance ratios) related to these objectives are classified into the categories of performance drivers and performance measures. In overall, the components of the FPS (financial objectives, performance drivers and measures) are summarized in Appendix B, while the formulas for the ratios represented in FPS appear in Appendix C. As companies improve or decline on one or more of the five performance drivers associated with each of the objectives of FPS, analysts may adjust their projections of future values. Similarly, managers may concentrate on increasing their companies' values by focusing efforts on achieving the financial objectives by improving the performance drivers associated with them.

As reflected in FPS, a common measure of performance in total asset management is growth in revenues. However, the fundamental driver of growth in revenues is asset turnover. Thus, management's objective is to manage the total assets of the business to achieve the most efficient use of assets in generating revenues.

Similarly, return on assets is probably the most common measure of profitability, but the underlying drivers of return on assets are asset turnover and profit margin (return on assets = asset turnover × profit margin). The key variable influencing the goal of profitability is profit margin, whereas, as already mentioned, asset turnover is related to the goal of total asset management. Thus, in combination, the goal is profitable growth in sales, which is a function of both asset turnover and profit margin.

Return on equity is often considered as a profitability measure. However, the key driver of this ratio is debt to equity, and the related goal is management's target for financial risk. Therefore, the return on equity is classified in FPS as a financial risk measure.

Free cash flows and cash flow returns on sales and assets are often used as measures of performance in liquidity management. The fundamental driver of these performance measures is cash flow yield. The cash flow yield is an important ratio for several reasons. One reason is that the long–term survival (and value) of a business depends on its ability to generate cash flows from its operations, and it begins with profitable operations that enable it to generate these cash flows. The cash flow yield measures whether net income has underlying cash flows from operations.

The previous research investigated evidence with regard to the components of the FPS, in particular, the relationships between the performance drivers and measures, as well as the relationships between the performance of the HPC and that of their respective industries. The em-

[11] Adman, M. A., and G. T. Haight, "A Fresh Look at Economic Value Added: Empirical Study of the Fortune Five–Hundred Companies," *The Journal of Applied Business Research* 18, no. 2 (2002): 27–36; Gebhardt, W. R., C. M. Lee, and B. Swaminathan, "Toward an Implied Cost of Capital," *Journal of Accounting Research* (2001): 135–176.
[12] Needles, Frigo, and Powers, "Strategy and Integrated Financial Ratio Performance Measures: Empirical Evidence," 115–151.

pirical results confirmed the basic propositions of the FPS and the criteria for choosing HPC. These results are summarized as follows:

1. The performance drivers and performance measures are independent of each other, as shown by low correlation among each other or low rank correlation. This proposition held true for all companies, for selected industries, and for industry leaders, with low correlations among performance drivers (except asset turnover and profit margin) and performance measures.
2. The criteria for choosing HPC were validated by the performance measures in the FPS model. The HPC exceed the industry averages across all performance measures and across all industries.
3. The HPC show mixed results with regard to performance drivers when compared with industry drivers. HPC excel on profit margin, are lower on cash flow yield, have lower financial risk, and have variable results for asset turnover. These results are due in part to the different strategies that companies may employ.

Subsequently, Needles, Powers, and Frigo (2006) replicated the abovementioned study with refinements that focused on the sustainability of performance by HPC and on operating asset management performance drivers and measures.[13] Operating asset management is oriented towards the management control of the cash conversion cycle (the time required to make or buy products, finance the products, and sell and collect for them). It shows the ability to utilize current assets and liabilities in a way that supports growth in revenues with minimum investment. The drivers of operating asset management are the three turnover ratios (inventory turnover, receivables turnover and payables turnover), and the performance measures are the days represented by each turnover measure. Taken together, the performance measures give an indication of the net cash cycle or financing period, which represents the time requirements for financing the operating activities (Financing period = days' receivable + days' inventory on hand–days' payable).

The hypothesis was that HPC would have a shorter financing period than S&P companies because their superior financial performance would be a reflection of their operating efficiency. The results confirmed this expectation, as follows:

1. The financing period for HPC compared to S&P companies was shorter in almost all cases, which equates to fewer days that need financing, thus lowering the financing costs for HPC relative to S&P companies.
2. The operating asset turnover ratios, however, showed more variability among industries and between HPC and S&P companies. As expected, HPC generally outperformed S&P companies on receivables turnover; however, overall, the HPC advantage was non–significant. This result could be accounted for by the fact that HPC have less need to sell receivables and take advantage of off–balance–sheet financing than S&P companies. Further, HPC are better able to take advantage of trade creditors.
3. Inventory turnover ratios were in line with our expectations that the HPC would outperform the S&P companies. Inventory turnover for HPC exceeded that of S&P, which represents fewer days of financing needed, more than offsetting the shortfall from receivables.

HPC had a slightly lower payable turnover than S&P companies. Strong operating results and low debt loads of HPC enable these companies to obtain longer terms than average from their

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[13] Needles, B. E., M. Powers, and M. Frigo, "Strategy and Integrated Financial Ratio Performance Measures: Further Evidence of the Financial Performance Scorecard and High–Performance Companies," In *Studies in Financial and Managerial Accounting* 16, edited by Mark Epstein and Jean–Francois Manzoni (London: JAI Elsevier Science Ltd., 2006), 241–267.

trade creditors, which accounted for most of the difference. Thus, the HPC' deficiencies noted above in receivables and inventory are overcome, so that these companies outperform their industry on the financing period.

In an extension of HPC research to the developing country of India and to the natural resource rich country of Australia (Needles, Powers, Shigaev, and Frigo, 2007), the relationships among performance drivers and performance measures observed in the Western economies were found to hold with the exception of asset turnover in India and payables turnover in both countries.[14] The low asset turnover ratios in Indian companies were attributed to the preponderance of asset–intense infrastructure companies among the HPC. The existence of higher payables turnover in Western developed countries reflects more willingness to rely on the credit of suppliers in these countries.

Further, 20–year (1988–2007) longitudinal results confirm the results of prior studies as to the long–term superior performance of HPC over other companies. For sustaining HPC, results were consistent as to total asset management, profitability, financial risk, and liquidity. Exiting HPC companies fail at total asset management, profitability, and operating asset management and significantly increase their financial risk. Emerging HPC improve liquidity through improved operating asset management and cash flows. To become a HPC, a company must generate increased cash flows from income, manage receivables and inventory vigorously, and reduce its debt in relation to equity. Thereafter, management must concentrate on maintaining its asset turnover and growth in revenues while maintaining its profit margin and not increasing its debt to equity (Needles, Shigaev, Powers, and Frigo, 2010).[15]

Research Questions

As noted above, previous research addressed issues of on what measures do HPC excel and can they sustain high performance over contrasting future periods. This study focuses on the issue of which performance drivers and measures are most likely to lead to falling from HPC status and the risks associated with those drivers and measures. Specifically, this study empirically investigates 1,480 companies in the United States and twenty–two other countries (MSCI index) over the periods 1998–2007 (benchmark) and 2008–2009 to identify HPC from the former period that exited, maintained, or entered HPC status in the latter period including

1. The operating characteristics of companies that were able to sustain high performance from 1998–2007 into 2008–2009.
2. The operating characteristics (performance drivers and performance measures) and associated risk factors which were most critical for companies that exited HPC status in 2008–2009.
3. The operating characteristics that were most critical for companies that emerged to HPC status in the post–financial crisis period.

Empirical Sample

Data for this study came from the CompuStat database. The analysis focuses on two groups of companies: companies in the MSCI World index, and HPC. In the benchmark group, we

[14] Needles, B. E., M. Powers, A. Shigaev, and M. L. Frigo, "Financial Characteristics of High Performance Companies in India," *Indian Accounting Review* 11, no. 1 (2007): 1–17; Needles, B. E., M. Powers, and A. Shigaev, "Financial Characteristics of High Performance Companies in Australia" (working paper presented at the Sydney University Accounting Research Foundation, Sydney, March 23, 2009).

[15] Needles, B. E., A. Shigaev, M. Powers, and M. L. Frigo, "Strategy and Integrated Financial Ratio Performance Measures: A Longitudinal Multi–Country Study of High Performance Companies," In *Studies in Financial and Managerial Accounting* 20, edited by Mark Epstein and Jean–Francois Manzoni (London: JAI Elsevier Science Ltd., 2010), 211–252.

started with 1480 companies in the MSCI World index for which data existed consecutively from 1998 to 2009 (610 companies from USA and 870 companies from other countries). The current countries and industries that make of the MSCI World Index are shown in Appendices D and E.

Several industries whose financial structures typically depart from industrial, retail, and service businesses (banks, savings institutions, credit institutions, other financial institutions, financial services (broker) companies, insurance companies, real estate agents and operators of buildings, real estate investments trusts, hotels, personal services, miscellaneous recreation services, health services, hospitals, educational services, and child day care services) were excluded from the benchmark group of MSCI World companies. In total, 175 companies (146 companies from USA and 29 companies from other countries) were excluded from the benchmark group. This adjustment improved the comparability of the benchmark group with the HPC. After that screen, our sample had 1305 MSCI World companies (464 companies from USA and 841 companies from other countries).

Companies included in the HPC group were removed from the MSCI World sample. After all screens, the size of the benchmark group in the benchmark period (1998–2007) was equal to 1243.

HPC were identified from the HOLT database from Credit Suisse. In determining Global HPC, we identified 13 samples of HPC for 13 consecutive ten–year periods (from 1988–1997 to 2000–2009) where data was available from 1987 to 2009 according to the following criteria:

- Cash flow return on investment at twice or more the cost of capital or greater than 5% discount rate for ten consecutive years
- Cumulative growth rate in total assets over ten year period exceeds cumulative growth rate of World GDP over the same ten–year period
- Cumulative total shareholder returns over ten–year period above the MSCI World cumulative return over the same ten–year period

Methodology

The performance of the HPC was compared to that of their respective industries and was expected to excel above their industry peers on performance drivers and measures which are overall indicators of success or failure in achieving the financial objectives of total asset management, profitability, financial risk, liquidity, and operating asset management.

Ratios were calculated for each company for each year for years 1988–2009 (Year 1987 was used to calculate averages that were used in the formulas).

In the analyses, HPC were grouped in three categories:

- Sustaining–Companies that appeared in the 10 year periods of 1998–2007 and in the period 2008–2009.
- Exiting–Companies that appeared in the 10 year period of 1998–2007 but did not appear in the period 2008–2009.
- Emerging–Companies that did not appear in the period 1998–2007 but appeared in the period 2008–2009.

Companies were also grouped by the first two digits of the SIC code. In the benchmark sample, fifty–one industries were identified based on this grouping. In some industries, there were not enough HPC to derive reliable industry averages and discuss industry–specific results. We provide test data for industries in which we had at least three HPC (with two–digit SIC indicator).

For sustaining HPC, companies were identified which were HPC in the periods 1998–2007 and continued to be HPC in the period 2008–2009 and the means for each ratio were calculated for the period 2008–2009. For exiting HPC, the means for each ratio were calculated for the period 2008–2009. The sample of exiting HPC includes companies, which were HPC in the period 1998–2007 but were not HPC in the period 2008–2009. For emerging HPC, companies were identified which were not HPC in the period 1998–2007 but were HPC in the period 2008–2009 and the means for each ratio were calculated for the following period: 2008–2009.

The next part of the study examined the relative performance of the HPC in relation to the mean performance of their peers among MSCI World index constituents for each of the abovementioned test periods (2008–2009 for sustaining HPC, 2008–2009 for exiting HPC, and 2008–2009 for emerging HPC). We expect "high performance" companies to excel above their industry peers on performance drivers and measures in periods when they held the HPC status. As to the periods when exiting and emerging HPC did not hold the HPC status, we expect more variation in their performance.

To test the significance of the differences between HPC and MSCI World companies, the T–test was used. To get better results on the T–test, we applied the Grubbs' test and eliminated outliers for various ratios. There are no outliers at the specific significance level if the Grubbs' test statistic is less than the upper critical value. In all cases, outliers represented less than 5% of the sample, usually much less than 5%. The elimination of outliers did not change the conclusions reached in examining the full set of data, but did affect the significance level on some ratios. In most cases, the results improved with the elimination of outliers. In the following sections, we will discuss the results with outliers eliminated, unless otherwise noted.

Some other quantitative approaches and methods could include the ANOVA procedure, the joint test of significance, the multiple discriminant analysis (MDA). However, the type of variables analyzed in our study and the design of the research questions make it appropriate to apply the t–test instead of other procedures. Thus, our research does not use a regression model, and therefore it would not be appropriate to apply the joint test of significance. MDA was used by Altman (1968) to develop the model of the prediction of corporate bankruptcy.[16] However, MDA would not be appropriate to the analysis of HPC performance in our study, because our research model does not derive a linear combination of those company's individual characteristics (performance ratios), which "best" discriminates between the groups of companies, nor does it determine a set of discriminant coefficients. At the same time it is necessary to note that some other studies also compared financial ratios. For example, Beaver (1966) conducted the analysis of financial ratios in a bankruptcy–prediction context, and compared a list of ratios individually for failed firms and a matched sample of non–failed firms.[17] However, none of the previous studies conducted the analysis of the performance ratios (performance drivers and measures) of HPC.

Findings

As noted above, the following criteria from previous studies (see above) as determined by Frigo were applied to the period 1988–2008: cash flow return on investment (CFROI screen), cumulative growth rate in total assets, cumulative total shareholder returns (TSR screen).[18]

Table 1 shows the results of these screens over the 13 ten–year periods. The number of high performance companies increased from only 13 in 1888–1997 to a peak of 116 in 1998–2007

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[16] E. I. Altman, "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy," *The Journal of Finance*, Vol. 23, No. 4. (Sep., 1968): 589–609.
[17] W. H. Beaver, "Financial Ratios as Predictors of Failure," Empirical Research in Accounting, Selected Studies, 1966 (Institute of Professional Accounting, January, 1967): 71–111.
[18] M.L. Frigo, "Strategic Competencies of Return Driven Strategy," *Strategic Finance*, June, 2002: 6–9; Frigo, "the First Tenet of Business Strategy," 8–11; Frigo, "the Goal Tenets of Strategy," 8–11.

up to the financial crisis. The number dropped in 1999–2008 to 99 but recovered to 113 in 2000–2009. U.S. companies have dominated HPC throughout but over time companies in other countries have increased their presence as HPC. For instance, in 1988–97, 10 of the 13 HPC were from the U.S with one each from France, Germany, and Japan, but by 1998–07, 27 of 116 HPC were from 13 countries outside the U.S. The complete period–by–period breakdown may be found in Appendix F.

Table 1: The Number of Companies Selected by the Consecutive Application of each Screen

Time period	88–97	89–98	90–99	91–00	92–01	93–02	94–03	95–04	96–05	97–06	98–07	99–08	00–09
CFROI Screen	115	135	154	192	193	182	189	222	267	286	371	253	252
Asset Growth Screen	35	50	58	87	104	101	109	133	181	192	254	158	163
TSR Screen	13	16	19	29	42	53	56	66	84	77	116	99	113

As a benchmark for HPC, Table 2 shows the performance of HPCs relative to the MSCI World for all thirteen ten–year periods. Note that in all cases, HPC outperformed the World MSCI companies for all performance drivers and performance measures in all periods. In the analysis of total asset management, profitability and financial risk ratios presented in the table 2a, the differences in favor of HPC in all cells were significant at the 0.01 level or better (the differences in 75 cells were significant at the 0.000000 level, and the differences in 3 cells were significant at the 0.001688, 0.000039, and 0.000021 levels).

In the analysis of liquidity ratios presented in the table 2b, the differences in favor of HPC in all cells on cash flow yield, cash flow return on total assets and free cash flow were significant at the 0.000000 level. The differences in favor of HPC in cells on cash flow return on stockholders' equity were significant at the level of 0.01 or better except for the period of 1989–98 when the significance level was 0.049298.

The analysis of operating asset management ratios showed more variation in terms of significance levels. In the table 2c, the differences in almost all cells were significant at the level 0.05 or better in the first 4 periods (the differences in inventory turnover were not significant in 1988–97 and 1989–98). In the next 9 periods, the differences in all cells on operating asset management ratios were significant at the level 0.01 or much better.

It is necessary to note that the table 2c does not show T–test statistics for performance measures in operating asset management. These measures were calculated as the reciprocals of operating asset management performance drivers multiplied by 365. Therefore, for the purposes of the analysis of HPC performance in comparison to MSCI World companies, the harmonic means instead of regular means were computed for the performance measures of operating asset management. In these circumstances, regular t–test would not be completely appropriate.

Table 2: Global HPC Performance Compared with MSCI World–All Ten–Year Periods

Table 2a: Global HPC: 1988–2009 Total Asset Management, Profitability, and Financial Risk

Time period	Performance Drivers			Performance Measures		
	Asset turnover	Profit margin	Debt to Equity	Growth in Revenues	Return on assets	Return on equity
1988–97	28.35%	68.60%	–175.19%	50.61%	71.42%	62.91%
T–test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1989–98	23.42%	75.82%	–62.25%	55.32%	73.13%	70.71%
T–test	0.000000	0.000000	0.001688	0.000000	0.000000	0.000000
1990–99	17.66%	78.30%	–81.45%	74.11%	74.34%	69.01%
T–test	0.000039	0.000000	0.000000	0.000000	0.000000	0.000001
1991–00	21.05%	70.81%	–90.04%	82.34%	73.04%	62.41%
T–test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1992–01	26.14%	63.10%	–69.86%	73.43%	68.87%	57.62%
T–test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1993–02	24.75%	63.48%	–32.98%	74.49%	67.77%	60.10%
T–test	0.000000	0.000000	0.000021	0.000000	0.000000	0.000000
1994–03	21.43%	65.87%	–58.30%	77.24%	66.10%	55.85%
T–test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1995–04	29.28%	63.23%	–71.95%	76.62%	66.07%	58.98%
T–test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1996–05	33.13%	59.80%	–52.29%	75.63%	62.17%	60.31%
T–test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1997–06	32.96%	54.86%	–48.18%	75.57%	60.86%	59.53%
T–test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1998–07	33.24%	49.86%	–42.64%	72.42%	59.29%	58.81%
T–test	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1999–08 T–test	26.22% 0.000000	52.96% 0.000000	–62.88% 0.000000	94.85% 0.000000	58.16% 0.000000	50.44% 0.000000
2000–09 T–test	24.57% 0.000000	54.44% 0.000000	–40.73% 0.000000	89.43% 0.000000	61.21% 0.000000	57.41% 0.000000

Table 2b: Global HPC: 1988–2009 Liquidity

Time period	Performance driver	Performance measures		
	Cash flow yield	Cash flow return on total assets	Cash flow return on stockholders' equity	Free Cash Flow
1988–97	−127.16%	49.36%	27.96%	88.76%
T–test	0.000000	0.000000	0.001021	0.000000
1989–98	−91.05%	53.82%	50.06%	87.98%
T–test	0.000000	0.000000	0.049298	0.000000
1990–99	−77.58%	60.36%	45.93%	90.55%
T–test	0.000000	0.000000	0.007932	0.000000
1991–00	−91.28%	55.61%	37.59%	87.68%
T–test	0.000000	0.000000	0.006334	0.000000
1992–01	−76.48%	48.51%	28.51%	79.59%
T–test	0.000000	0.000000	0.000880	0.000000
1993–02	−86.73%	46.97%	21.42%	80.37%
T–test	0.000000	0.000000	0.003469	0.000000
1994–03	−93.96%	44.64%	18.34%	79.16%
T–test	0.000000	0.000000	0.000116	0.000000
1995–04	−95.72%	45.16%	24.57%	78.59%
T–test	0.000000	0.000000	0.000000	0.000000
1996–05	−87.79%	41.94%	24.42%	76.35%
T–test	0.000000	0.000000	0.000288	0.000000
1997–06	−81.14%	42.39%	35.80%	71.64%
T–test	0.000000	0.000000	0.000475	0.000000
1998–07	−83.67%	39.37%	28.99%	68.61%
T–test	0.000000	0.000000	0.000000	0.000000
1999–08	−89.15%	40.26%	22.31%	70.38%
T–test	0.000000	0.000000	0.000000	0.000000
2000–09	−121.80%	41.93%	31.08%	69.04%
T–test	0.000000	0.000000	0.000000	0.000000

Table 2c: Global HPC: 1988–2007 Operating Asset Management

Time period	Performance Drivers			Performance Measures			
	Receivables turnover	Invent-ory turnover	Payables turnover	Average days' sales uncollected	Average days' inventory on hand	Average days' payable	Financing period
1988–97	13.07%	4.23%	12.72%	–15.04%	–4.42%	–14.58%	–5.25%
T–test	0.000485	0.296459	0.086716				
1989–98	10.06%	8.94%	15.96%	–11.19%	–9.82%	–18.99%	–4.23%
T–test	0.000162	0.106696	0.017797				
1990–99	26.62%	29.48%	–10.68%	–36.28%	–41.79%	9.65%	–318.63%
T–test	0.031139	0.008284	0.043212				
1991–00	9.85%	18.85%	11.27%	–10.92%	–23.23%	–12.70%	–21.39%
T–test	0.028273	0.021447	0.007793				
1992–01	40.38%	15.04%	18.40%	–67.72%	–17.70%	–22.55%	–47.35%
T–test	0.007602	0.008665	0.000001				
1993–02	37.02%	20.32%	11.39%	–58.77%	–25.51%	–12.85%	–83.27%
T–test	0.009208	0.009351	0.000526				
1994–03	–5.10%	25.09%	11.59%	4.85%	–33.49%	–13.11%	–10.91%
T–test	0.009795	0.008217	0.007955				
1995–04	32.40%	35.23%	16.94%	–47.94%	–54.40%	–20.39%	–127.79%
T–test	0.008145	0.001329	0.000003				
1996–05	44.75%	19.96%	19.53%	–81.00%	–24.93%	–24.27%	–106.24%
T–test	0.000000	0.009709	0.000000				
1997–06	63.35%	–16.97%	21.56%	–172.84%	14.51%	–27.48%	–26.04%
T–test	0.000000	0.009255	0.000000				
1998–07	48.75%	–31.19%	15.44%	–95.12%	23.77%	–18.27%	–14.37%
T–test	0.000000	0.009887	0.000000				
1999–08 T–test	–20.35% 0.000000	–75.58% 0.000000	10.32% 0.000459	16.91%	43.05%	–11.51%	60.86%
2000–09 T–test	–12.87% 0.000074	–91.21% 0.000000	17.36% 0.000000	11.40%	47.70%	–21.01%	64.38%

Appendix G provides a comprehensive list of HPC for three time periods under study: 116 companies in 1998–07, 99 in 1999–08, and 113 in 2000–09. Significant movement by HPC among recent ten–year periods may be observed and is summarized in Table 3. This table shows the movement of HPC in three most recent ten–year periods including the period of financial crisis. In summary, 56 companies sustained high performance over the entire period and 41 companies dropped out after the first period and another 14 dropped out after the second period. Seventeen companies were entering for both crisis periods, 14 for the first crisis period

and 33 for the second for a total of 64 entering companies. Seven companies were part of the original HPC group and reentered in 2000–09. The following sections examine performance characteristics of the sustaining, exiting, and entering HPC.

Table 3: High Performance Companies in Three Ten–Year Time Periods

Group of HPC	98–07	99–08	00–09	Number of HPC
Sustaining	X	X	X	56
Exiting after 98–07	X			41
Exiting after 99–08	X	X		12
Entering		X	X	17
Entering only in 99–08		X		14
Entering only in 00–09			X	33
Reentering	X		X	7
Totals	116	99	113	

Objective 1: Sustainability of HPC: 1998–2009 Sustaining HPC Performance Compared with MSCI World: 2008–2009

Table 4 addresses the sustainability of performance in HPC over 1998–2009. As noted above, sustaining HPC appeared throughout 1998–2009. Industry statistics are shown when an industry (based on the first two SIC classification digits) is represented by three HPC or more HPC.

In Table 4a, as in previous periods, HPC in total excel in total asset management, profitability, and financial risk performance drivers and performance measures are significant at least at 0.005 levels. These companies are very strong on asset turnover performance driver and on the performance measures of growth in revenues, profit margin, return on equity and return on assets with much less debt. These results are also reflected in the performance of five industry groups, although not as significant in all cases due to the lower sample sizes. Industry 73 (IT services and software) is an exception in showing a lower asset turnover

Table 4b examines liquidity measures. A prior study by Needles, Powers, and Frigo (2006) examined the apparent anomaly of generally lower cash flow yields for HPC.[19] This analysis showed that weak companies tend to have lower incomes and more non–cash adjustments such as restructurings and losses on sales of assets that produce very high artificial cash flow yields. HPC tend to have very consistent cash flow yields in the range of 1.0 to 3.0. The results in Table 4b are consistent with these prior findings. HPC had lower cash flows yields than other companies and the differences are significant. However, the low cash flow yield translates into exceptional performance in cash flow return on assets, cash flow return on stockholders' equity, and free cash flow in which HPC exceed other MSCI companies by significant amounts (0.0001 level). Industry groups showed the same characteristics with differences usually significant at least at the 0.05 level.

Operating asset management results in Table 4c display a major anomaly. Inventory turnover and receivables turnover are lower as compared to MSCI industries. Past results would as shown in Table 2c above would lead to the expectation that HPC would usually excel in these turnover ratios in difficult times. However, this is not the case in the period ending in 2008 and 2009. This may be due to the financial difficulties of customers and the slowness of payment during

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[19] Needles, Powers, and Frigo, "Strategy and Integrated Financial Ratio Performance Measures: Further Evidence," 241–267.

the GFC years 2008, 2009. HPC accounts receivable collection is dependent on the ability of customers to pay the bills, as well as the receivable processes of the HPC. The longer inventory turnover may be explained by the desire to manage risk in the supply chain during the financial crisis plus low demand on the customer side. On the other hand, it is likely the banking crisis, which limited loans to companies in light of the high financial risk characteristic of non–HPC companies, led to these companies reducing receivables and inventories to come more in line with high performers. Payable turnover did not show a significant difference. Also, industry results generally did not show significant differences.

Table 4: 1997–2009 Sustaining HPC Performance Compared with MSCI World: 2008–2009

Table 4a: 1997–2009 Sustaining HPC: 2008–2009 Total Asset Management, Profitability, and Financial Risk

Industry	Performance Drivers			Performance Measures		
	Asset turnover	Profit margin	Debt to Equity	Growth in Revenues	Return on assets	Return on equity
28	10.93%	43.80%	–7.00%	73.68%	39.73%	63.44%
T–test	0.311548	0.077066	0.431931	0.226859	0.009951	0.044330
37	10.28%	67.95%	–36.58%	199.19%	67.95%	54.26%
T–test	0.013749	0.012956	0.039585	0.038916	0.013277	0.017807
38	9.36%	63.52%	–79.12%	113.12%	63.88%	69.91%
T–test	0.076570	0.000000	0.000435	0.039581	0.000001	0.000469
51	21.12%	48.48%	–4.33%	2.84%	54.84%	46.02%
T–test	0.195189	0.055125	0.412242	0.482810	0.030601	0.019281
73	–44.91%	58.38%	–156.88%	68.47%	54.60%	28.87%
T–test	0.021661	0.000610	0.002447	0.279453	0.008854	0.024253
All	20.19%	55.36%	–52.07%	136.00%	62.78%	61.38%
T–test	0.004523	0.000000	0.000004	0.000002	0.000000	0.000000

Table 4b: 1997–2009 Sustaining HPC: 2008–2009 Liquidity

	Performance driver	Performance measures		
Industry	Cash flow yield	Cash flow return on total assets	Cash flow return on stockholders' equity	Free Cash Flow
28	–49.70%	24.60%	52.71%	69.06%
T–test	0.004442	0.004456	0.043085	0.027636
37	–129.50%	34.04%	35.65%	90.13%
T–test	0.000223	0.022882	0.129083	0.179175
38	–26.60%	45.12%	29.38%	62.62%
T–test	0.007749	0.000006	0.008672	0.000008
51	–20.46%	74.01%	83.80%	122.90%
T–test	0.278737	0.005963	0.008522	0.004207
73	–60.86%	35.32%	10.24%	55.21%
T–test	0.002022	0.001439	0.284694	0.008939
All	–79.68%	36.39%	24.43%	74.70%
T–test	0.000000	0.000000	0.000196	0.000000

Table 4c: 1997–2009 Sustaining HPC: 2008–2009 Operating Asset Management

	Performance Drivers			Performance Measures			
Industry	Receivables turnover	Inventory turnover	Payables turnover	Average days' sales uncollected	Average days' inventory on hand	Average days' payable	Financing period
28	20.94%	–34.76%	4.26%	–26.49%	25.79%	–4.45%	20.74%
T–test	0.132132	0.096056	0.380769				
37	21.81%	–51.51%	17.09%	–27.89%	34.00%	–20.61%	25.08%
T–test	0.012525	0.000348	0.030322				
38	3.29%	–38.24%	9.81%	–3.40%	27.66%	–10.87%	25.90%
T–test	0.300207	0.017590	0.221412				
51	11.45%	3.89%	21.18%	–12.93%	–4.05%	–26.87%	31.25%
T–test	0.318829	0.392208	0.163077				
73	–1.36%	.	–8.78%	1.34%	.	8.07%	.
T–test	0.451554	.	0.433420				
All	–24.36%	–173.20%	11.91%	19.59%	63.40%	–13.52%	76.27%
T–test	0.000057	0.000000	0.062031				

Objective 2: Characteristics of Companies that Exit HPC Status (Exiting HPC)

The second objective of this paper addresses companies that exit the HPC classification. This section examines exiting HPC (Table 5), which are defined as HPC that appear in the ten–year period of 1998–2007 but did not appear in the period 2008–2009.

Although companies exiting HPC were able to maintain their advantage (Table 5a) in profitability (profit margin) and financial risk (debt to equity) and thus were able to excel in return on assets and return on equity, they were not able to maintain a significant advantage in total asset management (total asset turnover). As a result, the advantage in growth in revenues is not significant at the 0.05 level. This confirms prior studies that asset management is a key factor in defining high performance. The HPC in Industries 15 (Building Construction General Contractors and Operative Builders) and 36 (Electronic Equipment and Components), the only two industries with three or more exiting firms, were able to maintain profit margins and perform very well on the debt–equity as compared to MSCI industries. The results of the return on assets and return on equity for Industry 15, however, were not significant at the 0.05 level.

Table 5b reveals that cash flow yield for exiting HPC was consistently less than that for other MSCI companies across all industries as is expected. This finding is consistent with the strong profitability performance in Table 5a. As a result, cash flow return on total assets and free cash flow continued to exceed those of the other companies. The results of cash flow return on stockholders equity were not significant at the 0.05 levels. Industry differences, with one exception, were not significant at the 0.05 level.

In the 2008–2009, exiting HPC excelled over other MSCI companies (Table 5c) on receivable turnover but had a lower inventory turnover and payables turnover. Overall, the exiting HPC had a longer financing period by 24.08% indicating poorer operating asset management during this period. The performance measure of average days' sales uncollected was substantially low for exiting HPC companies, whereas the performances on average days' inventory on hand and average days' payable were better as compared to the MSCI companies.

Table 5: Exiting HPC Performance Compared with MSCI World: 2008–2009

a) Exiting HPC 2008–2009–Total Asset Management, Profitability and Financial Risk

Industry	Performance Drivers			Performance Measures		
	Asset turnover	Profit margin	Debt to Equity	Growth in Revenues	Return on assets	Return on equity
15	–7.63%	420.76%	–565.18%	–63.73%	321.53%	309.71%
T–test	0.405767	0.005336	0.000000	0.074938	0.079287	0.101402
36	9.17%	91.50%	–99.95%	45.27%	83.86%	96.08%
T–test	0.184010	0.025554	0.009630	0.396960	0.046926	0.023697
All	22.27%	53.82%	–60.90%	–23.85%	64.34%	75.89%
T–test	0.007451	0.000042	0.002121	0.436352	0.000003	0.035070

b) Exiting HPC 2008–2009–Liquidity

Industry	Performance driver	Performance measures		
	Cash flow yield	Cash flow return on total assets	Cash flow return on stockholders' equity	Free Cash Flow
15	–84.04%	46.72%	–15.99%	80.97%
T–test	0.190808	0.190739	0.388965	0.127092
36	–45.81%	50.58%	41.64%	70.91%
T–test	0.063292	0.053662	0.048117	0.164774
All	–61.89%	39.75%	55.66%	67.34%
T–test	0.000003	0.000016	0.080114	0.000024

c) Exiting HPC 2008–2009–Operating Asset Management

Industry	Performance Drivers			Performance Measures			
	Receivables turnover	Inventory turnover	Payables turnover	Average days' sales uncollected	Average days' inventory on hand	Average days' payable	Financing period
15	62.44%	–261.97%	11.92%	–166.22%	72.37%	–13.53%	80.69%
T–test	0.137249	0.002093	0.364200				
36	–7.34%	5.78%	–17.72%	6.84%	–6.14%	15.05%	–16.89%
T–test	0.277979	0.408820	0.007837				
All	56.06%	–127.28%	–14.32%	–127.58%	56.00%	12.53%	24.08%
T–test	0.007247	0.000000	0.040968				

Objective 3: Characteristics of Companies that Enter HPC Status (Emerging HPC)

This section examines emerging HPC (tables 6), which are defined as companies that did not appear at all in the ten–year period of 1997–2008 but appeared in 2008–2009.

In accordance with expectations for HPC, emerging HPC show very strong profitability results in 2008–2009 (Table 6a) accompanied by lower financial risk. Advantages were significant at the 0.00000 level. However, asset turnover differences are negative and not significant at the 0.05 levels, but growth in revenues far exceeded non–HPC companies and was also significant at the 0.00000 level. Industry measures displayed similar characteristics but were strongest and significant for profit margin and return on assets and return on equity.

Cash flow yield is lower (Table 6b), as is now expected (see discussion above). Cash return on total assets, cash flow return on stockholders' equity and free cash flows are strongly positive. These conclusions hold for all four industries and in most cases are significant at the 0.05 level.

The results of all turnover ratios are significant at the 0.05 levels and negative as we are now seeing as a trend among HPC in the later periods of these studies. In 2008–2009, the emerging HPC scored significantly less on inventory turnover across all industries. Although all industries combined the financing period is larger as compared to MSCI industries, however industries

20, 28 and 73 score lower in terms of financing period in their respective groups as compared to MSCI industries.

Table 6: Emerging HPC Performance Compared with MSCI World: 2008–2009

a) Emerging HPC 2008–2009–Total Asset Management, Profitability and Financial Risk

Industry	Performance Drivers			Performance Measures		
	Asset turnover	Profit margin	Debt to Equity	Growth in Revenues	Return on assets	Return on equity
20	–34.17%	62.24%	–2.30%	79.98%	55.48%	58.77%
T–test	0.027171	0.009758	0.473444	0.162740	0.012319	0.036425
28	–38.69%	57.19%	–49.23%	78.38%	45.15%	47.03%
T–test	0.000003	0.000000	0.001557	0.054595	0.000030	0.001946
38	–11.72%	69.67%	–11.99%	135.98%	69.83%	70.20%
T–test	0.156897	0.000030	0.318699	0.017945	0.000750	0.000280
73	–19.09%	49.46%	22.17%	72.52%	53.84%	41.83%
T–test	0.025994	0.021261	0.184208	0.237044	0.030597	0.000015
All	–0.77%	64.87%	–48.48%	156.30%	66.00%	60.82%
T–test	0.465851	0.000000	0.000006	0.000000	0.000000	0.000000

b) Emerging HPC 2008–2009–Liquidity

Industry	Performance driver	Performance measures		
	Cash flow yield	Cash flow return on total assets	Cash flow return on stockholders' equity	Free Cash Flow
20	–118.94%	33.73%	37.01%	58.80%
T–test	0.000005	0.049487	0.106875	0.015782
28	–70.52%	29.02%	30.85%	68.37%
T–test	0.000006	0.001137	0.030418	0.000429
38	–61.85%	38.63%	33.66%	46.89%
T–test	0.015456	0.017502	0.041968	0.021685
73	–88.03%	31.26%	20.35%	43.38%
T–test	0.000006	0.101530	0.083286	0.101176
All	–96.77%	34.20%	14.84%	68.58%
T–test	0.000000	0.000002	0.027590	0.000000

c) Emerging HPC 2008–2009–Operating Asset Management

Industry	Performance Drivers			Performance Measures			
	Receivables turnover	Inventory turnover	Payables turnover	Average days' sales uncollected	Average days' inventory on hand	Average days' payable	Financing period
20	15.52%	–11.31%	–53.37%	–18.37%	10.16%	34.80%	–129.87%
T–test	0.072442	0.197364	0.013361				
28	7.50%	–43.09%	–57.60%	–8.11%	30.12%	36.55%	–4.99%
T–test	0.240696	0.000519	0.004412				
38	–4.56%	–87.30%	–13.67%	4.36%	46.61%	12.03%	41.02%
T–test	0.210752	0.000461	0.215914				
73	–13.49%	–282.62%	–200.83%	11.89%	73.86%	66.76%	–198.42%
T–test	0.404410	0.000038	0.000000				
All	–21.15%	–221.23%	–23.52%	17.46%	68.87%	19.04%	75.28%
T–test	0.014888	0.000000	0.022920				

Conclusion

This study has examined HPC in the MSCI index over three ten–year periods: 1998–07, 1999–08, 2000–09. The latter two periods correspond roughly to the period of global financial crisis. It is now possible to draw some guidance to management during periods of stress:

- Companies that are able to maintain high performance over periods of financial stress clearly excel in total asset management, profitability, and financial risk as well as liquidity as measured by cash returns. It is also clear that turnover ratios (operating management of receivables, inventory, and payables) have become less important in recent years as an indicator of high performance. The latter finding is very likely the direct result of the financial crisis which forced all companies to reduce receivables and inventories due to shortage of debt, high financial risk, and lacking of lending ability by banks.
- Although exiting companies are able to maintain profitability, financial risk and liquidity, the key factor in their dropping out of HPC status is their failure to manage assets turnover and grow revenues.
- It is strong profitability accompanied by robust cash flows that enable companies to enter HPC status. Asset turnover is not a key factor in becoming HPC. It appears to be more important in sustaining HPC status. Also, as above, operating asset measurements do not appear to be key factors with emerging to HPC status.

In summary, for companies to achieve HPC status and to maintain HPC status once they have it, there are six key numbers or financial statement elements that must be aggressively managed:

- Revenue
- Net Income
- Cash flow from operating activities
- Total Assets
- Total Liabilities
- Total Equity

which combine in various ways to produce four key performance drivers:

- Asset Turnover (Revenue/Average Total Assets)
- Profit Margin (Net Income/Revenue)
- Cash Flow Yield (Cash Flow From Operating Activities/Net Income)
- Debt to Equity (Total Liabilities/Total Equity)

Obviously there are many factors and drill–downs that lie behind these six key financial statement elements and the resulting four key ratios but they should serve to focus management's attention intensely. The risk management faces is that the profitability and liquidity financial performance measures that flow from these basic elements and key ratios will quickly suffer in periods of financial downturn. Further, for managements that aspire for their companies to achieve HPC status, they provide opportunities. This is clear from the number of companies that were able to sustain high performance and the number able to emerge as a high performers, that periods of financial stress can be periods of opportunity. Given the fact that less than ten percent of companies ever achieve HPC status, it is not an easy assignment.

Limitations and Future Research

Although it is intended to be broadly representative of global financial markets, the MSCI Index used in this study is weighted toward large companies in developed countries. We have not taken into account the effects of many countries that adopted IFRS or a variation thereof during the past five years. Future studies can address a broader population and examine the effects of IFRS. We also did not look at effect of industry classifications on high performance. This will be the subject of future research.

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Appendix A: Expanded View of Financial Performance Objectives

Financial Performance Objectives	Links to Financial Performance
Total asset management	Ability to utilize all the assets of a company in a way that maximizes revenue while minimizing investment
Profitability	Ability to earn a satisfactory net income
Financial risk	Ability to use debt effectively without jeopardizing the future of the company
Liquidity	Ability to generate sufficient cash to pay bills when they're due and to meet unexpected needs for cash
Operating asset management	Ability to utilize current assets and liabilities to support growth in revenues with minimum investment

Appendix B: Components of the Financial Performance Scorecard

Financial Performance Objectives	Performance Ratios	
	Drivers	Measures
Total asset management	Asset turnover	Growth in revenues
Profitability	Profit margin	Return on assets
Financial risk	Debt to equity	Return on equity
Liquidity	Cash flow yield	Cash flow returns
		Free cash flows
Operating asset management	Turnover ratios:	Cash cycle:
	Receivables turnover	Days' sales uncollectible
	Inventory turnover	Days' inventory on hand
	Payables turnover	Days' payable
		Financing Period

Appendix C: Formulas for Ratio Computations

Performance Drivers

- Asset turnover: Net sales/average total assets
- Profit margin: Net income/net sales
- Debt to equity: (Total assets–stockholders' equity)/stockholders' equity
- Cash flow yield: Cash flows from operating activities/net income
  (In the analysis, if either the numerator or denominator of the cash flow yield was negative, the ratio was excluded.)

Valuation Performance Measures

- Growth in revenues: Change in net sales / net sales
- Return on assets: Net income / average total assets
- Return on equity: Net income/average stockholders' equity
- Cash flow returns: Cash flows from operating activities/average total assets
  Cash flows from operating activities / average stockholders' equity
- Free cash flow: Cash flows from operating activities–dividends + sales of capital assets–purchases of capital assets.
  (In the analysis, to adjust for size of company, free cash flow was divided by average total assets.)

Operating Asset and Financing Ratios

- Receivables turnover: Net sales/average accounts receivable
- Average days' uncollected: 365/receivables turnover
- Inventory turnover: Cost of sales / average accounts inventory
- Average days' inventory on hand: 365/inventory turnover
- Payables turnover: (Cost of sales + or– change in inventory) / average accounts payable
- Average days' payable: 365/payables turnover
- Financing period: Average days' sales uncollected + average days' inventory on hand–average days' payable.

Appendix D: Industry Composition of the Global MSCI Index–2009

Industry Group	Quantity of companies	Industry description
13	42	Oil and gas companies
15	32	General building contractors
16	18	Heavy construction
20	70	Food and kindred products
26	21	Papers and allied products
27	26	Miscellaneous publishing and printing
28	109	Miscellaneous chemical and allied products, pharmaceutical preparations
29	23	Petroleum refining
32	21	Glass, cement, clay, concrete, and other nonmetallic mineral products
33	34	Primary metal industries (still works, refining of nonferrous metals, nonferrous foundries, drawing and insulating of nonferrous wire, miscellaneous metal products)
34	18	Metal cans, general hardware, heating equipment, miscellaneous fabricated metal products
35	92	Miscellaneous industrial and commercial machinery and equipment, engines and turbines, computer and office equipment
36	94	Electronic and other electrical equipment, household appliances and equipment, communications equipment, electronic components and semiconductors
37	55	Aircrafts, motor vehicles, motorcycles and parts, ship building
38	63	Detection and navigation systems, miscellaneous instruments and apparatus, photographic equipment and supplies
44	16	Water transportation
45	18	Air transportation, airports
48	71	Radiotelephone and telephone communications, television stations and services
49	84	Electric, gas and sanitary services, water supply
50	24	Wholesale–miscellaneous durable goods
53	17	Retail–department, variety and general merchandise stores
54	17	Retail–food, grocery and convenience stores
56	16	Retail–apparel and accessory, clothing and shoe stores
59	16	Retail–drug stores, jewelry stores, catalog and mail–order stores, miscellaneous retail stores

60	32	Banks, savings institutions, and functions related to depository banking
63	37	Insurance companies
67	25	Real estate investment trusts, investors
73	91	Miscellaneous business and information services, computer programming services, prepackaged software
79	18	Miscellaneous amusement and recreation services
87	15	Miscellaneous engineering, accounting, research, management services
99	15	Nonclassifiable establishments
Other	250	
Total	1480	
Industries shown have more than 14 companies and represent at least 1% of the sample		

Appendix E: Country Composition of the Global MSCI Index–2009

Country code	Country	Quantity of companies
AUS	AUSTRALIA	53
AUT	AUSTRIA	11
BEL	BELGIUM	15
BMU	BERMUDA	3
CHE	SWITZERLAND	29
CHN	CHINA	4
DEU	GERMANY	39
DNK	DENMARK	16
ESP	SPAIN	25
FIN	FINLAND	21
FRA	FRANCE	52
GBR	UNITED KINGDOM	107
GIB	GIBRALTAR	1
GRC	GREECE	11
HKG	HONG KONG	26
IRL	IRELAND	14
ITA	ITALY	18
JPN	JAPAN	316
NLD	NETHERLANDS	21
NOR	NORWAY	17
NZL	NEW ZEALAND	7

PRT	PORTUGAL	8
SGP	SINGAPORE	21
SWE	SWEDEN	35
USA	UNITED STATES	610
Total		1480

Appendix F: Distribution of HPC by Country for Each Ten–Year Period–MSCI World

Country	10-year periods												
	88–97	89–98	90–99	91–00	92–01	93–02	94–03	95–04	96–05	97–06	98–07	99–08	00–09
AUS							1		1	4	5	5	2
BEL										1	1	1	
CAN			1			1	2	2	1	2	3		4
CHE							1				3	5	6
DEU						1	1	1					
DNK								1	1	1	1	1	1
ESP							1	1	1		1	1	
FIN							1		1		1		
FRA	1		1	2	3	4	3	1	1		1	1	3
GBR	1	3	3	4	6	8	7	9	11	9	7	5	6
GRC													1
HKG											1	2	2
IRL									2	2	1		1
JPN	1	1	1		1				1	1	1	1	
NLD													1

NOR											1	
SGP		1	1		2	1	1	1				
SWE								1	1	1	1	1	1
USA	10	11	12	23	30	38	38	49	63	56	89	75	85
Total	13	16	19	29	42	53	56	66	84	77	116	99	113

Appendix G: High Performance Companies in Three Ten–Year Periods: 98–07, 99–08, and 00–09

98–07		99–08		00–09	
Company name	Country	Company name	Country	Company name	Country
ABERCROMBIE & FITCH–CL A	USA	ADOBE SYSTEMS INC	USA	ABBOTT LABOR-ATORIES	USA
ADOBE SYSTEMS INC	USA	ALLERGAN INC	USA	ADOBE SYSTEMS INC	USA
AFLAC INC	USA	AMERISOURCE-BERGEN CORP	USA	ALLERGAN INC	USA
ALLERGAN INC	USA	AMGEN INC	USA	ALLIANCE DATA SYSTEMS CORP	USA
AMERISOURCE-BERGEN CORP	USA	AMPHENOL CORP	USA	AMERIGROUP CORP	USA
AMGEN INC	USA	ANSYS INC	USA	AMERISOURCE-BERGEN CORP	USA
AMPHENOL CORP	USA	APOLLO GROUP INC–CL A	USA	AMPHENOL CORP	USA
ANSYS INC	USA	ARTHUR J GALLA-GHER & CO	USA	AMSURG CORP	USA
APOLLO GROUP INC–CL A	USA	ASX LIMITED	AUS	ANSYS INC	USA
ARTHUR J GALLA-GHER & CO	USA	BARD (C.R.) INC	USA	APOLLO GROUP INC–CL A	USA
AUTOZONE INC	USA	BLOCK H & R INC	USA	ARTHUR J GALLAGHER & CO	USA
AVON PRODUCTS	USA	BRITISH AMERIC-AN TOBACCO P.L.C.	GBR	ASX LIMITED	AUS
BARD (C.R.) INC	USA	BROWN & BROWN INC	USA	AVON PRODUCTS	USA

BED BATH & BEYOND INC	USA	BUNZL PUBLIC LIMITED COMPANY	GBR	BARD (C.R.) INC	USA
BELLWAY P.L.C.	GBR	C H ROBINSON WORLDWIDE INC	USA	BROWN & BROWN INC	USA
BEST BUY CO INC	USA	CACI INTL INC–CL A	USA	BUNZL PUBLIC LIMITED COMPANY	GBR
BOVIS HOMES GROUP PLC	GBR	CAPITA GROUP PLC (THE)	GBR	C H ROBINSON WORLDWIDE INC	USA
BROWN & BROWN INC	USA	CHATTEM INC	USA	CACI INTL INC–CL A	USA
BROWN~FORMAN~CL B	USA	CHURCH & DWIGHT INC	USA	CAPITA GROUP PLC (THE)	GBR
BUNZL PUBLIC LIMITED COMPANY	GBR	COCHLEAR LIMITED	AUS	CENTENE CORP	USA
C H ROBINSON WORLDWIDE INC	USA	COGNIZANT TECH SOLUTIONS	USA	CHURCH & DWIGHT INC	USA
CACI INTL INC–CL A	USA	COLRUYT	BEL	COACH INC	USA
CAPITA GROUP PLC (THE)	GBR	COMPUTERSHARE LIMITED	AUS	COCHLEAR LIMITED	AUS
CATHAY GENERAL BANCORP	USA	COPART INC	USA	COGNIZANT TECH SOLUTIONS	USA
CHATTEM INC	USA	COVENTRY HEALTH CARE INC	USA	COPART INC	USA
COCHLEAR LIMITED	AUS	CULLEN/FROST BANKERS INC	USA	COVENTRY HEALTH CARE INC	USA
COGNIZANT TECH SOLUTIONS	USA	DANAHER CORP	USA	DANAHER CORP	USA
COLRUYT	BEL	DENTSPLY INTERNATL INC	USA	DANONE	FRA
COMPUTERSHARE LIMITED	AUS	EATON VANCE CORP	USA	DAVITA INC	USA
COPART INC	USA	ECOLAB INC	USA	DENTSPLY INTERNATL INC	USA
CORPORATE EXECUTIVE BRD CO	USA	ESPRIT HOLDINGS LIMITED	HKG	DIONEX CORP	USA
COVENTRY HEALTH CARE INC	USA	EXPEDITORS INTL WASH INC	USA	EATON VANCE CORP	USA

DANAHER CORP	USA	FACTSET RESEARCH SYSTEMS INC	USA	ECOLAB INC	USA
DENTSPLY INTERNATL INC	USA	FASTENAL CO	USA	ENDO PHARMA-CEUTICALS HLDGS	USA
DIONEX CORP	USA	FISERV INC	USA	EQUIFAX INC	USA
DONALDSON CO INC	USA	FOREST LABORAT-ORIES–CL A	USA	ESPRIT HOLDINGS LIMITED	HKG
EAST WEST BANCORP INC	USA	FRANKLIN RESOURCES INC	USA	EXPEDITORS INTL WASH INC	USA
EATON VANCE CORP	USA	GENERAL DYNAM-ICS CORP	USA	FACTSET RESEARCH SYSTEMS INC	USA
EBAY INC	USA	GENERAL MILLS INC	USA	FASTENAL CO	USA
ECOLAB INC	USA	GENZYME CORP	USA	FISERV INC	USA
EXPEDITORS INTL WASH INC	USA	GLOBAL PAYMENTS INC	USA	FOREST LABORAT-ORIES–CL A	USA
FACTSET RESEARCH SYSTEMS INC	USA	GRACO INC	USA	FORTUNE BRANDS INC	USA
FASTENAL CO	USA	H & M HENNES & MAURITZ AB	SWE	FRANKLIN RESOURCES INC	USA
FEDERATED INVESTORS INC	USA	HANSEN NATURAL CORP	USA	GAMESTOP CORP	USA
FISERV INC	USA	HENRY (JACK) & AS-SOCIATES	USA	GARMIN LTD	USA
FOREST LABORAT-ORIES–CL A	USA	HERMES INTERNA-TIONAL SCA	FRA	GEBERIT AG	CHE
FORWARD AIR CORP	USA	IDEX CORP	USA	GENERAL DYNAMICS CORP	USA
FOSSIL INC	USA	IMPERIAL TOBACCO GROUP PLC	GBR	GENZYME CORP	USA
GEBERIT AG	CHE	INDRA SISTEMAS	ESP	GRACO INC	USA
GENERAL DYNAMICS CORP	USA	INTL GAME TECHNOLOGY	USA	GREAT–WEST LIFECO INC	CAN
GENZYME CORP	USA	INTUIT INC	USA	H & M HENNES & MAURITZ AB	SWE
GRACO INC	USA	ITT EDUCATIONAL SERVICES INC	USA	HANSEN NATURAL CORP	USA
GREAT–WEST LIFECO INC	CAN	JACOBS ENGINEER-ING GROUP INC	USA	HENRY (JACK) & ASSOCIATES	USA

H & M HENNES & MAURITZ AB	SWE	JOHNSON & JOHNSON	USA	HERMES INTERNATIONAL SCA	FRA
HAIN CELESTIAL GROUP INC	USA	KELLOGG CO	USA	IDEX CORP	USA
HANSEN NATURAL CORP	USA	L–3 COMMUNICATIONS HLDGS INC	USA	IDEXX LABS INC	USA
HARLEY–DAVIDSON INC	USA	LANDSTAR SYSTEM INC	USA	IGM FINANCIAL INC	CAN
HARVEY NORMAN HOLDINGS LIMITED	AUS	LI & FUNG LIMITED	HKG	IMPERIAL TOBACCO GROUP PLC	GBR
HENRY (JACK) & ASSOCIATES	USA	MATTHEWS INTL CORP–CL A	USA	INTERTEK GROUP PLC	GBR
HERMES INTERNATIONAL SCA	FRA	MCCORMICK & CO INC	USA	INTL GAME TECHNOLOGY	USA
HOYA CORPORATION(C)	JPN	MEGGITT P.L.C.	GBR	ITT EDUCATIONAL SERVICES INC	USA
IMPERIAL TOBACCO GROUP PLC	GBR	MOODY'S CORP	USA	JACOBS ENGINEERING GROUP INC	USA
INTL GAME TECHNOLOGY	USA	NESTLE S.A.	CHE	JOHNSON & JOHNSON	USA
INVESTMENT TECHNOLOGY GP INC	USA	NIKE INC	USA	KELLOGG CO	USA
ITT EDUCATIONAL SERVICES INC	USA	NOBEL BIOCARE HOLDING AG	CHE	L–3 COMMUNICATIONS HLDGS INC	USA
KINGSPAN GROUP PLC	IRL	ORACLE CORP	USA	LABORATORY CP OF AMER HLDGS	USA
KNIGHT TRANSPORTATION INC	USA	OSHKOSH CORP	USA	LI & FUNG LIMITED	HKG
L–3 COMMUNICATIONS HLDGS INC	USA	PATTERSON COMPANIES INC	USA	LINCARE HOLDINGS INC	USA
LEGG MASON INC	USA	PERPETUAL LIMITED	AUS	MATTHEWS INTL CORP–CL A	USA
LI & FUNG LIMITED	HKG	PHARMACEUTICAL PROD DEV INC	USA	MCCORMICK & CO INC	USA
MCCORMICK & CO INC	USA	POLO RALPH LAUREN CP–CL A	USA	MEDNAX INC	USA

MEDNAX INC	USA	PRICE (T. ROWE) GROUP	USA	MEGGITT P.L.C.	GBR
NESTLE S.A.	CHE	PROCTER & GAMBLE CO	USA	MOODY'S CORP	USA
NEXT PLC	GBR	PROSPERITY BANC-SHARES INC	USA	NESTLE S.A.	CHE
NIKE INC	USA	QLOGIC CORP	USA	NOBEL BIOCARE HOLDING AG	CHE
NOKIA CORPORATION	FIN	ROPER INDUSTRIES INC/DE	USA	OPAP S.A.	GRC
NVIDIA CORP	USA	SCHEIN (HENRY) INC	USA	OSHKOSH CORP	USA
NVR INC	USA	SEI INVESTMENTS CO	USA	PADDY POWER PLC	IRL
ORACLE CORP	USA	SONIC HEALTHCARE LIMITED	AUS	PEPSICO INC	USA
OSHKOSH CORP	USA	SONOVA HOLDING AG	CHE	PHARMACEUTICAL PROD DEV INC	USA
PATTERSON COMPANIES INC	USA	ST JUDE MEDICAL INC	USA	POWER CORP CANADA	CAN
PERPETUAL LIMITED	AUS	STRAUMANN HOLD-ING AG	CHE	POWER FINANCIAL CORP	CAN
POLARIS INDUSTRIES INC	USA	STRAYER EDUCA-TION INC	USA	PRECISION CAST-PARTS CORP	USA
POOL CORP	USA	STRYKER CORP	USA	PRICE (T. ROWE) GROUP	USA
POWER FINANCIAL CORP	CAN	SYMANTEC CORP	USA	PROSPERITY BANC-SHARES INC	USA
PRICE (T. ROWE) GROUP	USA	SYNTHES INCORPOR-ATED	CHE	QUEST DIA-GNOSTICS INC	USA
QLOGIC CORP	USA	SYSCO CORP	USA	ROPER INDUSTRIES INC/DE	USA
REPUBLIC SERVICES INC	USA	TANDBERG ASA	NOR	SANOFI–AVENTIS	FRA
RESMED INC	USA	TECHNE CORP	USA	SCHEIN (HENRY) INC	USA
ROPER INDUSTRIES INC/DE	USA	THOR INDUSTRIES INC	USA	SEI INVESTMENTS CO	USA
SAPUTO INC	CAN	TREND MICRO IN-CORPORATED(C)	JPN	SONOVA HOLDING AG	CHE

SCOTTS MIRACLE –GRO CO	USA	UNITED TECHNOLO-GIES CORP	USA	ST JUDE MEDICAL INC	USA
SEI INVESTMENTS CO	USA	UNITEDHEALTH GROUP INC	USA	STAPLES INC	USA
SIGMA–ALDRICH CORP	USA	VCA ANTECH INC	USA	STERICYCLE INC	USA
SIMPSON MANUFAC-TURING INC	USA	WATERS CORP	USA	STRAUMANN HOLD-ING AG	CHE
SMITH & NEPHEW PLC	GBR	WILEY (JOHN) & SONS–CL A	USA	STRAYER EDUCA-TION INC	USA
SONIC CORP	USA	WILLIAM DEMANT HOLDING	DNK	STRYKER CORP	USA
SONIC HEALTHCARE LIMITED	AUS	WORLD ACCEPT-ANCE CORP/DE	USA	SYMANTEC CORP	USA
ST JUDE MEDICAL INC	USA	ZEBRA TECHNOLO-GIES CP–CL A	USA	SYNTHES INCORPORATED	CHE
STATE STREET CORP	USA			SYSCO CORP	USA
STRAUMANN HOLD-ING AG	CHE			TECHNE CORP	USA
STRAYER EDUCATION INC	USA			TRIMBLE NAVIGA-TION LTD	USA
STRYKER CORP	USA			UNILEVER N.V.	NLD
SYMANTEC CORP	USA			UNILEVER PLC	GBR
SYSCO CORP	USA			UNITED TECHNOLO-GIES CORP	USA
TARGET CORP	USA			UNITEDHEALTH GROUP INC	USA
TECHNE CORP	USA			VARIAN MEDICAL SYSTEMS INC	USA
THOR INDUSTRIES INC	USA			VCA ANTECH INC	USA
UNITED TECHNOLO-GIES CORP	USA			WADDELL & REED FINL INC–CL A	USA
UNITEDHEALTH GROUP INC	USA			WATERS CORP	USA
VCA ANTECH INC	USA			WD–40 CO	USA
WADDELL&REED FINL INC–CL A	USA			WILLIAM DEMANT HOLDING	DNK

WATERS CORP	USA			ZIMMER HOLDINGS INC	USA
WILEY (JOHN) & SONS–CL A	USA				
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Intellectually, the journal takes three steps: the first is a "this-worldly" step, mapping the details and extrapolating to big picture analyses in order to interpret what is at times challenging, dangerous and excitingly positive about the "New Globalization". The second step is to set this New Globalization in the context of earlier globalizations – what are the continuities, and what is genuinely new? The third step is to re-examine and redefine the very concept of globalization – in theoretical, anthropological and philosophical terms. The journal works between fastidiously empirical and profoundly generalizing modes of engagement, analyzing one of the central phenomena of our contemporary existence.

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