

# ERP Systems Business Value: A Critical Review of Empirical Literature

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**Abstract:** The business value generated by information and communication technologies (ICT) has been for long time a major research topic of high interest to both researchers and practitioners. Recently there is a growing research interest in the business value generated by particular types of information systems (IS). One of them is the Enterprise Resource Planning (ERP) systems, which are increasingly adopted by organizations for supporting and integrating key business and management processes within and beyond their boundaries. The current paper initially presents a critical review of the existing empirical literature concerning the business value of the ERP systems, which investigates the impact of ERP systems adoption on various measures of organizational performance. Then is critically reviewed the literature concerning the related topic of critical success factors (CSFs) in ERP systems implementation, which aims at identifying and investigating factors that result in more successful ERP systems implementation that generate higher levels of value for organizations. Finally, based on the conclusions of the above literature reviews, future directions of research concerning ERP systems business value are proposed.

*Index Terms*— Enterprise Resource Planning (ERP), Business Value, Critical Success Factor (CSF), Business Performance.

## I. INTRODUCTION

Organizations have been making for more than two decades big investments in information and communication technologies (ICT) aiming at the development of various types of information systems (IS) that support important business functions and processes of them. So a critical issue that is posed to both researchers and practitioners is to understand and assess the business value generated by these ICT investments and to find ways of increasing it. For this reason the business value generated by ICT has been for long time a major research topic. This ICT business value research can be divided into four periods. In the first period (from the mid 1980s until the mid 1990s) there has been very little empirical evidence of a positive association between ICT investment and business performance (Roach 1987, Brynjolfsson 1993, Strassman 1997); these counter-intuitive results lead to extensive debates about this ‘ICT Productivity Paradox’ (Brynjolfsson 1993) and the basic reasons behind it. In the second period (from the mid 1990s until the mid 2000s) there have been mixed results: some studies provided empirical evidence of positive contribution of ICT investment to some business performance measures (Brynjolfsson and Hitt 1996, Stolarick 1999, OECD 2004, Arvanitis 2005), even though there are still some other studies resulting in mixed or inconclusive results. In the third period (from 2000 until today) research focuses on the identification and deeper understanding of ‘internal’ factors (related to the internal functions of the organization), which can increase the business value generated by ICT, such as business process redesign, new human skills, innovations, ‘soft ICT investment’, etc. (Devaraj & Kohli 2000, Arvanitis 2005, Hempell 2005,

Loukis et al 2008a). Finally in the fourth period (from 2005 until today) research starts dealing with the effect of ‘external’ factors, which are related to the external environment of the organization, such as generalized competition, strategy, industry concentration, industry dynamism, etc. on ICT business value (Melville et al 2007, Loukis et al 2008b).

Recently there is a growing research interest in the business value generated by particular types of (IS), such as e-business systems (Zhu 2004, Zhu & Kraemer 2005, Soto-Acosta & Merono-Cerdan 2008), Enterprise Resource Planning (ERP) systems (Poston and Grabski 2001, Hunton et al 2003, Nicolaou 2004, Hendricks et al. 2006), etc. The current paper presents a critical review of the existing empirical literature concerning the business value generated by the ERP systems, which investigates the impact of ERP systems adoption on various measures of organizational performance.

ERP systems are increasingly adopted in the last decade by organizations for supporting and integrating key business and management processes within and beyond their boundaries. According to Holland et al. (1999) ERP systems are defined as highly integrated enterprise-wide standard IS (software packages) that automate core corporate activities (business processes) such as finance, human resources, manufacturing, supply and distribution. Nah et al. (2001) define an ERP system as a packaged business software system that enables a company to manage the efficient and effective use of its resources (materials, human resources, finance, etc.) by supporting a process-oriented view of the business and providing a total, integrated solution for the organization’s information-processing needs.

The basic goal of an ERP is to support and integrate all business functions, processes and units of an organization and to create a system that is capable of providing up – to – date and relevant information to the decision makers, the employees and also the business partners. However, ERP

systems are characterized by high level of costs and complexity. The high investment that is required and the decision to purchase and implement an ERP is one of the most important decisions management has to make (Beheshti 2006). Shehab et al (2004) emphasize that ERP projects are large, costly and difficult, however 'there is no guarantee of the outcome'; they argue that various types of ERP systems misfits (i.e. gaps between the functionality offered by an ERP and that required by the adopting organization), such as data, process and output misfit, can reduce significantly the benefits offered by an ERP system to the adopting organization. The inherent complexity of ERP systems is analyzed by Marnewick & Labuschagn (2005), who argue that an ERP system is divided into four major components: software, customer mindset, change management, and flow of processes within the organization; they also propose as a fifth component the ERP implementation methodology, which integrates these four components.

For these reasons it is necessary to investigate empirically the business value generated by ERP systems in the 'real life' of the organizations adopting them, and also to identify and understand the main 'internal' and 'external' factors that affect this business value, so that we can propose ways of increasing it. In this direction in the following section 2 of this paper is briefly presented a critical review of the existing empirical literature concerning the business value of the ERP systems, which investigates the impact of ERP systems adoption on various measures of organizational performance. Then in section 3 is briefly reviewed the literature concerning the related topic of the critical success factors (CSFs) in ERP systems implementation, which aims at investigating factors that result in more successful ERP systems implementation that generate higher levels of value for organizations. Finally in section 4 the conclusions of the above literature reviews are outlined and future directions of research concerning ERP systems business value are proposed.

## II. IMPACT OF ERP ON BUSINESS PERFORMANCE

The main empirical studies that have been conducted concerning the business value of the ERP systems and their conclusions are shown in the Appendix. These studies examine the impact of ERP adoption on various financial and non-financial measures of performance, most of them at the organization level.

In the first of these studies Poston & Grabski (2001) examined the effect of ERP systems on firm performance over a 3-year period by comparing basic financial performance indices of 50 ERP adopters before ERP implementation and for three years after it. The results show a statistically significant decrease only in the ratio of cost of goods sold (COGS) to revenues three years after the ERP system implementation (but not in the first or second year after implementation). On the other hand they found no significant improvement in the ratio of selling, general and administrative

expenses (SG&A) to revenues and also in the residual income. Also there was a significant reduction in the ratio of employees to revenues for each of the three years after the ERP implement Hence, they suggested a contradiction: while ERP systems appear to yield efficiency gains in some areas, e.g. in reducing cost-to-revenue, they cause some increases elsewhere, so they leave residual income unaffected.

Hitt et al (2002) using multiyear multi-firm ERP implementation and financial data concluded that firms that invest in ERP tend to show higher business performance in several financial performance indices, though there is a slowdown in business performance and productivity shortly after the implementation. Concerning stock value they found that financial markets reward the adopters with higher market valuation as measured by Tobin's q. Another interesting conclusion is that higher level of ERP (i.e. implementation of more ERP modules) is associated with higher business performance, but only up to an optimal level, while exceeding this level results in declining benefits; this provides some evidences that the broadest ERP implementation faces diseconomies of scale.

Hunton et al (2003) examined the longitudinal impact of ERP adoption on firm performance by matching and comparing 62 firms that have adopted ERP systems with peers that had not adopted ERP systems. Results indicated that return on assets (ROA), return on investment (ROI), and asset turnover (ATO) were significantly better over a 3-year period for adopters as compared to the non-adopters. Also, they found that these significant differences arise because the financial performance decreased over time for the non-adopters, while it remained steady for the adopters. Another interesting finding of this study was a significant interaction between firm size and financial health for ERP adopters with respect to ROA, ROI, and return on sales (ROS); in particular, a positive (negative) relationship was found between financial health and performance for small (large) firms.

Akkermans et al. (2003) presented results from a Delphi study on the future impact of ERP systems on supply chain management (SCM). The Delphi study was conducted with 23 Dutch supply chain executives of European multi-nationals. Initially these executives identified the following key SCM issues for the coming years: 1) higher integration of activities between suppliers and customers across the entire supply chain, 2) changes in supply chain needs and required flexibility from IT, 3) more mass customization of products and services leading to increasing assortments while decreasing cycle times and inventories, 4) the locus of the driver's seat of the entire supply chain and 5) bigger supply chains consisting of several independent enterprises. With regard to ERP systems the panel experts saw only a modest role for ERP in improving future supply chain effectiveness and a clear risk of ERP actually limiting progress in SCM. ERP was seen as offering a positive contribution to only 4 of the top 12 future supply chain issues: more customization of products and services; more standardized processes and information; the need for worldwide ICT systems; and greater

transparency of the marketplace.

In order to examine the effect of adoption of ERP systems on a firm's long-term financial performance Nicolaou (2004) compares financial data of 247 firms adopting ERP systems with a matched control group of firms before and after adoption. The results show that firms adopting enterprise systems exhibit higher differential financial performance (i.e. in comparison with 'similar' firms non-adopters) only after two years of continued ERP use, while in the year of completion and the following one there is negative differential impact (i.e. show lower financial performance than 'similar' firms non-adopters). Another interesting finding of this study is that implementing a system from a larger vendor, having system-led objectives, and implementing some particular types of modules increase the positive impact of ERP systems on financial performance in comparison to firms following a different implementation strategy.

Two years later Nicolaou & Bhattacharya (2006) examined the effects of various types of ERP system changes (e.g. enhancements, upgrades, abandonments, switches) in firms that have previously adopted ERP systems on the impact of ERP on long-term financial performance. Two research hypotheses have been developed in this study, which posit that both the nature and the timing of system changes affect the extent of ERP post – implementation success. The empirical results provide support to these hypotheses: ERP-adopting firms, which initiate early enhancements in the form of either add-ons or upgrades, exhibit higher differential financial performance in comparison to other ERP-adopting firms' differential performance. These changes seem to resolve implementation problems, based on the experience gained during the first period of usage, so they affect positively the subsequent level of ERP success. On the contrary it was found that late enhancements and both early and late abandonments lead to differential performance deterioration in comparison to other ERP-adopting.

Hendricks et al. (2006) examined the effect of firms' investments in Enterprise Resource Planning (ERP), Supply Chain Management (SCM), and Customer Relationship Management (CRM) systems on long-term stock price performance and various profitability measures, such as return on assets and return on sales. Their results provide evidence that the adoption ERP systems leads to significant improvements in the profitability, which are stronger in the case of early adopters of ERP systems, but not in the stock returns. Also, the adopters of SCM systems experience positive stock returns as well as improvements in profitability. On the contrary, there was no evidence of improvements in stock returns or profitability for firms that have invested in CRM.

Further insights into the effects of ERP systems adoption on performance, both at the firm level and at the business process level, is provided by the empirical study conducted by Wieder et al. (2006), which was based on data on several aspects of organizational performance collected through a survey from companies that adopted ERP systems and/or SCM systems

and the respective control groups. Basic financial key performance indicators were used in order to measure overall firm performance, while for operationalising performance at the business process (supply chain) level was used the 'supply-chain operations reference model' (SCOR-model) published by the Supply Chain Council ([www.supply-chain.org](http://www.supply-chain.org)). As independent variables they used ERPS systems adoption, ERP systems history and ERP system extension with a SCM system. The key results contradict the claims of ERP systems vendors, since no significant performance differences were found between ERP adopters and non-adopters, either at the business process level, or at the overall firm level. It was also found that the longer the experience of firms with ERP systems, the higher their overall performance, though no evidence was found of a similar effect on business process (supply chain) performance. Only those ERPS adopters that also adopted SCM systems achieved significantly higher performance at the business process level.

Wier et al. (2007) investigated empirically whether the joint adoption of an ERP system and the inclusion of non-financial performance indicators (NFPI) in executive compensation contracts significantly enhances business performance (measured by the return on assets (ROA) and the return on stocks (ROS)) as compared to either of them alone. For this purpose they used a sample consisting of three types of firms: ERP-only, NFPI-only and ERP-NFPI. The results indicate that the combined use of ERP and NFPI leads to significantly higher short-term and long-term ROA and SR than the use of each of them alone (in the ERP-only or the NFPI-only firms). From these results it can be concluded that ERP and NFPI are complementary organizational strategies, so the impact of ERP on business performance can be increased if it is combined with NFPI.

### III. CFSS IN ERP SYSTEMS IMPLEMENTATION

The big difficulties, problems and risks experienced by firms implementing ERP systems have motivated extensive research for identifying the critical success factors (CSFs) of ERP systems implementation. This research stream is related to the above research stream on the business value generated by the ERP systems (presented in the previous section II), since it identifies and investigates factors, and therefore courses of action, which can increase the business value that ERP systems generate. Many articles have been published concerning ERP implementation CSFs and a more detailed review of them provided by Shehab et al (2004), Botta-Genoulaz et al (2005) and Moon (2007). In the following paragraphs of this section the most important of them are reviewed, while in the final conclusions section it is explained how the findings of this research stream (i.e. the identified CSFs of ERP implementation) can be incorporated and exploited in the ERP systems business value research.

Cantu (1999) created an ERP implementation framework based on five CSFs, each of them being further analyzed into

a number of attributes, reaching a total of 22 attributes. The CSFs he proposed and their attributes were: Management and Organization (Commitment, Education, Involvement, Project team selection, Training, Roles and responsibility), Process (Alignment, Documentation, Integration, Process redesign), Technology (Hardware, Software, Systems management, Interface), Data (Master files, Transaction files, Data structure, Maintenance and Integrity), People (Education, Training, Skills development, Knowledge management).

Based on a set of previous relevant studies, which produced lists of CSFs in ERP implementations, Esteves and Pastor (2000) unified these lists and created a CSFs unified model. The model included: Strategic – Organizational factors (Sustained management support, Effective organizational change management, Good project scope management, Adequate project team composition, Comprehensive business process reengineering, Adequate project champion role, User involvement and participation, Trust between partners), Tactical - Organizational factors (Dedicated staff and consultants, Strong communication inwards and outwards, Formalized project plan/schedule, Adequate training program, Preventive trouble shooting, Appropriate usage of consultants, Empowered decision-makers), Strategic Technological factors (Adequate ERP implementation strategy, Avoid customization, Adequate ERP version) and Tactical Technological (Adequate infrastructure and interfaces, Legacy systems knowledge, Formalized testing plan, Adequate data migration process). This study also concluded that while both the organizational and the technological perspectives are essential for a successful ERP implementation project, their importance shifts as the project moves through its lifecycle.

Nah (2001), by synthesizing a number of articles on the key critical factors for ERP implementation success, developed a unified framework including the following eleven basic CSFs: ERP teamwork and composition, Change management program and culture, Top management support, Business plan and vision, Effective communications, Project management, Software development, testing and trouble shooting, Monitoring and evaluation of performance, Project champion and Appropriate business and IT legacy systems.

According to Umble & Umble (2003) the main CFSs for ERP implementation are: clear understanding of strategic goals, commitment by top management, good project management, organizational change management, good implementation team, data accuracy, extensive education and training, focused performance measures and appropriate management of multi – site issues.

Sun et al. (2005), based on ‘real-life’ data, converted CSFs into quantitative information to reflect measurements including cost, schedule and goal achievement that must be addressed during implementations, and concluded that all CFSs are not equally important. They developed a CSFs framework around ‘people’, ‘data’, ‘process’, ‘management/organization’ and ‘technology’, suggesting that most of the emphasis should be placed on the ‘people’-related factor.

#### IV. CONCLUSION

Organizations have made big investments in the ERP systems expecting various types of benefits from them; some of these investments have resulted in success stories, but some others in failures, as reported by the relevant literature. It is therefore necessary to investigate empirically, based on large datasets, to what extent ERP systems in ‘real life’ offer these benefits to the organizations that adopted them, and in general to assess and understand the business value ERP systems generate. Also it is necessary to identify and understand the main ‘internal’ and ‘external’ factors that affect this business value, so that we can propose ways of increasing it.

From a critical review of the literature on this topic it is concluded that some empirical studies have been conducted concerning the impact of ERP systems on business performance with mixed results. Some of these studies provided evidence of positive impact of ERP systems on some measures of business performance; however, some other studies did not find a statistically significant effect of ERP systems on important measures of business performance. For explaining these mixed results useful can be the knowledge gained from the four periods of the ICT business value research, which have been outlined in the introductory section of this paper. Based on this knowledge, possible explanations of these mixed results are: 1) The ERP stakeholders (ERP vendors, consultants and adopting organizations) have not yet reached a high level of expertise and maturity in implementing ERP systems, adapting them to a particular organization and redesigning business processes; there are big differences in this expertise and maturity between different ERP vendors, consultants, adopting organizations, regions and industries 2) In the models, which have been constructed by previous studies for investigating the association between various business performance measures (used as dependent variables) and ERP adoption (used as independent variable), some important independent variables are omitted, which correspond to factors associated with the internal context, the implementation strategy and the external context, that affect ERP implementation success and benefits; such factors have been identified by the research that has been conducted concerning the CFSs of ERP implementation, which has been briefly reviewed in section III.

Therefore, taking into account the knowledge gained from the third and the fourth period of the ICT business value research, a convergence of the above two research streams, on the impact of ERP on business performance (section II) and on the CSFs of ERP implementation (section III), is necessary. In this direction further research on ERP business value and impact on business performance is required, in various national and sectoral contexts, which incorporates identified CSFs of ERP implementation, focusing on the identification and understanding of factors associated with the internal context, the implementation strategy and the external context that affect the business value generated by ERP systems.

## REFERENCES

- [1] Akkermans, H. A., Bogerd, P., Yucesan, E., Wassenhove, L. N. "The impact of ERP on supply chain management: Exploratory findings from a European Delphi study". *European Journal of Operational Research*, 2003, vol. 146, pp. 284–301.
- [2] Arvanitis, S. "Computerization, Workplace Organization, Skilled Labour and Firm Productivity: Evidence for the Swiss Business Sector". *Economics of Innovation and New Technology*, 2005, 14(4), pp. 225-249.
- [3] Beheshti, H.M. "What managers should know about ERP / ERP II," *Management Research News*, vol. 29, pp. 184-193, 2006.
- [4] Botta-Genoulaz, V., Millet, P. A., Grabot, B. "A survey of the recent literature on ERP systems". *Computers in Industry*, vol. 56, 2005, pp. 510-522.
- [5] Brynjolfsson, E. "The productivity paradox of information technology: review and assessment". *Communications of the ACM*, 36(12), 1993, pp. 67-77.
- [6] Brynjolfsson, E., Hitt, L. M. "Paradox lost? Firm level evidence on the returns to information systems spending". *Management Science*, 42(4), 1996, pp. 541–558.
- [7] Cantu, R. "A framework for implementing enterprise resource planning systems in small manufacturing companies". Master's Thesis, St. Mary's University, San Antonio, 1999.
- [8] Devaraj, S., Kohli, R. "Information Technology Payoff in the Health-Care Industry: A Longitudinal Study". *Journal of Management Information Systems*, 16 (4), 2000, pp. 41-65.
- [9] Esteves, J., Pastor, J. "Towards the Unification of Critical Success Factors for ERP Implementations". 10th Annual BIT Conference, 2000.
- [10] Hendricks, K. B., Singhal, V. R., Stratman, J. K. "The impact of enterprise systems on corporate performance: A study of ERP, SCM, and CRM system implementations". *Journal of Operations Management*, 2006, vol. 25, pp. 65–82.
- [11] Hitt, L. M., Wu, D. J., Zhou, X. "Investment in Enterprise Resource Planning: Business Impact and Productivity Measures". *Journal of Management Information Systems*, 2002, vol. 19, no. 1, pp. 71–98.
- [12] Holland, C. P, Light, B., Gibson, N. "A critical success factors model for enterprise resource planning implementation". In *Proceedings of the 7th European Conference on Information Systems*, Copenhagen, Denmark: Copenhagen Business School, 1999, pp. 273- 287.
- [13] Holland, P., Light, B., Kawalek, P. "Beyond enterprise resource planning projects". In *Proceedings of the 7th European Conference on Information Systems*. Copenhagen, Denmark: Copenhagen Business School, 1999, p.273.
- [14] Hunton, J. E., Lippincott, B., Reck, J. L. "Enterprise resource planning systems: comparing firm performance of adopters and non-adopters". *International Journal of Accounting Information Systems*, vol. 4, 2003, pp. 165–184.
- [15] Loukis, E., Sapounas, I., Aivalis, K. "The Effect of Generalized Competition and Strategy on the Business Value of Information and Communication Technologies" *Journal of Enterprise Information Management*, Vol. 21, No 1, 2008, pp. 13-23.
- [16] Loukis, E., Sapounas, I., Milonias, A. "The effect of hard and soft information and communication technologies investment on manufacturing business performance in Greece - A preliminary econometric study", *Telematics and Informatics* (forthcoming in 2008)
- [17] Marnewick, C., Labuschagne, L. "A conceptual model for enterprise resource planning (ERP)", *Information Management & Computer Security*, Vol. 13, No. 2, 2005, pp. 144 – 155.
- [18] Melville, N., Gurbaxani, V., Kraemer, K. "The productivity impact of information technology across competitive regimes: The role of industry concentration and dynamism", *Decision Support systems*, 43, pp. 229-242.
- [19] Moon, Y. B. "Enterprise Resource Planning: a review of the literature". *International Journal of Management and Enterprise Development*, Vol. 4(3), 2007, pp. 235-264.
- [20] Nah, F. F. H., Lau, J. L. S., Kuang, J. "Critical factors for successful implementation of enterprise systems". *Business Process Management Journal*, 2001, vol. 7, no. 3, pp. 285-296.
- [21] Nicolaou, A. I. "Firm Performance Effects in Relation to the Implementation and Use of Enterprise Resource Planning Systems". *Journal of Information Systems*, 2004, 18(2), pp. 79–105.
- [22] Nicolaou, A. I., Bhattacharya, S. "Organizational performance effects of ERP systems usage: The impact of post-implementation changes". *International Journal of Accounting Information Systems*, 2006, vol. 7, pp. 18– 35.
- [23] Nicolaou, A. I., Reck, J. L. "Firm Performance Effects in Relation to the Implementation and Use of Enterprise Resource Planning Systems". *Journal of Information Systems*, 2004, vol. 18, no. 2, ABI/INFORM Global pg. 79.
- [24] Organisation for Economic Co-operation and Development (OECD). "The Economic Impact of ICT – Measurement, Evidence and Implications". Paris, 2004.
- [25] Poston, R., Grabski, S. "Financial impacts of enterprise resource planning implementations", *Informational Journal of Accounting Information Systems*, 2, 2001, pp. 271 – 294.
- [26] Roach, S. "America's technology dilemma: A profile of the information economy". *Morgan Stanley Special Economic Study*, 1987, New York, USA.
- [27] Shehab, E. M., Sharp, M. W., Supramaniam, L., Spedding, T. A. "Enterprise Resource Planning – An integrative review". *Business Process Management*, 10(4), 2004, pp. 359-386.
- [28] Stolarick, K. "IT Spending and Firm Productivity: Additional Evidence from the Manufacturing Sector". Center for Economic Studies, U.S. Census Bureau, 1999, Working Paper 99-10.
- [29] Soto-Acosta, P., Merono-Cerdan, A. L. "Analyzing e-business value creation from a resource-based perspective". *International Journal of Information Management*, 28, 2008, pp. 49-60.
- [30] Strassman, P. "The Business Value of Computers: An Executive's Guide" The Information Economic Press, 1990, New Canaan, Connecticut.
- [31] Strassman, P. "The Squandered Computer". The Information Economic Press, 1997, New Canaan, Connecticut.
- [32] Sun, A., Yazdani, A., Overend, J. "Achievement assessment for enterprise resource planning (ERP) system implementations based on critical success factors (CSFs)". *International Journal of Production and Economics*, 2005, vol. 98, pp. 189 – 203.
- [33] Umble, E., Umble, M. "Enterprise resource planning: Implementation procedures and critical success factors". *European Journal of Operational Research*, 2003, vol. 146, pp. 241 – 257.
- [34] Wieder, B., Booth, P., Matolcsy, Z. P., Ossimitz, M. L. "The impact of ERP systems on firm and business process performance". *Journal of Enterprise Information Management*, 2006, vol. 19, no. 1, pp. 13-29.
- [35] Wier, B., Hunton, J., HassabElnaby, H. R. "Enterprise resource planning systems and non-financial performance incentives: The joint impact on corporate performance". *International Journal of Accounting Information Systems*, 2007, vol. 8, pp. 165–190
- [36] Zhu, K. "The complementarity of information technology infrastructure and e-commerce capability: A resource-based assessment of their business value". *Journal of Management Information Systems*, 21(1), 2004, pp. 167-202.
- [37] Zhu, K., Kraemer, K. "Post-adoption variations in usage and value of e-business by organizations: Cross-country evidence from the retail industry". *Information Systems Research*, 16(1), 2005, pp. 61-84.

APPENDIX  
EMPIRICAL STUDIES OF IMPACT OF ERP ON PERFORMANCE

Authors	Conclusion
Poston & Grabski (2001)	<ul style="list-style-type: none"> <li>- number of employees/revenues and cost of goods sold/revenues decreased</li> <li>- selling, general and administrative expenses/revenues and residual income show no significant improvement</li> </ul>
Hitt et al (2002)	<ul style="list-style-type: none"> <li>- firms that invest in ERP tend to show higher business performance in several financial performance indices</li> <li>- a reduction in business performance and productivity appears shortly after the ERP implementation was completed</li> </ul>
Hunton et al (2003)	<ul style="list-style-type: none"> <li>- financial performance of ERP adopters is steady, while at the same time non-adopters' financial performance decreases</li> </ul>
Akkermans et al (2003)	<ul style="list-style-type: none"> <li>- ROA, ROI and ATO significantly better for the ERP adopters</li> <li>- ERP systems will play only a modest role in improving future supply chain effectiveness</li> <li>- positive contribution of ERP to only to only 4 of the top 12 future supply chain issues: more customization of products and services; more standardized processes and information; need for worldwide ICT systems; greater transparency of the marketplace</li> <li>- possible risk of ERP actually limiting progress in SCM</li> </ul>
Nicolaou (2004)	<ul style="list-style-type: none"> <li>- firms adopting ERP systems exhibit higher differential performance only after two years of continued ERP use</li> <li>- in the year of completion and IN the following one there is a negative differential impact on performance</li> </ul>
Nicolaou & Bhattacharya (2006)	<ul style="list-style-type: none"> <li>- early enhancements (in the form of either add-ons or upgrades) lead to higher differential financial performance</li> <li>- late enhancements and both early and late abandonments lead to differential performance deterioration</li> </ul>
Hendricks et al (2006)	<ul style="list-style-type: none"> <li>- ERP adopters: improvement in profitability but not in stock returns</li> <li>- SCM adopters: improvement in profitability and positive stock returns</li> <li>- CRM adopters: no improvements in profitability or in stock returns</li> </ul>
Wieder et al (2006)	<ul style="list-style-type: none"> <li>- no significant performance differences were found between ERP adopters and non-adopters, either at the business process level, or at the overall firm level</li> <li>- only those ERP system adopters that also adopted SCM systems achieved significantly higher performance.</li> </ul>
Wier et al (2007)	<ul style="list-style-type: none"> <li>- the combined use of ERP and NFPI leads to significantly higher short-term and long-term ROA and SR than the use of each of them alone (in ERP-only or NFPI-only firms)</li> </ul>