Predicted Shareholder Value as a Strategic Control and Monitor System in Small Companies

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Abstract

The purpose of the present paper is to introduce a simple shareholder valuation method that can be used as a strategic control system (SCS) and as a data base monitor tool and to control and benchmark the value of small and privately-owned companies. The study is structured into four parts. First, the plausibility of the approach as a valuation and management control method is discussed. In this approach, shareholder value is based on a finite horizon time series of profit (after taxes and interest) predicted for the firm. This prediction is divided into two parts: the profit level (profitability) and the rate of growth (growth). The predicted time series of profit is discounted to the present value using a risk-adjusted rate of discount (risk). Thus, there are three drivers which can be systematically used by the management to control shareholder value: profitability, growth, and risk. The method is also suitable for data base analysis to benchmark and monitor small, unlisted companies. Second, the paper also presents empirical evidence to evaluate the statistical features of the valuation measure. This evidence is extracted from 7781 small Finnish companies. Third, the data requirements set by the approach are investigated in a similar data base. Fourth, the applicability of the approach as a SCS is evaluated by a simple workshop survey.

Key words: valuation, small companies, data base analysis, control tool.

JEL classification: M Business Administration and Business Economics Marketing; Accounting, M4 Accounting, M41 Accounting.

1. Introduction

It has been argued that financial information is of limited value to investors (Amir & Lev, 1996; Lev & Zarowin, 1999; and Jones, 2003). This evidence is consistent with a systematic decline in the usefulness of financial information to investors as manifested by a weakening association between equity market values and key financial variables (earnings, cash flows, and book values). However, financial statements are the primary information that firms publish about themselves (Penman 2001, p. 2). This information is widely used by all the stakeholders of the firm, that is owners, investors, management, employees, customers, suppliers, and tax authorities. Financial statements are useful especially in data base analyses when drawing figures for industries and comparing target companies to industry averages and with peer groups for benchmarking purposes. In small companies, financial statements are utilized by the management often as a primary source for control information. These companies are typically simple organizations which do not have any notable management accounting systems (see Berry, 1998). In these companies, information based on book-keeping and financial statements may be the only financial information for the management to control the activities of the company.

Similarly, if the ownership and management are separated, this information may be the only covernance information provided to the owners of such firms. These simple firms do not have any definite need or resources to develop advanced information systems. In addition, the management in these firms does not have any motivation or ability to apply complicated systems. The best solution would be to develop a simple financial control tool based on financial statement information which is anyway obligatory for the firms to provide. However, this tool should connect financial statement information to the value of the company to provide the management with a strategic control system (SCS) and the owners with a covernance tool, to increase the value of the firm. When based on public information only, this kind of tool would be useful for other stakeholders and data base analyses, too. *The purpose of the study is to introduce such a valuation tool based on financial statements.*

The idea that the primary responsibility of the management is to increase company value has gained widespread acceptance during the last decades (see Bromwich, 1998; and Ameels, Bruggeman & Scheipers, 2002). Rappaport (1998, p. 3) states that this kind of (shareholder) value-based management has moved from being ignored to being rejected to becoming self-evident. Rappaport (1998, p. 1) predicts that, in ten years, (shareholder) value will more than likely become the global standard for measuring business performance. He introduced himself a measure of shareholder value (SV) based on three components: present value of cash flow from operations during the forecast period, residual value and marketable securities. Moreover, shareholder value added (SVA) can be deducted as a change in SV. SV and similar discounted cash-flow (DCF) measures of company value are multi-period metrics.

However, many of the valuation measures are single-period metrics which merely refer to value added. For example, Operating Cash Flow (CFO), Earnings Before Extraordinary Items (EBEI), Net Operating Profits After Taxes (NOPAT), Residual Income (RI), Economic Value Added (EVA©), Redefined Economic Value Added (REVA), and Cash Flow Return on Investment (CFROI) are such value added measures (see Bacidore, Boquist, Milbourn & Thakor, 1997; and Biddle, Bowen & Wallace, 1997). These measures would not be useful as management control tools without a management system based on the metrics. For example, shareholder value management (SVM) means a systematic management of the SV determinants which can be further divided into macro and micro value drivers (Rappaport 1998, p. 172). Several large consulting companies, like Stern Steward & Co, Marakon Associates, McKinsey & Co and Price Waterhouse Coopers, have presented their own value-based management (VBM) approaches (see Ameels, Bruggeman & Scheipers, 2002).

The valuation approaches above have each advantages and disadvantages. SV and other DCF multi-period metrics have a direct connection to the company value. However, their components (such as residual value) and the cash flow basis make them complicated. Moreover, cash flows are sensitive to operative manipulations that deal with accounts receivable, inventories, and payables and accruals. In addition, these measures are based on management predictions which are at least partly subjective. Market-value-based approaches are available only for listed companies. The single-period metrics have only an indirect (residual) connection to company value in that they refer to a change in the value. Single-period cash-flow metrics suffer from similar disadvantages as the multi-period DCF models. Accrual-based metrics are more simple but they may be sensitive to accounting manipulations such as inventory valuations and depreciations. Finally, as annual figures, the single-period metrics may lead to short-termism in decision making. As a summary, there is a wide variety of VBM metrics available for business companies. *However, none of the metrics may not be ideal for small, unlisted companies with limited management resources.*

The purpose of this paper is to introduce a new SCS that tries to connect the advantages of multi- and single-period metrics in the same framework. At the same time, the present SCS tries to avoid some of their disadvantages. This framework will resemble SVM in that it is based on shareholder value calculated on the basis of a discounted flow. However, instead of a cash flow, the approach is based on the time series of net profit, that is profit after taxes and interest (PATI). This approach is also simplified in that it is based on a fixed time horizon and does not include any residual value. Moreover, such items as marketable securities are ignored. These simplifications make the approach simple and useful in practice for small companies. The essence of the approach is to create a simple and mechanistic (objective) prediction of the SV. Thus it can be called as the Predicted Shareholder Value Analysis (PSVA). The value added in this framework can be calculated as the change of PSV in successive periods. Hence the management can explicitly identify the value and the associated value added in each period. In practice the annual PATI may be sensitive to accounting manipulation. Thus, in this framework, it should be calculated according to tight accounting rules fixed for successive periods, to avoid manipulation.

The PATI that is used in the estimation of the SV of the company, will be based on a weighted estimate of figures from several past years. This simple procedure helps the management to avoid short-termism. In addition to PATI (profitability), the estimation of the company SV will utilize an estimate of growth and risk. Thus, the SV is only based on three familiar determinants (value drivers), i.e. profitability, growth and risk which can be used to manage the value of the company.

The estimate of growth is derived from the time series of net sales. The risk estimate is drawn by an independent risk evaluation company. The estimates for profitability, growth, and risk are used to calculate the initial level of PATI, future flow of PATI, and the discounted value of this flow (SV), respectively. What is important to note, is that the approach enables us to calculate the SV on the basis of public financial information only. Moreover, it utilizes a mechanistic procedure and is independent of subjective evaluations, for example management predictions. Thus, it is useful in analysing large data bases for benchmarking and monitoring purposes by every stakeholder group.

The paper is organized around six requirements set for such a new management SCS described above. First, the tool should be theoretically justified. Section 2 presents the procedure used to calculate the new metrics. This procedure will be justified stage by stage and an illustrative case study (Nokia Corporation) is presented. Second, the SCS should be useful in managerial work and as a tool of other stakeholders. These aspects are briefly discussed in section 3. Third, the metrics should measure a dimension which cannot be entirely covered by traditional financial ratios. To analyse this requirement, the first sub-section of section 4 presents empirical evidence on the relationship between the PSV and financial ratios for 7781 small and middle-sized Finnish companies. Fourth, the data base requirements for the calculation of the metrics should not be too restrictive. These requirements are analysed in sub-section 2 with the aid of the data base of Finnish companies. Fifth, the tool should be understandable and easy-to-use from the perspective of management. These perspectives are analysed in sub-section 3 by a simple workshop evaluation prepared for a group of managers. Sixth, to provide something new, the tool should be different from the previous approaches. The fourth sub-section deals with a systematic comparison between the PSV and the previous metrics. Finally, the last section presents a short summary of the study.

2. Derivation of the predicted shareholder value

2.1. Basic choices

There are a number of different advanced valuation models (see Penman, 1998 and 2001; and Damodaran 2004). Most of these models are variations of the Gordon growth model (see Penman 2001, pp. 109-110). These models are typically based on predictions for a financial flow (earnings) and a discounted value of this flow. The present valuation method is also an earnings discount model. Hence the (shareholder) value is based on the discounted value of earnings to shareholders. Thus the approach should give a prediction of earnings and discount them to their present value. When comparing earnings discount models, Penman (1998, p. 303) says that:

> *"There are a variety of equity valuation techniques used in practice and discriminating among them is difficult. Many involve forecasting the future but they differ as to what is to be forecasted. Some forecast dividends, some forecast cash flows, some forecast earnings or residual income, and some forecast operating profit."*

Thus, there are differences between the models in what is the flow to be predicted, how it is predicted, what is the rate of discount, and how the residual value is calculated. The choice of these properties in the present PSV is based on the requirements discussed above. In general, the requirements set for simplicity and use of public information only, set restrictions for this choice.

The valuation is carried out in several steps illustrated by a numerical example in Appendix 1. In summary, the present PSV is based on an earnings flow of profit after taxes and interest (PATI) which will be mechanistically predicted for a ten year period. This predicted flow will be discounted with a risk-adjusted rate of discount to its present value where the risk is evaluated by an independent risk-evaluation company. These features can be justified as follows. First, the use of PATI is justified only when the degrees of freedom in income manipulation are small and, consequently, the reliability of income-based measures is high. The New Finnish Accounting Legislation (1997) allows only a narrow room for manipulation of profit (see http://www.finlex.fi/lains/index.html). For example, all the long-term expenditures should be depreciated according to the fixed management plan (§ 5). Moreover, the legislation implies a special cautiousness when the capitalization of R&D expenditures (§ 8) is considered. Followingly, profit figures are not sensitive to creative accounting in annual clos-

ing of accounts and annual figures can be used to apply the earnings discount model. The prediction of PATI will be carried out in a mechanistic way because it should be based on financial statement information only. Moreover, it should handle all companies in a similar manner in order to be useful in data base analysis and benchmarking.

Second, the method to estimate the risk premium should be applicable for private, small firms. Thus, an ordinary method to calculate the company-level beta will not be applied in the present approach. Instead, the risk will be measured by a risk measure publicly provided by an independent risk evaluation company, Finska Ltd (see http://www.asiakastieto.fi). This measure of financial risk is calculated on the basis of both detailed financial data and nonfinancial background information from the company, owners, and board (for such information see Laitinen, 1999). This risk measure can get values between 0 and 100 where 0 refers to an entirely risk-free company and 100 to a company with the maximum risk. Third, in practice forecasts are usually made for a finite number of years and this truncation of the horizon typically requires a terminal value or continuing value calculation at the horizon (Penman, 1998, p. 303). Because of the obvious inaccuracies associated with this terminal value, the present approach only calculates a value based on a ten-year horizon without a terminal value. In several experiments with publicly traded firms the ten-year horizon gave a valuation close to the market value. Moreover, these experiments showed that the ten-year-earnings value behaves according to the same logic as market values.

The assumptions described above provide us with a simple version of the Gordon growth model. To sum it up, the determination of the PSV in this approach will be based on estimation of four parameters. First, an estimate for the initial value of net sales is needed. Second, an estimate of PATI to net sales ratio is extracted. The product of these estimates gives an estimate for the initial level of PATI. Third, a growth rate for PATI is estimated. Finally, an estimate of the risk premium is obtained to calculate the rate of discount. In mathematical terms, equation (1) shows the metrics for the present PSV.

$$PSV = \left[NS(I) \cdot r\right] \cdot \frac{\left[1+g\right]}{\left[i-g\right]} \cdot \left\{1 - \left[(1+g)/(1+i)\right]^N\right\}, \quad (1)$$

where $NS(I)$ is the initial level of net sales, r is the estimated level of PATI to net sales ratio, g is the estimate for the growth rate, r is the risk-adjusted rate of discount, and N is the time horizon for prediction (specified here N=10). The mathematical formula of the *PSV* clearly shows the drivers of value, that is r, g, and i, and the systematic way they affect the *PSV*.

2.2. Estimation procedure and example

The details of estimation procedure can be highlighted by an illustrative example of Nokia Corporation which is a large Finnish publicly traded telecommunications company (see http://www.nokia.com). This publicly traded company has been chosen for analysis because it makes it possible to compare the PSV and the market value. This numerical example is presented in Appendix 1. Panel 1 in Table 1 shows the exemplary parameter values specified in the valuation model. These parameter values can be changed without any effect on the technical use of the metrics. However, it is important that these parameter values are known by the users (transparency), approved by them (commitment) and that these values are identical for all the firms benchmarked (comparability). The version illustrated here assumes that financial figures from past four years are available. Thus, the estimate of the rate of growth is first deducted from four-year time-series of net sales (see Appendix 1). Second, the estimate of the initial PATI is based on weighted average of four-year PATI to net sales ratios. Here a geometric weighting with a parameter 0.5 is applied so that the weight for the next period PATI ratio is always double the weight for the preceding PATI ratio. For this parameter, the weight of the last year is more than 50%. The weighting procedure is of importance because it helps the management avoid short-termism in decision making (see next section).

Third, using the same weights as above, the initial level of net sales is calculated as a weighted sum of current and previous net sales figures after extracting the growth trend away. Fourth, the initial PATI level is obtained as a product of the initial PATI to net sales ratio and the initial net sales. Fifth, with aid of the initial PATI level and the estimated growth rate, a series of

future PATI is generated as a prediction. For simplicity, a finite horizon of ten years is applied in prediction and no residual value is assumed. Finally, the series of PATI is discounted by a risk-adjusted rate of discount to give an estimate for the SV. In order to determine the risk-adjusted rate of discount, three parameters are given. This rate of discount consists of risk-free rate of interest and a risk premium. The risk premium has a constant plus a term proportional to a risk measure provided by Suomen Asiakastieto Oy (Finska Ltd).

Table 1

Example of shareholder value determination through the PSVA (Nokia)

1. Parameters of the model

	Time period				
	t-3	**t-2**	**t-1**	**t**	**Sum**
Weights of periods	0.0667	0.1333	0.2667	0.5333	1.0000
Number of years in estimation	4				
Horizon (years)	10				
Residual value	0.00				
Risk-free rate of interest	4.00				
Risk premium:					
Constant	2.00				
Maximum premium	25.00				

2. Firm-specific input data for Nokia (Source: Nokia's Annual Report 2002 and Finska)

Year	Net sales (EURm)	PATI (EURm)	Risk measure (Finska)
1998	13326	1750	
1999	19772	2577	
2000	30376	3938	
2001	31191	2200	3.0
2002	30016	3381	3.0

3. Shareholder value drivers for Nokia

	2001	**2002**
Average annual rate of growth (growth)	36.39	10.48
Weighted PATI to net sales ratio (profitability)	9.83	10.49
Risk-adjusted rate of discount (risk)	6.75	6.75

4. Shareholder value of Nokia calculated by the metrics

Shareholder value for 31.12.2001 (EURm)	166930
Shareholder value for 31.12.2002 (EURm)	40619
Value added in 2002 (EURm)	-126311

5. Market shareholder value of Nokia

Shareholder value for 31.12.2001 (EURm)	137163	24.01.02	127927
Shareholder value for 31.12.2002 (EURm)	72537	23.01.03	65068
Value added in 2002 (EURm)	-64626		-62859

Panel 2 presents the information from Nokia needed to estimate its SV according to the specified metrics. This panel includes five-year time-series for net sales and PATI to make it possible to calculate the SV for two successive years, 2001 and 2002. The risk measure is only needed for these two years. The value of the risk measure is identical for both years. Panel 3 presents the three determinants of SV calculated for Nokia. First, the predicted rate of growth has radically declined in 2002. Second, the level of profitability has a little improved and shows a moderate degree of stability. Third, the risk has stayed unchanged in this year. These determinants tell us that the SV may have prominently decreased due to the decline in growth. Panel 4 shows the estimates of the SV for the years 2001 and 2002 as well as their difference, value added. The SV of Nokia has decreased as much as 76% in 2002 due to a radical decline in predicted growth.

Panel 5 of Table 1 presents the corresponding market SVs of Nokia for 2001 and 2002. These values are presented for the end of the years and for the dates when the annual financial statements are published. The market SV does not decline as remarkably as the SV based on the present metrics. The weaker reaction may be associated to that financial markets react to investor expectations, not the published figures alone. Although there is a significant decline in the growth trend of Nokia, investors may expect for faster growth in the future. To give information of the future, Nokia's press release on 23th January 2003 Nokia tells for example that:

> *"Nokia expects market conditions to remain challenging, and will continue to build on its industry-leading position, seeking to achieve high profitability as well as to grow market share in its two main businesses."*

The metrics of the present approach shows that Nokia's calculated SV would be exactly identical to the market SV, provided that the predicted growth of rate were 20.14% instead of 10.48% calculated, ceteris paribus. It may be so that the investor long-term growth expectations at the end of 2002 were closer to 20% than 10%. For example, in the longer version of press release on 19th October 2001 Nokia gave an estimate of 25-35% for the annual long-term growth.

3. Predicted shareholder value as a strategic control tool

3.1. Management control tool

The simple metrics of the present approach clearly shows the determinants of the PSV, i.e. growth, profitability, and risk. The first determinant is the rate of *growth* that is (in this specification) calculated from four-year stabilized time-series of net sales. Because the approach is based on the predicted SV, shorter time-series are not applicable. Longer time-series would make it possible to use more advanced prediction methods. However, in small companies changes are usually fast and financial information older that four years may have totally lost its prediction power. Four years are enough to extract a growth trend from the time-series data. Because of variations in sales volume typical to small firms, a simple stabilization procedure is necessary. The growth rate calculated in this way, may be a powerful management tool to affect the SV. The management can increase the SV of a company by increasing the trend estimate for the growth rate in net sales. This trend estimate is not very sensitive to current growth but is also dependent on past growth rates. *The predicted SV will slowly change with the trend of growth which avoids short-termism.* The net sales growth rate is not sensitive to operational or accounting manipulation, provided that we have clear rules for the riskiness and payment period for accounts receivable included in net sales.

The second value driver which can be used as a management tool to affect the SV, is *profitability* that is here associated with the weighted PATI to net sales ratio. For the sake of the geometric weights applied here, the effect of a recent increase in PATI is slowly absorbed with the estimated ratio that affects the SV. *This will diminish the effects of random fluctuations in profitability prediction and, in practical management, short-termism in decision making.* In order to implement the PSV management properly, the weights should be made consistent with the decision making policy of the firm. In the present version, PATI in the current year had a weight more than 50%. It is evident that the application of the PATI ratio is reasonable only when we have clear accounting rules for valuations and depreciations. In Finland, for example, a company must have a pre-fixed plan for depreciations that must be followed during the life of fixed asset as mentioned

above. Therefore, the room for creative accounting may be narrow and published annual PATI figures give a reliable estimate of periodic profitability. In practice, PATI is also a very familiar concept to the management in small businesses and has a direct connection to profit. Thus it has clear advantages when compared with a more complicated cash flow concept.

The third determinant of the SV is the *risk* associated with the company. The management can increase the SV by decreasing the riskiness of the firm. In the present approach the risk is connected with the risk-adjusted rate of discount which directly affects the PSV. The calculation of the risk-adjusted rate of dicount is based here on a company-level risk estimate provided by an independent risk evaluation company (Finska Ltd). This estimate can get values between 0 (risk-free firm) and 100 (extremely risky firm). This risk measure is based on a large data base on the past financial history, payment behavior, company group, industry, and characteristics of the MD and the board of the firm. This actually means that the ways in which the management can diminish the risk estimate is to improve and stabilize profitability, liquidity, capital structure, payment behaviour, and the quality of MD and board. *There is no room for manipulation.* Because the risk estimate is based on the past history of the company, the effects of these improvements are slowly absorbed with the risk in the same way as for growth and profitability.

Table 2 shows numerical figures for Nokia's PSV considered in the previous section, to illustrate the effects of the three value drivers. The effect of profitability is straightforward: when the weighted PATI to net sales ratio is doubled, also the PSV is doubled. This is because the predicted series of PATI is directly proportional to this weighted ratio estimate. This effect is illustrated by Panels 1 and 2 where the latter panel is based on a doubled PATI ratio estimate. The effects of growth and risk are closely associated with each other. When the risk is large, the effect of growth on the PSV is diminished. Thus a rapid growth is not an effective tool to increase the PSV, when it leads to an increased risk. In priciple, the effects of risk and growth are symmetrically related, since growth describes a constant-rate growth for PATI while risk refers to a constant-rate discounting.

Table 2

Predicted SV of Nokia for different values of determinants

1. PATI to net sales ratio = 10.49%

	Risk-adjusted rate of discount				
Growth rate-%	5.40	6.08	6.75	7.43	8.10
8.38	39145	37745	36416	35153	33953
9.43	41379	39879	38456	37104	35819
10.48	43750	42144	40619	39172	37797
11.53	46267	44546	42914	41364	39893
12.57	48938	47095	45347	43689	42114

2. PATI to net sales ratio = 20.97%

	Risk-adjusted rate of discount				
Growth rate-%	5.40	6.08	6.75	7.43	8.10
8.38	78290	75491	72832	70307	67906
9.43	82758	79759	76912	74208	71638
10.48	87501	84288	81239	78344	75593
11.53	92534	89092	85827	82728	79786
12.57	97875	94189	90694	87377	84228

Figure 1 describes the factors which affect the three determinants of the PSV. The management of a company can increase growth rate when investing successfully in products and markets. Superior products, marketing efforts, and new markets are obvious sources for growth. Price decisions and cost control are important factors of profitability. Evidently, high prices and low costs through cost efficiency will lead to a high profitability, provided that it is consistent with customer preferences. Risk is dependent on business activities (business risk) and finance (financial risk). Stabilized business activities and management give a low business risk. Small amounts of current and long-term debts are characteristics of a low financial risk. Hence, the system of controlling the PSV is, in principle, simple and clear.

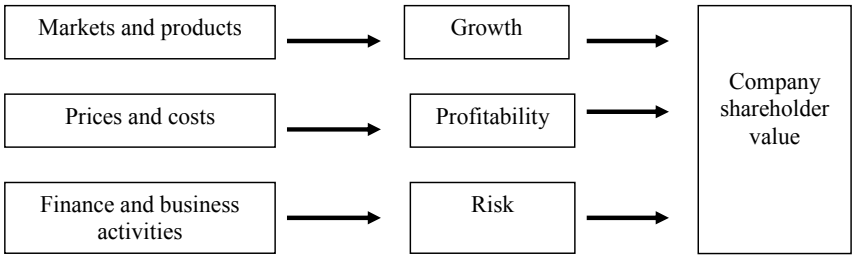

Fig. 1. Determinants of company shareholder value

In practice, the management is confronted by the interrelationships between the determinants (drivers) of the PSV. There are important tensions between growth, risk, and profitability and the management must be able to balance them to control the company successfully. For example, marketing mix is composed of components which affect both growth and profitability, such as price, quality and marketing cost. Fast growth is often based on investments financed by debt. Moreover, it often makes business activities instable. These tensions between the SV determinants are illustrated by Figure 2.

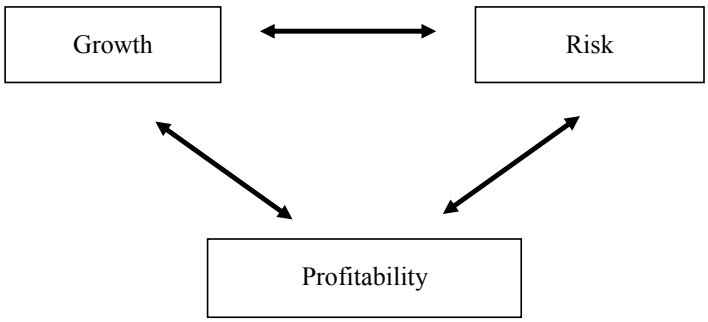

Fig. 2. Tensions between the company value drivers

3.2. Stakeholder monitor tool

The PSV analysis may serve as a straightforward tool to steer the company according to the principles of SV maximization. When applied as a governance method, it also provides the owners of the company with a monitor tool to evaluate how well the management takes account of the SV in their decision making. From the perspective of governance, it is important that both the owners and managers approve of the PSV as the target for maximization, are aware of the calculation rules, and, finally, are committed to manage the firm through the three value drivers, growth, profitability, and risk. It is equally important that the reward system of firm will be associated with the target to maximize the PSV, that is value creation. If the reward system is linked to the determinants of the PSV, it is essential to pay attention to the tensions between these determinants.

The metrics of the PSV analysis can be applied as a monitor system also by other stakeholders of the company, than the management and owners. Because the analysis can be based on public information only, it is available for any interested outside stakeholder group, such as financers, competitors and potential investors. In the present version of the model, growth and profitability estimates can be extracted from public financial statements which are available from several data bases provided for example by Finska Ltd and the National Board of Patents and Registration of Finland (http://www.asiakastieto.fi and http://www.prh.fi). The risk measure used here can be obtained from Finska Ltd for any company in Finland. Thus, the method is a simple and fast screening method for stakeholders to evaluate, benchmark, and monitor value creation also in small and private companies.

One of the main advantages of the PSV analysis is that it is independent of subjective forecasts. All the predictions are made according to given mechanistic rules on the basis of realized figures. This actually means that the method is suitable for calculating and monitoring the SV in large data bases of companies. It gives a simple method to calculate statistical benchmarks for alternative company populations, such as alternative industries, size classes, and peer groups. When applied for these kinds of monitoring purposes, the method will direct the management of monitored companies to make decisions in accordance to increase SV through growth, profitability, and risk. Moreover, it gives a motivation to pay attention to the tensions between these three determinants. *Hence, when applied in the right way, the method may function as a similar mechanism as market value in publicly traded companies.* However, the valuation in the PSV analysis is not based on subjective expectations as in the public stock markets. This may lead to differences in value reactions to changes in financial information, as for Nokia in the illustrative example above.

4. Evaluation of the PSV metrics

4.1. Relationship to financial ratios and book value

The PSV metrics should not be too closely associated with familiar financial ratios in order to provide something new. Especially, it should differ from a traditional shareholder book value which is largely based on the past profitability. The statistical characteristics of the PSV can be illustrated by descriptive statistics presented in Table 3 below. These figures are calculated for a data base of 7781 small and middle-sized Finnish companies for the year 2000. Thus, the growth and profitability determinants of the SV are estimated from the time series for 1997-2000 and the risk measure is evaluated by Finska in autumn 2000. The average size of companies is small, since the average values of net sales and total assets are only 1,240 and 0,898 EURm, respectively. The average risk measure is 26.1 which, applying the current procedure (see Appendix 1), leads to the rate of discount 12.6%. The average prediction for the PATI to net sales ratio is only 1.8% while the mean of predicted growth rates is 5.5%.

The average ten-year PSV in the sample is 0,4699 EURm while the average book value is only slightly less, that is 0,3837 EURm. However, the mean multiple of the estimated PSV to the book SV is 2.3 which shows that the distributions of the values are different. This difference is also supported by the coefficient of correlation between these values that is only 25.1%. Thus the predicted SV in this data base statistically measures a different dimension of value than the book SV. The PSV is correlated with all the three determinants (value drivers) but none of them does not dominate the value. *Thus it may act as a balanced score of growth, profitability, and risk.* It is important that PSV is not correlated at all with annual profitability ratios (based on PATI), liquidity ratio (current debt to total capital) and indebtedness (total debt to total capital). Hence it obviously brings a new dimension for financial analysis which is related to the value drivers.

Table 3

Descriptive statistics for the financial and value variables

Variable	Mean	Standard deviation	Correlation to the PSV
Net sales (EUR thousand)	1240	3660	0.2795
Total assets (EUR thousand)	898	2189	0.2126
PATI to net sales	0.041	1.367	0.0587
PATI to total assets	0.065	0.350	0.1675
Current debt to total capital	0.398	0.617	-0.0446
Total debt to total capital	0.605	1.009	-0.0625
Risk measure (autumn 2000)	26.118	19.668	-0.2742
Predicted PATI to net sales	0.018	0.521	0.1363
Predicted growth	0.055	0.209	0.2300
Risk-adjusted rate of discount	0.126	0.049	-0.2740
Predicted shareholder value	469.9	1455.0	1.0000
Shareholder book value	383.7	1172.0	0.2510
Predicted SV to book value	2.311	10.146	0.3095
Predicted SV to net sales	0.435	6.700	0.2083
Predicted SV to total assets	1.088	3.561	0.4100
Book SV to net sales	1.348	12.096	0.2795
Book SV to total assets	0.394	1.093	0.2126

Table 4

Factor solution for financial and value variables

	Rotated Factor Pattern		
	Factor1	**Factor2**	**Factor3**
Net sales (thousand euro)	0.0657	0.0203	**0.7389**
Total assets (thousand euro)	-0.0093	-0.0641	**0.9159**
PATI to net sales	-0.0730	**0.3860**	0.0127
PATI to total assets	-0.1322	**0.6084**	-0.0377
Current debt to total capital	**0.8093**	-0.0205	0.0069
Total debt to total capital	**0.9237**	0.0310	0.0263
Risk measure (autumn 2000)	**0.5697**	-0.4428	-0.1890
Predicted PATI to net sales	-0.0803	**0.5530**	-0.0635
Predicted growth	0.0709	**0.4193**	-0.0229
Risk-adjusted rate of discount	**0.5698**	**-0.4426**	-0.1889
Predicted shareholder value	-0.0372	**0.5356**	0.4017
Shareholder book value	-0.1172	-0.0278	**0.8566**
Predicted SV to book value	0.0684	**0.5661**	-0.0281
Predicted SV to net sales	0.0150	**0.5680**	-0.0303
Predicted SV to total assets	-0.0617	**0.7829**	-0.0421
Book SV to net sales	-0.1322	-0.0592	**0.1410**
Book SV to total assets	**-0.9000**	-0.0384	-0.0298
Variance Explained by Each Factor:	**3.0473**	**2.9473**	**2.3825**

The dimensions associated with the PSV were also analysed by the factor analysis. Table 4 presents a varimax-rotated three-factor solution for the variables. This three-factor solution ex-

plains for 49.3% of the total variance of the variables. The first and second factors have almost equal eigenvalues. The first factor obviously refers to *"the risk of the company"*. The book SV in relation to total assets is however also loaded on this factor with a negative sign. This is expected since this ratio is an inverted measure of indebtedness and a version of total debt to total capital ratio. The second factor is associated with the predicted SV and its two drivers. Thus the factor can be called as *"the predicted shareholder value of the firm"*. This factor shows that the PSV is associated with the growth and profitability determinants (value drivers). The risk determinant (value driver) is loaded on the first factor, along with the current debt to total assets and total debt to total assets ratios. However, it has a rather high loading on the second factor, too. The third factor is dominated by the size measures (net sales and total assets) and thus can be called as *"the size of the company"*. However, the book SV is also loaded on this factor. *Thus, the familiar book SV mainly refers to the size of firm, whereas the PSV is a dynamic concept and in a balanced way linked to profitability, growth, and risk.* Therefore, these SVs refer to quite different dimensions.

4.2. Data base analysis

When applying the PSV analysis in large data bases of small firms such as above, problems may emerge because of inconsistencies or large variations in annual financial figures. These kinds of inconsistencies and variations may lead to predictions which are not consistent with reasonal expectations on the future of a small firm. It is important to identify and avoid these kinds of problems, when using a shareholder analysis for benchmarking and monitoring purposes. These problems in small business data bases may be so frequent, that the method used in prediction must be very simple and safe. For example, a large number of small companies have financial information only for two or three years which makes it impossible to get reasonable predictions at all. However, even for four-year or longer time-series severe difficulties may arise due to the data problems. Table 5 presents the problems identified in the data base of 7781 Finnish small firms analysed above. The firms in this data base have a time-series of at least four years. The initial data base included 25531 firms. Thus the percent of firms available for the PSV analysis on a four-year basis is 30.5%. For longer time-series than four year, the percent would be dramatically lower.

Table 5

Observed inconsistencies and large variations in the data base (N = 7781)

	Number of firms	%
1. Estimation of the growth rate in net sales		
Net sales is zero at least in one of the four years	404	5.19
Annual rate of growth at least in one year is < -50%	1020	13.11
Annual rate of growth at least in one year is > 100%	1415	18.19
The maximum difference between annual rates of growth > 200%	986	12.67
2. Estimation of the PATI to net sales ratio		
Annual PATI to net sales ratio at least in one year is < -50%	498	6.40
Annual PATI to net sales ratio at least in one year is > 50%	400	5.14
The maximum difference between annual PATI to sales ratio is > 100%	450	5.78
3. Overall evaluation		
At least one of the conditions above is valid	2051	26.36

The main problems in predicting the SV may be identified in growth rate and PATI to net sales ratio estimation. More than 5% of the firms have a zero net sales at least in one year. Additionally, there were large variations in annual rates of growth. About 13% of the firms suffered at least in one year from a remarkable negative growth (less than -50%), whereas more than 18% reported an annual growth of 100% or more. Large variations were also observed in the PATI to sales ratios. More than

6% of the firms have a ratio equal to or less than -50% at least in one year whereas about 5% showed a figure of 50% or more. In all, at least one of the conditions analysed, was fulfilled by 26% of the companies. *This result obviously shows that when applying a prediction method to small business data, stabilization of time-series and use of safe and simple methods are of crucial importance.* When the present PSV analyses were developed, special attention was paid to these requirements.

4.3. Workshop evaluation

A SCS is not useful in practice if it is not also well justified, easy-to-use and understandable in the eyes of managers. Thus far only preliminary evidence is got about these requirements. In general, the proposed PSV analysis has been presented in several seminars in Finland and the informal comments obtained from the audience are generally good. Formally, the PSV analysis was evaluated by a survey in a small management workshop taken part by nine business managers. Table 6 shows the results of this survey. The evaluations are based on one hour presentation by the author with an example of the calculation procedure (metrics) and discussions around the method. The nine participants of the workshop are very different with respect to the size of their firm, position, experience, level of basic education, and vocational education. Thus, the results are classified with respect to these characteristics. Because of the small size of sample, the results are preliminary and no statistical tests are used. The SPV analysis was evaluated on a five-point scale on the basis its intelligibility, assumptions, and usability.

The overall average of the given ratings is 3.5 which refers to the middle point between "good" and "very good". On an average, the intelligibility, assumptions, and usability of the analysis are regarded as more than "good" by every characteristic listed in the survey. The managers from small companies with less than 50 employees give a little lower overall rating than the average. Especially, they give a low rating to the intelligibility of the logic in the calculation procedure. With respect to the position of the manager the ratings are quite similar. However, top managers give a rating less than "good" for the intelligibility of the logic in the calculation procedure and of the discounted earnings calculation. Experience seem to affect only a couple of ratings. Less experienced managers give a high rating for the way to use a risk measured by an independent company, while more experienced ones do not like the elimination of the residual term.

The strongest effect on the ratings is got by basic education. The managers with lower level basic education give low ratings (2) for several characteristics of the analysis. On the contrary, the managers with business vocational education give especially high ratings. Thus it seems, that without any longer training course on the tool, the PSV analysis is regarded by managers as a promising method. Especially, well educated managers with business vocational education in small companies with 50-250 employees seem to appreciate the method. It may be so that, at least after only a brief presentation, less educated managers in very small firms have difficulties to follow the logic of the approach. Thus, when applying the PSV analysis in practice, a lot of attention should be paid to training to commit the management to the tool.

4.4. Comparison to other VBM metrics

There are a number of VBM approaches used by larger companies and sponsored by consulting companies (see Ameels, Bruggeman & Scheipers, 2002). Thus it is important to compare the present PSV analysis with the previous approaches. The PSV approach introduced in this paper is only in its initial stages as a full-scale VBM with detailed discussion of strategy development, strategy deployment, investment decisions & resource allocation, reward system, and training & education. Thus, it is reasonable only to compare the metrics applied in alternatives approaches. Table 7 presents a summary of metrics used by five consultants and the proposed metrics. Many of the consultants use single-period metrics, like MVA, EVA, ES, and EP. Those consultants who use multi-period metrics, like CFROI and DCF, do generally apply also single-period measures to support performance measurement. The problem with applied multi-period metrics is that they are based on subjective predictions of the future. Also, when connecting single-period metrics consistently to long-term value creation, they should be calculated on the basis of long-term predictions. This is because the annual metrics should be a measure of the value added in the long-term shareholder value creation.

Table 6

Workshop evaluation of the PSV analysis

		Number of employees			Position		Experience in years		Level of basic education			Vocational education area		
	Average rating	-50	50-250	250-	Middle	Top	0-10	10-	Lower	Middle	University	Accounting	Business	Other
1. Number of respondents (N = 9)		3	3	3	5	4	4	5	2	5	2	2	2	5
2. Evaluation of the intelligibility of the PSV analysis														
Intelligibility of the overall idea of the method	**3.7**	3.3	4.0	3.7	3.8	3.5	3.5	3.8	3.0	3.8	4.0	3.5	4.0	3.6
Intelligibility of the logic in the calculation procedure	**3.2**	2.7	3.7	3.3	3.6	2.8	3.0	3.4	2.5	3.4	3.5	3.0	3.5	3.2
Intelligibility of the growth rate estimation	**3.6**	3.0	3.7	4.0	3.8	3.3	3.8	3.4	3.5	3.6	3.5	3.5	3.5	3.6
Intelligibility of the profitability estimation	**3.3**	3.0	3.7	3.3	3.6	3.0	3.3	3.4	2.5	3.6	3.5	3.5	3.5	3.2
Intelligibility of the risk analysis	**3.4**	3.3	3.7	3.3	3.4	3.5	3.5	3.4	3.5	3.4	3.5	3.0	4.0	3.4
Intelligibility of the discounted earnings calculation	**3.2**	3.0	3.3	3.3	3.6	2.8	3.0	3.4	2.5	3.4	3.5	2.5	4.0	3.2
3. Assumptions of the PSV analysis														
Use of PATI (instead of cash flows) as earnings concept	**3.7**	3.7	4.0	3.3	3.6	3.8	3.5	3.8	2.5	4.0	4.0	4.0	4.0	3.4
Use of a ten-year horizon for prediction	**3.6**	3.3	4.0	3.3	3.2	4.0	4.0	3.2	3.0	3.8	3.5	3.5	4.0	3.4
Elimination of the residual value	**3.2**	3.3	3.0	3.3	3.0	3.5	3.8	2.8	3.0	3.4	3.0	3.0	3.5	3.2
Use of a risk measure estimated by an independent company	**3.7**	3.7	3.3	4.0	3.6	3.8	4.3	3.2	3.0	3.8	4.0	3.5	4.0	3.6
Use of mechanic predictions based on financial information	**3.4**	3.7	3.3	3.3	3.4	3.5	3.5	3.4	3.0	3.6	3.5	3.5	3.5	3.4
Lagged effect of financial information on predictions	**3.7**	3.3	4.3	3.3	3.6	3.8	3.8	3.6	3.0	4.0	3.5	4.5	3.5	3.4
4. Usability of the PSV analysis														
Overall usability as a management tool	**3.3**	3.0	3.7	3.3	3.4	3.3	3.0	3.6	2.5	3.4	4.0	3.5	3.0	3.4
Overall usability as a monitor tool for stakeholders	**3.3**	3.3	3.3	3.3	3.4	3.3	3.3	3.4	2.0	3.6	4.0	3.5	3.5	3.2
Average rating	**3.5**	**3.3**	**3.6**	**3.5**	**3.5**	**3.4**	**3.5**	**3.4**	**2.8**	**3.6**	**3.6**	**3.4**	**3.7**	**3.4**

Scale of evaluation: 1 = poor, 2 = satisfactory, 3 = good, 4 = very good, 5 = perfect

Table 7

Comparison of different approaches on value-based metrics (corporate level)

Exemplary sponsor	Name	Simplified definition	Basis	Period	Subject-ivity
Stern Steward & Co	MVA	Market Value Added = Market value – Adjusted book value of debt and equity	Market, accrual	Single	No
	EVA	Economic Value Added = Operating profit after tax (NOPAT) – Cost of capital	Accrual	Single	No
Marakon Associates	ES	Equity Spread = Return on equity – Cost of equity	Accrual	Single	No
	EP	Economic profit = Operating profit after tax (NOPAT) – Charge for average operating capital employed	Accrual	Single	No
McKinsey & Co	DCF	Discounted Cash Flow = Present value of cash flow from operations minus cash investment (Free Cash Flow)	Cash-flow	Multi	Yes
	EP	Market Value Added = Market value – Adjusted book value of debt and equity	Accrual	Single	No
Price Waterhouse Coopers	CFROI	Cash Flow Return On Investments = Cash flow-based internal rate of return on invested capital	Cash-flow	Multi	Yes
	SVA	Shareholder Value Added = Present value of incremental cash flow – Present value of investment in fixed and working capital	Cash-flow	Multi	Yes
	FCF	Free Cash Flow = Cash flow from operations – Cash investment	Cash-flow	Single	No
L.E.K. Consulting	SVA	Shareholder Value Added = Present value of incremental cash flow – Present value of investment in fixed and working capital	Cash-flow	Multi	Yes
The proposed metrics for small firms	PSV	Predicted Shareholder Value = Mechanically predicted present value of profit after taxes and interest (PATI)	Accrual	Multi	No
	PSVA	Predicted Shareholder Value Added = Change in PSV	Accrual	Multi	No

Table 7 shows that the PSV differs from previous approaches in many respects. All the single-period metrics, except for the FCF, are accrual-based, whereas all the multi-period metrics are cash-flows. In addition, all the previous multi-period metrics are based on predicted cash flows and, in practice, exposed to subjective evaluations. The proposed PSV analysis is totally accrual-based that is a familiar concept also for small business managers with a low-level education. It uses the same model to calculate the SV and the SVA. *Thus it gives a logical interpretation for a value and a change in that value.* Moreover, the PSV analysis in the present form is entirely based on publicly available information. Subjective espectations do not affect the value at all: all the changes in value are based on realized, published figures. If the management wants to increase the SV, it must really do something to affect financial performance. This is important because the planning systems in small companies are not usually sophisticated and the management expectations (or plans) for the future may be unrealistic. In the PSVA, the monitoring and governance systems are transparent, because the calculation rules are known and information is available to all the stakeholders.

5. Summary

The idea of the present paper was to introduce a simple shareholder valuation method that can be used as a SCS to systematically increase and monitor the value of a small firm. The method

gives a mechanistic prediction of the SV based on growth (extracted from four-year time series of net sales), profitability (PATI to net sales ratio), and risk (estimated by an independent risk evaluation company). These three components form the explicit value drivers of the SV. For tight accounting rules (like recently applied in Finland) the method allows a derivation of the SV that is not dependent on subjective predictions but is entirely based on publicly available information. The growth and profitability estimates are based on smoothed time series which is important taking account of the instability of small firms. Thus, the estimates of growth and profitability are based on trend component of the time series. For the sake of this kind of lagged estimation the PSV analysis avoids short-termism. The SV is thus based on three drivers which can be used to increase company value: profitability, growth, and risk. However, in order to affect the SV, the management must really change the trends for net sales and PATI, not only the expectations.

Within this simple framework the small business management can control the activities of the company paying attention to the tensions between profitability, growth, and risk. The PSV analysis includes a natural connection between the SV and the annual change in the SV, that is in the value added. Thus it directly allows a consistency in decision making with respect to short-term and long-term SV analysis. The method is transparent because all the SV calculation rules are known and the information public to all of the stakeholders of the firm. Since the method is based on mechanistic accounting rules and an independent risk evaluation, it is suitable to benchmark and monitor nonlisted private companies by any stakeholder group. For this reason it is also useful in data base analyses of SV and SVA in large samples of small firms. When applying the PSV as a full-scale management system, a lot work must be done on training & education as well as in developing consistent reward and other support systems. These aspects are beyond the scope of this paper but they should be focused on later stages of method development. Finally, more research is called for on analysing the relationship between the PSV and the market values as well as on evaluating the effects of the model assumptions on the PSV.

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Appendix 1

Numerical example of the PSVA procedure (Nokia)

The procedure (metrics) to estimate the SV for a company is illustrated by a numerical example from Nokia. The financial figures are taken from Nokia's Annual Report 2002 (http://www.nokia.com). First, an estimate of the growth in net sales is drawn. Net sales figures for the four-year period of 1999-2002 are as follows: 19772, 30376, 31191, and 30016 EURm. The time-series is stabilized by averaging the first pair and the last pair of observations, that gives (19772+30376)/2 = 25074 and (31191+30016)/2 = 30604 EURm, respectively. Because the time lag between these averaged values is two years, an estimate for an average annual rate of growth is simply

$$(30604 / 25074)^{1/2}-1 = 0.1048 = 10.48\ \%.$$

This figure will be used as an estimate for the predicted rate of growth in SV determination (the first driver of value).

Second, the level of the PATI to net sales ratio will be estimated. A geometric weighting with a parameter 0.5 for the four past figures is used, so that the weight for the next period PATI ratio is always double the weight for the preceding PATI ratio. Since the sum of the weights is unity, the weights are 0.0667, 0.1333, 0.2667, and 0.5333 where the last weight refers to the weight of the last year's PATI ratio. The observed PATI to net sales ratios for Nokia in 1999-2002 are 0.1303, 0.1296, 0.0705, and 0.1126 per cent respectively. Thus the weighted level of the PATI ratio is

$$0.0667\cdot(0.1303)+0.1333\cdot(0.1296)+0.2667\cdot(0.0705)+0.5333\cdot(0.1126) = 0.1049 = 10.49\ \%.$$

This figure is a prediction of the profitability of the firm (the second driver of value).

Third, an estimate for the level of net sales will be calculated. In order to get a proper estimate the growth in net sales will be eliminated. This means that all the observations from the past years are transferred (rediscounted) to the last period by using the estimated growth rate. Thus, the net sales in 1999 will be transferred to 2002 as follows

$$19772\ (1+0.1048)^3 = 26661\ \text{EURm}.$$

Similarly, the transferred net sales figures from 2000, 2001, and 2002 are 37075, 34459, and 30016 (unchanged) EURm respectively. The estimate for the level of net sales is then got through weighting as follows

$$0.0667\cdot(26661)+0.1333\cdot(37075)+0.2667\cdot(34459)+0.5333\cdot(30016) = 31918\ \text{EURm}.$$

Fourth, the initial level of PATI will be calculated as a product of the estimated PATI to net sales ratio and the estimated level of net sales. For the figures above we get

$$0.1049 \cdot 31918 = 3347\ \text{EURm}.$$

The estimates for the initial level of PATI above and the predicted growth rate make it possible to predict a future flow for PATI. This prediction is based on an assumption that after the initial level PATI will grow at the predicted, constant rate.

Fifth, in order to calculate the SV of the company a risk-adjusted rate of discount is needed. This rate can be presented as a sum of a return on risk-free investment and a risk premium. The risk-free return can be approximated for example by the EURIBOR rate of interest or by a similar rate. In this example, this rate is assumed to be 4.00%.

The method to estimate the risk premium should be applicable for private, small firms. Thus, an ordinary method to calculate the company-level beta is not applied. Instead, the risk will be measured by a risk measure provided by an independent risk evaluation company Suomen Asiakastieto Oy (Finska Ltd, see http://www.asiakastieto.fi). This risk measure can get values between 0 and 100 so that 0 refers to an entirely risk-free company and 100 to a company with the maximum risk.

The risk premium used here consists of a constant and a proportionate part. The constant is equal for all companies. In this example this constant is 2.00 per cent unit. The proportionate

part is directly related to the value of the risk measure above and the maximum premium given. The maximum premium is assumed here to be 25.00 per cent unit. The risk measure for Nokia is 3.0 which gives a risk premium of

$$2.00 + (3.00 \cdot 25.00)/100 = 2.00 + 0.75 = 2.75 \text{ per cent unit.}$$

Thus, the risk-adjusted rate of discount in this example is 4.00+2.75 = 6.75 per cent.

Sixth, the SV of the company can be calculated when a time horizon is decided. In this example a SV based on a predicted ten-year flow of PATI will be calculated. Thus we have the following predicted series for PATI:

$$3347 \cdot (1+0.1048)^1, 3347 \cdot (1+0.1048)^2, \ldots, 3347 \cdot (1+0.1048)^{10} = 3698, 4085, \ldots, 9065 \text{ EURm.}$$

When discounting the flow of PATI to the present value by the risk-adjusted rate of discount (6.75%), we get an estimate of SV as 40619 EURm. Thus the present metrics give us a SV value of 40619 EURm for Nokia at the end of 2002.