



Information in balance sheets for future stock returns: Evidence from net operating assets[☆]

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ABSTRACT

In this paper, we show that the negative relation of net operating assets (NOA) with future stock returns first documented by Hirshleifer et al. (2004) applies to both net working and investing pieces of NOA, while it is mostly driven by asset NOA components. Predictability of returns is significant only for their unexpected parts (unrelated to past sales growth) and not uniform across different industries. We also find that only high (low) NOA firms with asset expansion (contraction) and weak (strong) background of profitable investments exhibit negative (positive) abnormal returns. Our evidence suggests that the NOA anomaly may be present due to a combination of opportunistic earnings management and agency related overinvestment.

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1. Introduction

In this paper, we investigate the informational content of firms' balance sheets for future stock returns, extending a particular line in the literature¹ and offering a number of novel results. Our focus is on the

level of net operating assets that represents the cumulation over time of the difference between operating income (accounting profitability) and free cash flow (cash profitability). In other words, the level of net operating assets is a cumulative measure of total accruals – a measure of balance sheet bloat. Hirshleifer, Hou, Teoh, and Zhang (2004) find that the level of net operating assets, scaled by lagged total assets (NOA, hereafter), is a strong negative predictor of future stock returns for at least three years after the balance sheet information is released. They name this finding the “sustainability effect”, by recognizing that an accumulation of accounting income without an accumulation of free cash flows raises doubts about the sustainability of current earnings performance. As a result, the level of net operating assets can be used as a measure of earnings quality and thus, may also have predictive power for future stock returns.

In fact, Hirshleifer et al. (2004) argue that high NOA is an indicator of a rising trend in current profitability that is unlikely to be sustained in the future causing investors, with limited attention, who focus in accounting income to make flawed decisions: overvaluing (undervaluing) firms with high (low) NOA. This leads to the, so called, NOA “anomaly” whereby firms with high (low) NOA experience negative (positive) future abnormal stock returns. They also provide evidence that NOA is a more comprehensive measure of investor's over-optimism about the sustainability of current earnings performance that captures information over and above than contained in working capital accruals and total accruals. They claim that NOA is superior to accruals because it captures all cumulative past changes between accounting and cash profitability, rather the most recent change.

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¹ Ou and Penman (1989), Holthausen and Larcker (1992), Lev and Thiagarajan (1993), Abarbanell and Bushee (1997) and Piotroski (2000) argue that various balance sheet ratios can be used to predict future stock returns. Sloan (1996) finds a negative effect of working capital accruals (change in net current operating assets minus depreciation) on future stock returns. A similar set of evidence is presented in Chan, Chan, Jegadeesh, and Lakonishok (2006) for components of working capital accruals, in Fairfield, Whisenant, and Yohn (2003) for long-term accruals (changes in net long-term operating assets), in Richardson, Sloan, Soliman, and Tuna (2005) for total accruals (change in net operating assets) and in Cooper, Gulen, and Schill (2008) for the asset growth rate. At the same time, Fama and French (2008) argue that the asset growth effect is of secondary importance since it is not observed among small firms, while Chan, Karceski, Lakonishok, and Sougiannis (2008) and Cao (2011); Carhart (1997) show that cash and those asset components financed by operating liabilities do not contribute to the asset growth effect.

The economic rationale of the predictive power of NOA for future stock returns is, however, still a controversial issue. Several explanations can be put forward, but the existing literature has not yet distinguished among them. An accounting-based explanation follows the opportunistic earnings management hypothesis²: high NOA could be exploited as managers manipulate earnings upwards (see Barton & Simko, 2002). High NOA may reflect high levels of account receivables as managers book sales prematurely and high levels of inventory as managers allocate more overhead expenses to inventory than to cost of goods sold (or fail to write down obsolete inventory). Similarly, high NOA could capture high levels of fixed assets as firm executives book inappropriate expenses to property, plant and equipment and intangibles or select depreciation/amortization schedules that are not based on the underlying useful life and salvage value of fixed assets. High NOA may also reflect low operating liabilities as firm executives reduce deferred revenues, warranty liabilities, accrued expenses or change actual assumptions and discount rates required for the estimation of pension liabilities. When earnings management reverses, the market is disappointed and downwardly revises its valuation. Xie (2001) and Chan et al. (2006) employ different models to decompose accounting accruals into their discretionary portion (i.e., unexpected portion driven by managerial discretion) and non-discretionary portion (i.e., expected or normal portion), and find that the discretionary portion predicts returns, but the non-discretionary portion does not. As such, the NOA anomaly could be driven by investors' misunderstanding of opportunistic earnings management.

There are four more competing explanations for the NOA anomaly. The first of them is based on the agency-related overinvestment hypothesis: NOA could be derived as managers invest in value-destroying projects to serve their own interests (similar to the arguments in Jensen, 1986). When the market learns that such expenditures dissipate value, stock prices tend to be corrected downwards. There is substantial empirical evidence that the market corrects its initial misunderstanding of information about overinvestment, as this information is recorded in various accounting measures of capital investment, as in the: (a) growth rate in capital expenditures (Titman, Wei, & Xie, 2004); (b) abnormal growth rate in capital expenditures (Wei & Xie, 2008); (c) total accruals (Dechow, Richardson, & Sloan, 2008); (d) asset growth rate (Chan et al., 2008); (e) abnormal asset growth rate (Titman, Wei, & Xie, 2009b). Thus, the NOA anomaly could be driven by investors' misunderstanding of overinvestment.

The other two explanations are based on the idea that the NOA effect may stem from the same patterns of investor behavior to other asset pricing regularities. In particular, one can follow the observation that a high NOA may contain adverse information about firm's business conditions. High NOA could reflect high levels of receivables as firms have problems in converting them into actual cash flow or compelled to offer more generous credit terms to support sales. Similarly, high NOA may capture high levels of inventory as a consequence of a relative slowdown in sales growth. High NOA could also reflect high levels of fixed assets as a consequence of replacement of obsolescent fixed assets or investment with transient payoff. According to Chan, Jegadeesh, and Lakonishok (1996), Abarbanell and Bushee (1998), Piotroski (2000) and Chan et al. (2006), investors often respond slowly or underreact, to information contained in various accounting measures. Thus, the NOA anomaly could arise as the market initially underreacts to adverse information about firm's business conditions and subsequently corrects this underreaction resulting in lower stock returns.

Further in this line, one can think that (by definition) NOA reflects all cumulative past changes between accounting and cash profitabil-

² Although the prevalent perception is that earnings management is utilized opportunistically by firm executives to enhance their own benefits, other studies argue that earnings management is beneficial because it enhances the informational content of earnings (see Jiraporn, Miller, Yoon, & Kim, 2008a; Jiraporn, Kim, & Mathur 2008b).

ity, which in turn tend to rise with sales. Firms with high NOA are more likely to have high past growth in sales. Lakonishok, Shleifer, and Vishny (1994), postulate that investors extrapolate the strong past growth rates of firms to form optimistic expectations about their future performance. When growth rates mean-revert in the future, investors are negatively surprised by the performance of growth firms. La Porta (1996), La Porta, Lakonishok, Shleifer, and Vishny (1997), Chan, Karceski, and Lakonishok (2003) and Chan and Lakonishok (2004) document empirical evidence consistent with investors' "errors in expectations" hypothesis. Insofar as high-NOA firms share common attributes with growth firms, they may also be subject to similar valuations errors and experience disappointing returns in the future.

The above hypotheses are not mutually exclusive and probably co-exist. Managers of firms that face a slowdown in business conditions may have additional motives to manipulate earnings upwards in order to meet analyst forecasts (see Iatridis, 2011; Iatridis & Kadorinis, 2009). Similarly, firm executives with "empire building" tendency may have additional motives to inflate earnings to be less likely subjected to market scrutiny (see Polk & Sapienza, 2009). These motives could be stronger as investors and analysts extrapolate past trends in growth rates to form expectations about future growth rates (see Chan et al., 2006).

The last possible explanation could be that high NOA firms are less risky than low NOA firms, and thus earn lower risk premia. Hirshleifer et al. (2004) argue that to the extent that NOA proxy for growth, its predictive power for future movements in stock prices could also reflect risk. This argument suggests that as firms increase their investment activity, thereby raising NOA, they face a less risky business environment.³ Recent theoretical papers also suggest that expected returns should systematically decline in response to increasing investment. Berk, Green, and Naik (1999) document that as firms invest, the importance of growth options relative to existing assets declines and consequently reduces equity risk. Further, according to the *q*-theory of investment (Cochrane, 1991, 1996; Li, Livdan, & Zhang, 2009 and Liu, Whited, & Zhang, 2009), firms respond to a reduction in cost of capital by increasing investment. Anderson and Garcia-Feijoo (2006) and Xing (2008) provide empirical support for the theoretical relationship. In this line, Wu, Zhang, and Zhang (2010) find after controlling for investment, the magnitude of the NOA effect on stock returns is reduced by more than 60%. In contrary, Li and Zhang (2010) show that limits-to-arbitrage proxies, rather than *q*-theory with investment frictions, are more appropriate in explaining the NOA effect in stock returns.⁴ As such, whether the NOA anomaly represents rational risk premium or market inefficiency is still debatable (see also a related discussion in Hirshleifer et al., forthcoming).

All the above combined lead us to focus on the NOA anomaly in order to get a deeper understanding of its underlying causes. In particular, we conduct a series of tests that address the merits of our essential motivation (distinguishing between these possible explanations) and clarify the nature of the NOA effect on stock returns. First, we examine whether different forms of net operating assets are related with future stock returns. For this purpose, we consider firm-level cross-sectional regressions of raw stock returns on NOA and NOA components – after controlling for total accruals (TACC) and investigate abnormal returns (size-adjusted returns and alphas from factor models) on portfolios based on the magnitude of NOA and NOA components. NOA are decomposed into net working capital assets (NWCA) and net non current operating assets (NNCOA), following

³ Callen and Segal (2004) derive a valuation model based on NOA to equity market value ratio.

⁴ Similarly, Titman et al. (2009a), Chen and Zhang (2010), Gray and Johnson (2011), Yao, Yu, Zhang, and Chen (2011), Lam and Wei (2011) and Lipson et al. (forthcoming) find evidence against a risk-based interpretation for the negative relation between accounting measures of capital investment (growth rate in capital expenditures, asset growth rate) and stock returns.

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