

# Analysis of risks and investments' opportunities in water sector

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## Abstract

While water demand is projected to grow by 41% by 2030, considering also the ultimate reserves of drinking water, it is believed that this element will attract the majority of investments in the coming decades.

Opportunities in drinking water sector are numerous, because its process of providing and delivery of drinking water includes many aspects: management of infrastructure, design of technological solutions, conservation and water's quality.

These opportunities result from the difference between water supply and water demand; an increasingly difference that requires capital investments in production and water treatment technologies. Investments need to be combined with the knowledge on the legislation, regulatory framework and technological developments.

This article may serve to clarify type of investments in drinking water sector, known by literature, to identify opportunities of investment in this sector, indicating the theoretical framework of beta and alpha risk ratio coefficient calculation and to suggest how these types of investments can be allocated to the investment portfolios.

**Keywords:** opportunities; investment portfolio; water sector; beta; alpha; allocation

## Introduction

Investment in drinking water sector appears to be a multi-year opportunity supported by multiple promoters. As a necessary resource, drinking water has a finite amount, without a substitute good and its demand increases significantly more than the supply, the latter "threatened" by the pollution and degradation of natural water resources. Based on literature, it is proved that water demand increases more than population growth rate, historically twice as population rate and is expected to go to 41% by 2030.<sup>1</sup>

Drinking water is essential for life and critical to global economic prosperity as key input in many industries. Today, more than 800 million people don't have access to drinking water service and 2.5 billion to basic sanitation services<sup>2</sup>. It is estimated that if the provision of drinking water is not addressed properly, 45% of the global planned

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<sup>1</sup> www.fao.org, Dimensions of need – water: a finite resource.

<sup>2</sup> WHO and UNICEF, "Progress on Drinking Water and Sanitation," 2012

GDP would be at risk (about 63 trillion \$). If are applied sustainable solutions to water resource use, about 17 trillion \$ GDP can be saved, not to mention the most important fact that 1 billion people will be facilitated by the service of providing drinking water<sup>3</sup>. Globally, there are about 214 river systems shared between several countries and around 273 water sources remaining within their bounds. Increased access to drinking water services will increase the possibility that these resources are used badly or even be degraded<sup>4</sup>.

To avoid the risk of water resources depletion, are thought to carry out about 12 trillion \$ investments for 2015-2030, interfering in global infrastructure, the largest of the investments in railways, ports, energy sector taken together<sup>5</sup>.

This intervention would have become more effective in coping with the anticipated demand for drinking water, if the investment alternatives in this sector would be easily identifiable, because investors find it hard to see part of their investment portfolios, assets associated with this sector, even more by buying globally competitive assets in return and risk.

However, investment specialists for investment alternatives in water and sanitation sector suggest that investors have access to:

- Depleted natural resources;
- Growing economic markets;
- Investment in infrastructure;
- Purchase and merger of utilities in drinking water sector.

From the perspective of building portfolio, securities of the drinking water sector are seen as a potential source of long-term growth. Investors have used these types of investments related to the allocation of water resources in industries and sectors where water is a significant component of the infrastructure and production, or treated as a real asset in the allocation of natural resources.

The article will summarize the possibilities of investment in drinking water sector, by identifying investment's opportunities in this sector, indicating the theoretical framework of beta and alpha risk ratio coefficient's calculation and suggesting how these types of investments can be allocated to the investment portfolios.

## **Water Opportunity**

More than energy or fuels, water is essential to the existence of human life and the economy on the planet. Less than 3% of water resources are fresh and approximately

<sup>3</sup> Bank of America Merrill Lynch, A Blue Revolution – Global Water, December 2012

<sup>4</sup> Bank of America Merrill Lynch, A Blue Revolution – Global Water, December 2012

<sup>5</sup> McKinsey & Co, "Infrastructure Productivity", 2013

0.5% of all reserves of natural water are available for the man (2.5% in Antarctica, in the Arctic and glaciers and the rest in the seas and oceans). Water is a non-renewable and irreplaceable source, and there aren't new sources of fresh water for use. About 60% of available water resources are owned by 9 countries: America, Canada, Brazil, Russia, China, Indonesia, India, Colombia and Democratic Republic of Congo. North America has 8% of the world population and 15% of the drinking water supply, while China has 21% of the world population and has access only to 7% of the global supply of drinking water.

Drinking water supply has some major challenges due to overcrowding, the expansion of agriculture and industry, and pollution or climate changes.

- Agriculture and industry are the biggest polluters of water resources through the use and disposal of chemicals;
- Climate changes in recent years are affecting the weather and the quality of natural water resources;
- About 33% of the world population lives in overcrowded areas that don't have enough supply of drinking water ("water stressed" areas);
- About 1 billion people don't have access to drinking water service (this figure is expected to double within 20 years);
- 3-4 million people die each year in developing countries from diseases caused by contaminated drinking water.

Agriculture is the most extensive consuming sector of water resources, using around 70% of the world's water supply, and in many cases in a very inefficient way. In developed countries, the industrial sector is the largest consumer of water, turning many residential areas as areas with shortages of drinking water service.

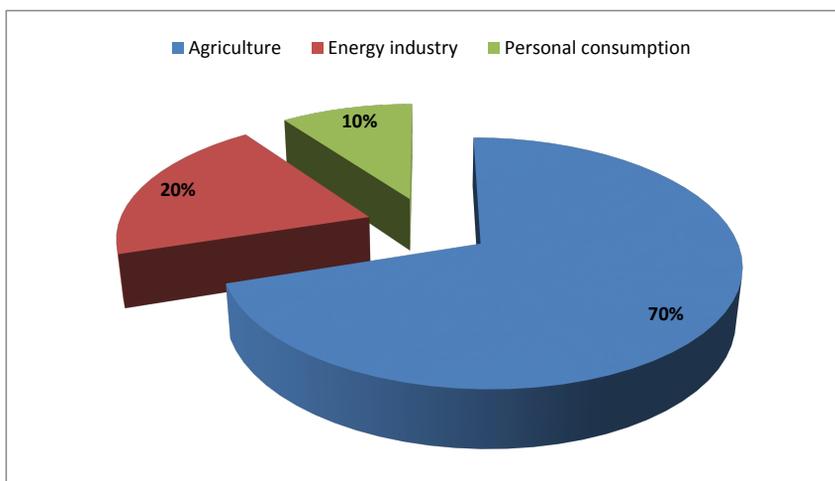


Figure 1: Consumers of drinking water, world rate  
Source: NASDAQ OMX, 2012

Considering the depletion of drinking water and natural resources, many consumers are under pressure to improve the use of water sources, without having to limit productivity of economic growth. In America and other industrialized countries, there are about 15-20% of water losses in the network because of technical terms of used pumps. In developed countries, this percentage is increased to 40% due to illegal connections to the network or unidentified customers (customers who have not signed a service contract with any water supply and sanitation utility). Based on a growing demand for clean drinking water, and a need for investment, projected to be about 1 trillion \$ globally in the sector, investors can identify a variety of investment opportunities in the sector.

Considered as a market, the water sector is increasing constantly. Water "market" consists of water production and water treatment chain, distribution network, infrastructure and monitoring.

Its value is estimated to be 500 billion \$ globally. Total capital expenditures (CAPEX) are known as funds used by companies to undertake new projects or investments. In the figure 2 it's shown the regional CAPEX growth rate of companies that operate in water industry, in different regions, during 2013-2015. This parameter is expected to grow at a rate of 6.2% during 2010-2016<sup>6</sup>.

Water is considered as a safe, long-term investment and literature and reports also show that companies operating in this sector are characterized by slow economic growth but stable. Although the sector is sensitive to changes in terms of the legal and governmental regulations or the volatility of the industry and agriculture (two of the biggest consumers of water resources), generally, the increasing trend in this sector is seen as a long term.

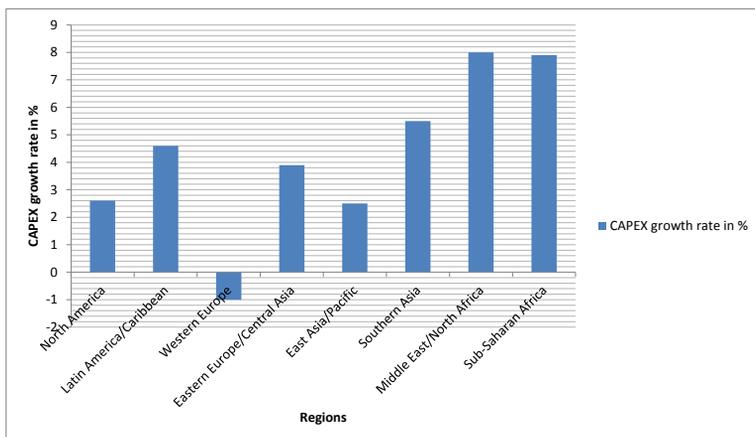


Figure 2: Capital expenditures (CAPEX) growth rate (in %) on water supply and sanitation services, in different regions, during 2013-2015

Source: GWI, 215

<sup>6</sup> GWI (Global Wellness Institute) Research, 2015

## Water's Beta and Alpha Identification

There are difficulties in the field of investment on drinking water. Firstly, there is a not well-defined sector of drinking water, so that investors understand the group of companies that have exposure to service provision of drinking water (not necessarily significant). It's considered as a sector with around 300-400 companies. Secondly, water indexes have been developed, but they include a limited number of companies due to the specifics of the index in question, the volume of production, the company's size, liquidity, etc.

By eliminating the limitations on the construction of the index, a set of securities of these companies would have been a good indicator to identify the leading companies in the sector. Kleinwort Benson Investors defines the sector depending on the water cycle, which describes the flow of water:

- From the source;
- Through distribution network;
- The distribution of service points;
- Through the network of sewage treatment used;
- Up to return to the environment again.

Companies operating in this field are grouped into three sections:

- Utilities Water and sanitation;
- Water Infrastructure;
- Water Technologies.

To be included in the sector companies must meet income criteria as follows:

- Ensure 50% of revenues from the main activity: water;
- Minimum income from the water to be 10% for a leading company in product, service and technology.

Currently there are 150 titles securities traded, with a market capitalization over \$ 490 billion. This sector appears with its own dynamics; new companies are added and some of them drop out because the changes occurred is not affordable for them or income from water fall below the limit to be operating in this sector. As shown at figure 3 water has outperformed the broader global markets.

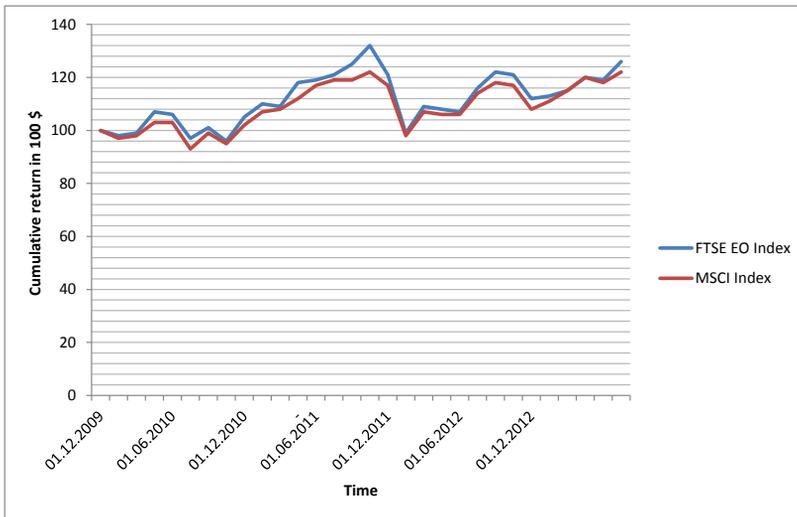


Figure 3: The FTSE Environmental Opportunities (EO) Water Technology Index<sup>7</sup> returned 26.68% (cumulative) compared to the MSCI World Index<sup>8</sup> return of 22.28% (cumulative).

The return period is January 1, 2010 through December 31, 2012.

Source: FactSet, 2012

What about beta and alpha risk ratio indexes?

As known, beta represents the tendency of a security's returns to respond to swings in the market. Intelligent investors ought to consider how closely that security might track to the market. Beta is a measure of co-movement, not risk. Instead, it is a relative risk measurement tool. There is strong evidence that betas are less stable for individual securities, and that as the size of the portfolio increases, beta's stability also increases, reflecting the effects of diversification (Alexander and Chervany, 1980).

Alpha, often considered the active return on an investment, gauges the performance of an investment against a market index used as a benchmark, since they are often considered to represent the market's movement as a whole. Alpha is often used with beta, which measures volatility or risk, and is also often referred to as "excess return" or "abnormal rate of return."<sup>9</sup>

<sup>7</sup> The FTSE EO Water Technology Index represents the performance of global environmental opportunities (EO) companies ranked by full market capitalization in the water technology category of the FTSE Environmental Markets Classification System. Investors cannot invest directly in any index.

<sup>8</sup> The MSCI World Index consists of the following 24 developed market country indices: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States. Performance for the MSCI World Index is shown "net," which includes dividend reinvestments after deduction of foreign withholding tax. Investors cannot invest directly in any index.

<sup>9</sup> Investopedia.com

With intention to estimate the beta of portfolio that includes securities from water industry, the literature suggests the need of a list of returns for the asset and returns for the index; these returns can be daily, weekly or any period. Then one uses standard formulas from linear regression. The slope of the fitted line from the linear least-squares calculation is the estimated beta. The y-intercept is the alpha.<sup>10</sup>

ETFs (Exchange Traded Funds) offers a potential investment approach, are liquid investments with very low additional cost. However, due to the large volume of transactions required, these investment funds are dominated by extensive and liquid company, while other companies have securities with lower capital expenditures and growth opportunities in new technologies.

Building a portfolio with securities of this sector should be after identification of sector specifics. The goals are:

1. Minimizing costs, optimizing investment options, operating systems and treatment water production more efficient and “chasing” after the investment cost-optimization;
2. Maximizing inflows from investments, providing a constant source of water, or treatment, or network lost associated with financing capacity;
3. Improving the ability to analyze a wide range of alternatives (alternatives for traditional (or not) infrastructure) and decentralized systems to better serve the population.

Water stocks offer exposure to growth and alpha index; mixing water with other equity strategies can ensure a more *diversified, risk-efficient returns*. The table 1 shows at the correlation's coefficients of excess returns of water above MSCI World Index relative to other market's areas that are known for rapid growth rate:

Correlation Coefficients	MSCI World Growth	S-Network Global Water Index	Dax Global Agribusiness	MSCI ACWI Info Tech	MSCI ACWI Pharma & Biotech
MSCI World Growth	1.00				
S-Network Global Water Index	0.19	1.00			
Dax Global Agribusiness	0.38	0.09	1.00		
MSCI ACWI Info Tech	0.48	0.12	0.00	1.00	
MSCI ACWI Pharma & Biotech	0.08	-0.08	-0.25	-0.24	1.00

Table 1: Correlation of excess return above MSCI World Index return, December 2004 – December 2014  
Source: “Investing in Water: Accessing a Compelling Opportunity”, Kleinwort Benson Investors

<sup>10</sup> Scholes, Myron; Williams, Joseph (1977). "Estimating betas from nonsynchronous data". *Journal of Financial Economics* 5 (3): 309–327. doi:10.1016/0304-405X(77)90041-1

When composing a portfolio of investments, we should look for negative correlation coefficients of S-Network Global Water Index with other market's areas such as: MSCI ACWI Pharma & Biotech. The less correlated are the stocks with water's stock, the lower is the overall risk of the portfolio.

### **Water Sector in Developing Countries**

In developing countries, this sector is managed by municipalities and communes. This fact is characterized by several features:

1. Provide drinking water service or sewage systems is a vast social enterprise. Operating costs of the activity, sewerage system of distribution lines and distribution networks, pumping stations or treatment systems of used water, land and territories that support this activity make one of the larger "industries" in industrialized countries. Water fee payments (direct or indirect service tax), occupy a significant portion of the family budget. A part of these assets "owned" by families as a public good, are part of the whole, often with state organization form and are not easily commercial.
2. Providing the service of drinking water and sanitation is a top venture capital commitment. In many cases there are achieved economy of scale, physical capital tends to be long-term. The decision for capital investment in this sector must be careful because of the overlapping investment risk, being first request, in building unnecessary facilities or those with capital-intensive consumption. Financing of capital expenditures, is substantial debate in this sector. This makes it necessary the clarity of private property rights to private entities for taxpayers to feel safe in undertaking these investments.
3. Demand of families and individuals to small amounts of drinking water is very inelastic with respect to price, because drinking water is necessary for living. In the absence of drinking water, the highest priced service is marked (in Tanzania or Mozambique, the cost of buying a liter of drinking water exceed four times the cost of providing it, World Bank). Inelastic demand for drinking water makes that anyone can achieve big profits if meets the objective of profit maximization as a monopoly, than the objective of social welfare. No wonder that in developing countries these entities are in the hands of weak governance with high level of corruption (Lovein and Whittington, 1993; Davis, 2004).
4. From a technological perspective, water is different from electricity when it comes to storage or transport. Saving is easy, while its distribution in large distances between urban and rural areas is with high cost. Energy, in contrast has its preservation very expensive while distribution is simple.
5. There is a correlation between the range of coverage of drinking water service and sewage service and household income. If incomes rise in developing countries, more and more families receive improved service (Komives et al, 2002).

## Conclusions

1. Investing in drinking water utilities can provide substantial, stable and long run returns, contributing in a meaningful way in the investor's asset allocation.
2. Factors that affect long-term financial returns among other things include the limitation of natural water resources, and emerging markets or capital expenditures, which affects the beta of these types of investments.
3. Specialists of portfolios of financial assets with the involvement of the sector should identify companies exposed to growth trends, which have a wide supply of products and have the potential to add value on the return. Building a portfolio with securities of this sector should be after identification of sector specifics.
4. Some investors choose to use stocks of the water sector as liquid investment alternative. Once allocated to the best investment in a portfolio, it multiplies the long-term safe returns.
5. Water stocks offer exposure to growth and alpha index; mixing water with other equity strategies can ensure a more diversified, risk-efficient returns. When composing a portfolio of investments, we should look for negative correlation coefficients of S-Network Global Water Index with other market's areas. The less correlated are the stocks with water's stock, the lower is the overall risk of the portfolio.

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