A SLICE OR THE WHOLE CAKE? NETWORK OWNERSHIP, GOVERNANCE AND PUBLIC-PRIVATE PARTNERSHIPS IN FINLAND

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ABSTRACT

This paper analyses PPP projects within the framework of different ownership and governance (O&G) models of technical infrastructures. The O&G models in Finland are described and the market layers of ownership, operation, and services are studied. All infrastructures have somewhat different O&G structures and they each have a different market context, not least based on ownership and the market structures that are “on” the infrastructure. Private companies, public companies, state and municipality owned enterprises and purely public-authority-type models can be found. Interestingly, the models seem not to affect too much on the cash-based returns to the owners. However, the market structures will probably provide varying prospects for PPPs to be carried out, whether the PPPs are traditional projects or outsourcing of formerly public functions. The financial return capacity of the infrastructure is playing a key role. Some infrastructures have already a tradition of “good business” while others are considered as public goods on more or less sustainable grounds. The results show how on one hand there are natural markets for PPPs as project procurement options and on the other hand where the market structure does not provide good spring board for public-private partnerships. The paper gives a topology for different market structures and the PPP feasibility.

Keywords: infrastructure, ownership, governance, public-private-partnership

INTRODUCTION, OBJECTIVE AND SCOPE

Shortage of capital to finance society’s infrastructure networks (roads, and streets, waterworks, ports, railways and airports) has resulted in new proposals for organizing,

governing and financing these networks all over the world. New ways of thinking, such as New Institutional Economics with its roots in Coase's work (1998), have inspired numerous studies on organizational arrangements of public institutions (see e.g. Eggertsson 2005).

Project finance is an example of pragmatic applications of institutional economics using public-privatepartnerships (PPP) and other unconventional financing models. Leviäkangas (2007), presents a good review on project finance and Välilä (2005) for PPP. There is copious literature on project finance, on whether PPP is more economical than conventional procurement, see for example Leviäkangas (2007), Blanc-Brude et al. (2006), Shaoul et al. (2006), and Kain (2002). However, institutional arrangements have not previously been studied systematically, except some isolated privatization cases. Privatization has been analyzed by many authors, e.g. Mees (2005) in Australia and Kay (1993) in the UK. Restructuring and institutional arrangements and their evolution have also been a major issue that has been discussed, but the discussion has been sector and mode-specific - see e.g. Talvitie (1996) for road sector and Leviäkangas (2000) for the railways.

Also in Finland, the State and municipal governments are seeking ways to reduce costs, improve efficiency and enhance customer orientation in public service delivery. Infrastructure networks in particular, are experiencing strong pressures to reduce their costs, also in Finland. Various means and arrangements are attempted to lower the costs to administer, manage, provide access and supply the services. Governance can be seen as the common denominator for these development actions. Most of the infrastructure networks in Finland are owned and managed by local municipal governments, or the State. Finland has not experienced liberalization and privatization comparable to the Anglo-Saxon countries. Organizing some infrastructure services as companies owned by state or municipalities has, however, taken place. Infrastructure networks and services are often monopolies, but many services can be, and are purchased from the private market, i.e. design, operation, construction, maintenance and management services.

This paper analyses PPP projects within the framework of different ownership and governance (O&G) models of technical infrastructures. The O&G models in Finland are described and the market layers of ownership, operation, and services are studied. All infrastructures have somewhat different O&G structures and they each have a different market context, not least based on ownership and the market structures that are "on" the infrastructure. Private companies, public companies, state and municipality owned enterprises and purely public-authority-type models can be found. Interestingly, the models seem not to affect too much on the cash-based returns to the owners.

However, the market structures will probably provide varying prospects for PPPs to be carried out, whether the PPPs are traditional projects or outsourcing of formerly public functions. The purpose of this paper is to analyse what type of market structures and O&G models could facilitate different types of PPPs well, and which combinations might not work that well.

The paper relies on empirical material gathered in C-Business project financed by the Finnish Ministry of Finance, Finnish Ministry of Transportation and Communications, Finnish Transport Agency, Finnish Association of Municipalities, Helsinki City Transport, City of Oulu, Destia Ltd., Pension Fennia and European Investment Bank. The research was conducted during 2007-2010. The method of research is based on descriptive analysis on ownership models and market structures of different networks and a cash-based investigation of financial statements.

Due to its strict empirical nature and positivistic approach, the value added comes from the empirical observations and quantitative analysis of financial returns of different infrastructures. We believe this is the first time when transport infrastructures are compared in this way together with other basic technical infrastructures of the communities.

BASIC MODELS FOR INFRASTRUCTURE OWNERSHIP AND INFRASTRUCTURE MARKET ARCHITECTURE

There seem to be no comprehensive studies addressing the question of different types of Ownership and Governance (O&G) models and the related technical-economic risks. There are no existing analyses on the pros and cons of different models. The variety of O&G models observable in Finland may well be the result of case-specific thinking for different infrastructure sectors. Table 1 presents the existing O&G models, which can be categorized in six basic models:

1. Traditional O&G model: the ownership and governance is done within public administration following the public sector regulating legislation and accounting.

2. Municipality- or State-Owned Enterprise models (MOE/SOE): legislation is used to establish business or entrepreneurial entities and practices with the objective of self-sustaining cost recovery. MOEs or SOEs are not corporate tax liable. There are three variants: i) client MOE or SOE acting on behalf of the public; ii) supplier MOE or SOE, carrying out operational tasks for the public; iii) co-operative MOE (co-owned or merged unit of several municipalities)

3. Municipality- or State-Owned Company model: MOC or SOC can be either the client or supplier part of organization, but usually the latter. These entities, legally established, are self-supporting and pay full corporate and value added taxes and follow established accounting practices as any limited company.

4. Private Cooperative or Association: This is an entity formed by a group of autonomous persons to meet certain service needs of its members.

5. Private Companies, the purpose of which is to deliver the produce according to the demand and increase the wealth of its shareholders.

6. PPP model: public-private-partnership model: The municipality or state and a private contractor enter into a legally organized partnership. The rewards and risks are shared.

A cooperative is owned by its members, who usually are the customers of the service. Both the road and water sectors have a private cooperative model. The road cooperative model can receive government grants for capital expenditures. Many municipalities provide financial support for maintenance of private road associations as a service to the residents in the community.

Table 1 - Ownership and governance models of Finland's infrastructure networks (Leviäkangas et al. 2011)

Network or node		Ownership	Governance model
Transport	Public roads	State	Mandated infrastructure administrator and manager; from 2010 onwards Finnish Transport Agency, before that the Finnish Road Administration
	Streets and communal roads	Municipality / city / private road association	Mandated department of the municipal government, a private road association, or a municipal-owned enterprise.
	Rail network	State	Mandated infrastructure administrator; from 2010 onwards Finnish Transport Agency, before that the Finnish Rail Administration
	Ports	Municipality / city/private	Municipal-owned enterprise or municipal-owned company or department in the municipality administration / private limited company
	Airports	State	State-owned company
Municipal infrastructure networks	Water & sewage	Municipality / city	Municipal-owned enterprise or municipal-owned company or department in the municipality administration, or a cooperative
	Local electricity	Municipality / city or private	Municipal-owned enterprise or municipal-owned company or private limited company
	Local telecommunications	Private	Private limited company or a cooperative
	Heating	Municipality / city or private	Municipal-owned enterprise or municipal-owned company or a private limited company
National transmission grids or networks	National electricity gridlines	Private (the state has a minority share)	Private limited company
	Telecommunications	Private (the state has a minority share in some)	Private limited company

The ownership issue is just one side of the story. What takes place in the market *on* the infrastructure and *around* it is not irrelevant, but on the contrary. Furthermore, there are multiple "market layers" each of which function differently and function as a market of their own. On transport infrastructure, the passenger and freight operators exercise their business and citizens fulfil their mobility needs. Infrastructure services, building, maintaining, servicing, designing, even financing, are all their specific market segments which have their own logic

and structure. So far, PPP research has been focusing on project delivery that really represents a minor piece of the whole architecture of infrastructure market layers. One could say that the focus has been on technical procurement details rather than on holistic aspects of infrastructure supply.

Figure 1 describes these "market layers". Infrastructures must be owned, governed, managed, built, maintained and used. The ultimate benefit comes from conveying the people and goods, obviously. Mainstream PPP research has studied mainly the issues covering the ownership and management functions. The capital markets serve infrastructure ownership function by supplying financial resources and offering trading platforms. The whole regulatory system sets boundaries on the ownership issues. Once owned and regulated and built by service providers (contractors), somebody has to manage and maintain the infrastructure. Usually the former is done by public bodies mandated for this, which in turn utilise the supply of maintenance service providers. The "operator and user market" defines how the actors utilising the infrastructure are able to access and move on the infrastructure. Transport economics has traditionally been focusing on this topic, treating mobility as a market produce the use of which is in more or less efficient equilibrium.

What is typical is that each layer has mostly been researched and analysed separately, as if they did not interact with each other.

Function	*Markets*	*Potential problems*
Delivery and use of produce	End user market	Pricing and cost recovery
Use of infrastructure	Infrastructure user market	Pricing of infrastructure access and use, externalities
Infrastructure services (e.g. maintenance)	Service market	Monopolies, oligopolies
Management & operating of infrastructure		
Ownership	Capital market, public service obligations	Efficiency of the market, access to information, risk pricing
Regulatory system	Legislation, governance policies	Subventions, redistribution of wealth, taxation

Figure 1 – Infrastructure market architecture with potential problems

BUSINESS OR PUBLIC SERVICE? – RETURNS RETRIEVED FROM INFRASTRUCTURES

Data and sample

Infrastructures provide business opportunities in each of the actors involved: financiers, service providers, operators, etc. Ownership can bring real cash flows (private owners) or just public good (public owners). However, even public ownership is translating into cash generation centric thinking, emphasising the cash flow potential also to public owners. There are numerous examples of this, and the transformation is partly a result of New Public Management or New Institutional Economics setting. One important internal driver for this is the managerial incentive and control system that is put in place across the public sector throughout Europe and the world.

When management is evaluated against financial and/or economic indicators the pursuing of financial/economic impacts are a natural result. When this is combined with micro-management of individual entities, the development to this direction is accelerated. The observation for this can be made from Figure 2. The more emphasis is put on market-based ownership and operation of infrastructures, the more vital become the financial and economic aspects *per se*.

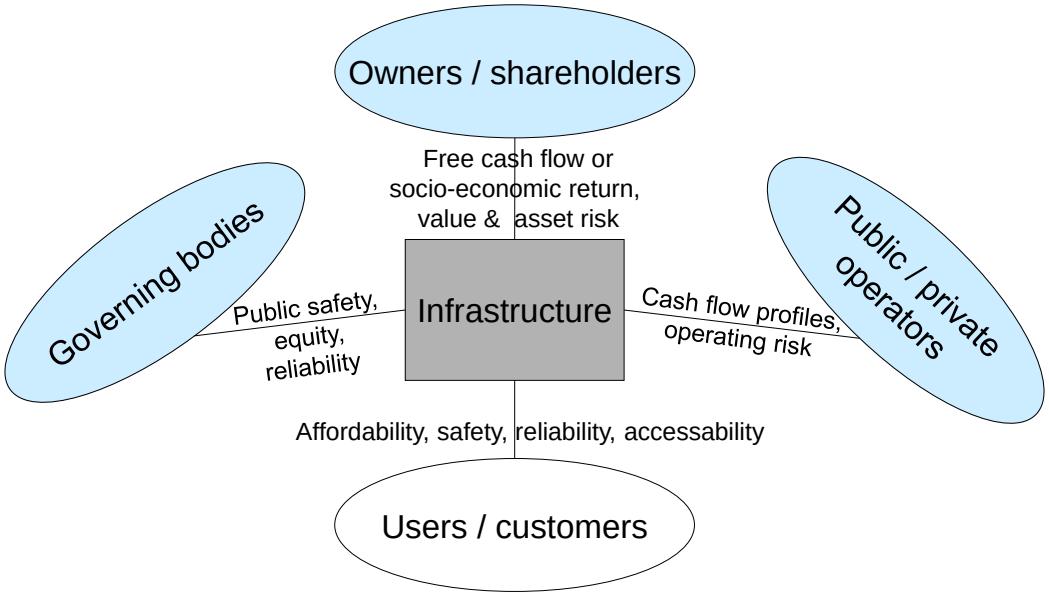

Figure 2 – Business and social aspects of infrastructure ownership, operation and use

Infrastructures provide returns to the owners and investors, whether these are private or public. The financial analysis of Finnish transport infrastructures is based on publicly available financial information, that is income statements and balance sheets, which build the core data from which all the profitability and return ratios are calculated. The O&G models

cover all the aforementioned, except the fully public administrations that do not publish transparent financial statements based on accrual accounting.

The key instruments for examining profitability in the financial analyses of listed companies are cash flow statement (free cash flow), key profitability and risk ratios (e.g. return on investment ROI, return on assets ROA, and return on capital invested by the municipality ROCIM). With the exception of ROCIM, all the indicators apply to all types of entities, independent of their ownership model, provided that financial statements are available. This terminology is explained in the appendix.

We applied the analysis to the entities listed in Table 2. It is worth noting that some entities perform services on the infrastructure and are not necessarily involved in the ownership of the network in any way. The non-transport networks are included for the sake of comparison, since these are likewise basic technical infrastructures for all communities.

For energy and water, both the infrastructure and the "good" it delivers (water, electricity) are included in the entities, making them integrated in terms of infrastructure – operations – delivered produce. For railways, the state-owned operator is a service provider *on* the infrastructure in the sense explained earlier. Destia Ltd. is the state-owned road contractor and maintenance service provider.

There are several limitations to the analysis that should be noted:

1. Due to the small sample size, the analyses presented are not statistically significant for all sectors or industries; however, for certain segments, like railways and ports, the sample covers a good deal – actually 100% for railway operations and the lion's share of port freight volumes in the country.

2. For unlisted entities application of financial ratios may not always yield to straightforward results.

3. Adjustments to income statements and balance sheets are kept to minimum, because not all studied entities provided equally comprehensive information.

4. Analyses are presented as ex-post, and therefore do not automatically provide a picture of the future financial position of the entity.

5. Some entities paid no taxes or this information was omitted from their financial statements.

In those cases and years where no tax payment has taken place the tax rate has been adjusted to zero. The principle of the smallest mutual denominator has been applied in analysing the data. The aim is to make the companies as comparable as possible, but at the same time, where applicable, make the same adjustments apply to all the companies. The adjustments that have been left out may have a minor effect on the result. The aim of the minor adjustments and simplifications was to render the results comparable and fair across all the entities. For the entities analysed, the main assumption is that the companies have

made their income statements and balance sheets according to standard practices and that the information is reliable.

Table 2 - Entities included in financial analysis (Leviäkangas et al., 2011)

Industry	**Owner-ship**	**Company**	**Number of cases**
Ports	MOE	Port of Oulu	9
		Port of Kemi	
		Port of Helsinki	
		Port of Turku	
		Port of Kokkola	
		Port of Vaasa	
		Port of Hanko	
		Port of Pori	
		Port of Rauma	
	MOC	Port of Kotka	2
		Port of Hamina	
	P	Inkoo Shipping	1
Water-works	MOE	Haukipudas waterworks	5
		Oulu waterworks	
		Helsinki waterworks	
		Espoo waterworks	
		Vantaa waterworks	
	MOC	Kempele waterworks	4
		Lakeuden keskuspuhdistamo	
		Lahti Aqua	
		Hämeenlinna area waterworks	
	P	Ylivieska waterworks co-operative	2
		Pudasjärvi waterworks co-operative	
Railway	SOC	VR-Group Ltd. (rail transport)	1
Airports	SOE/SOC	Finavia (airport infrastructure & services)	1
Roads	SOC	Destia Ltd. (road maintenance & construction)	1
Energy	MOE	Oulun energia	2
		Helsingin energia	
	MOC	Jyväskylän energia[3]	1
	SOC	Fortum Corp.	1
			Total 30

The O&G types and industry classification are as shown in Table 3a and 3b.

Tables 3a and 3b - Entities included in financial analysis (Nokkala et al., 2011)

a)

Ownership	Number of cases
MOE	16
MOC	7
SOE	1
SOC	3
P	3
Total 30	

b)

Industry	Number of cases
Ports	12
Waterworks	11
Railway	1
Airports	1
Roads	1
Energy	4
Total 30	

The following data was missing from the analysis:

- The Port of Hamina has been a municipality owned company (MOC) since 2002, so it does not have an income statement or balance sheet for 2001. Also it had not published its 2009 financial statements by the time data analysis began.
- Vantaa Waterworks has been a municipality owned enterprise (MOE) since 2002, but as its opening balance sheet for 2002 was available, it was used as a basis for 2001 information.
- Finavia's 2009 financial statements were ignored, because Finavia changed from a state owned enterprise (SOE) to a state owned company (SOC) in 2010, and the 2009 financial statements include major depreciations and reductions.

The analysis covered the period 2002–2009, unless otherwise indicated, utilising financial statements from these years.

Results – the returns from the infrastructure or infrastructure related business

Figure 3 presents the average free cash flow for the companies for the period 2002 to 2009. Free cash flow shows the entities' available cash against its net sales. In our analysis, a free cash flow to net sales ratio above 20% is considered a good financial position, a cash flow of 0–20% is considered a satisfactory position, and a negative cash flow is considered a weak cash position. As the figure shows, in our sample of 30 companies 6 have a good cash flow position, whereas 12 have a poor cash flow position.

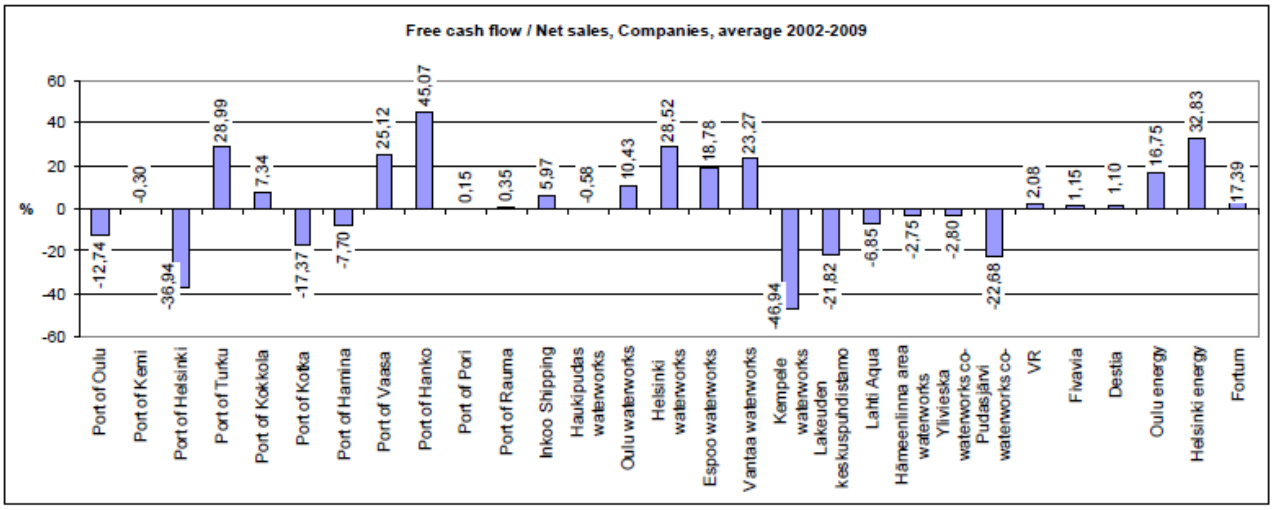

Figure 3 - Free cash flow / net sales

Some explanatory notes are needed to understand the results above, given that the data is the average over 8 years. The negative cash flow of the port of Helsinki is mainly a result of port construction at Vuosaari over the period of analysis. Kempele waterworks, Lakeuden keskuspuhdistamo (water supply as well) and Pudasjärvi waterworks co-operatives have a negative free cash flow over the period, which is explained by an increase in investments during the first half of the period of analysis. Obviously for each entity there have been fluctuations between years, but the average does provide a relatively representative picture of the entity's overall performance.

In Figure 4 our sample is grouped by industry/infrastructure: railway (VR), roads (Destia), and airports (Finavia) each represent only one national level entity. The best performing industry/infrastructure is energy, where all companies combined have a satisfactory level of cash flow.

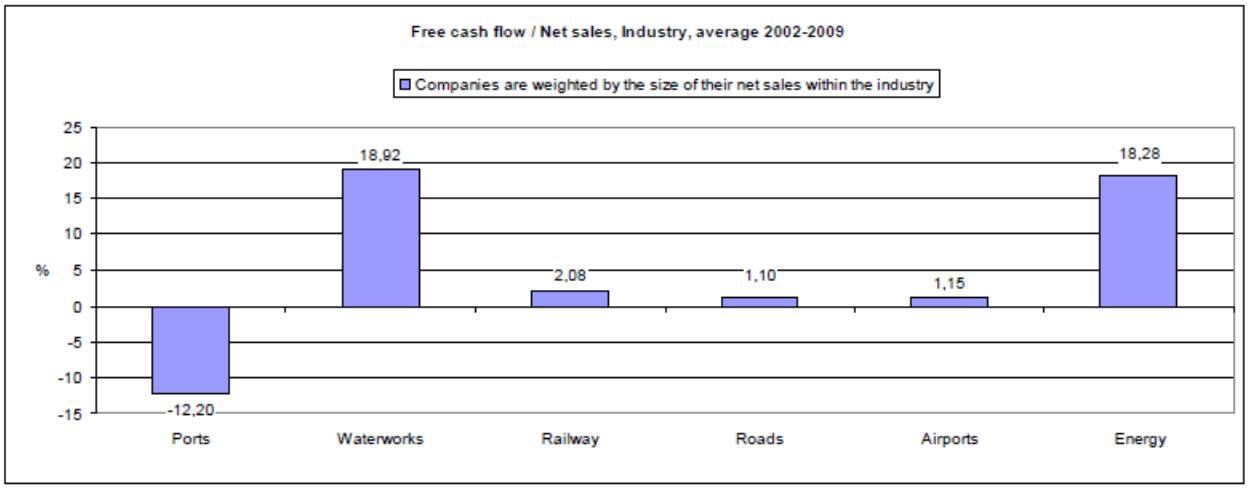

Figure 4 - Free cash flow / net sales per infrastructure/industry

Figure 5 shows free cash flow grouped by ownership model. The MOE grouping consists of ports, waterworks, and energy utilities, and most of them have positive free cash flows. The port of Helsinki has a large negative free cash flow due to the large investment as part of the Vuosaari port financing. MOCs consist of ports, waterworks, and one energy company, all of

which have negative free cash flows. The private entities consist of two private waterworks co-operatives and one private port, a limited liability company. The latter did have a positive free cash flow, but the waterworks cooperatives had a negative one. Interestingly, MOEs seem to outperform all other ownership models, contrary to common beliefs. When we weighed the results with the size of the entities in terms of net sales, the same pattern is even clearer (Figure 6).

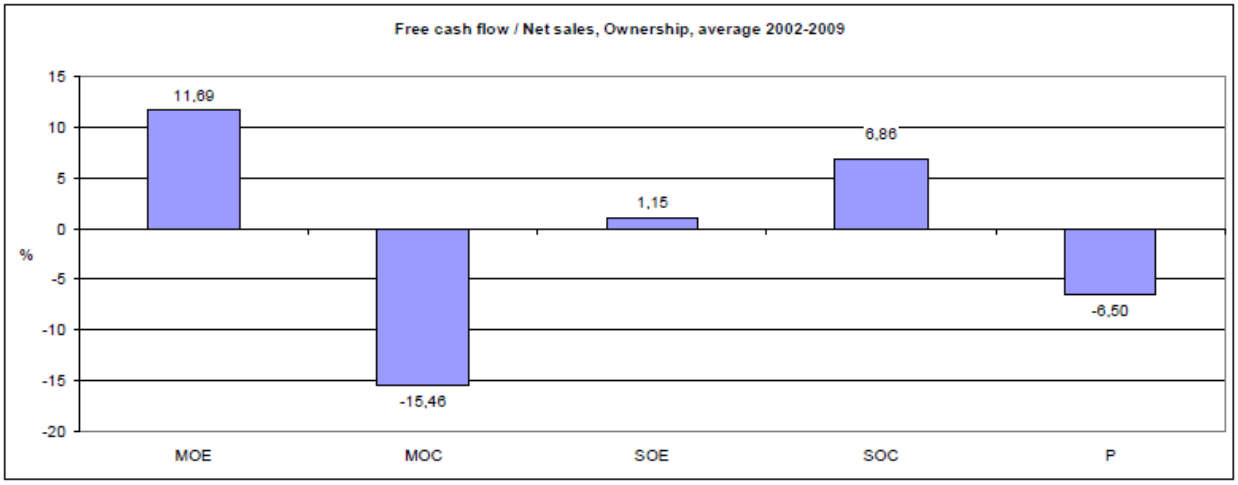

Figure 5 - Free cash flow / net sales per ownership model

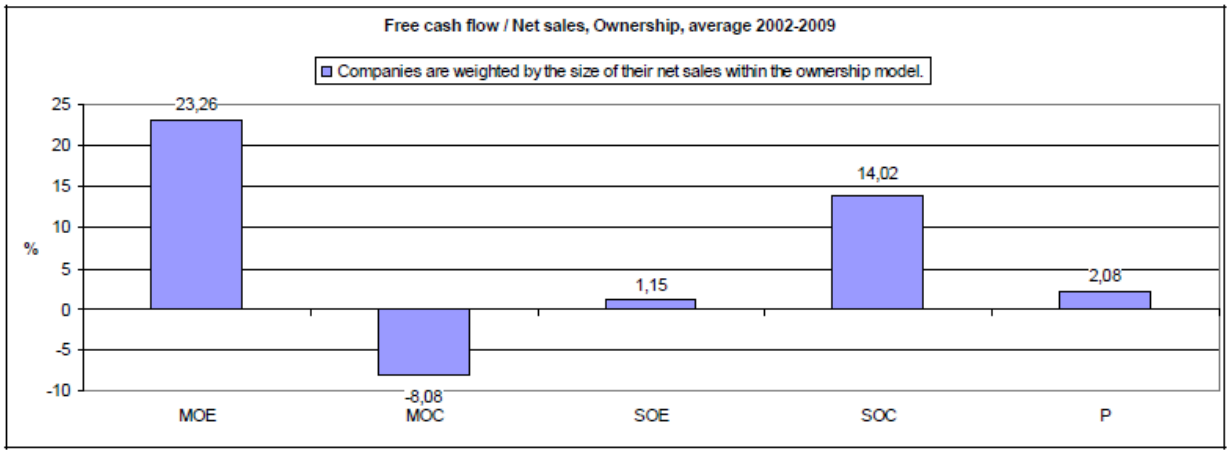

Figure 6 - Free cash flow / net sales per ownership model, weighted by the amount of sales

Figure 7 shows the performance of sample entities by industry and ownership. The best performers are energy MOEs. Poor performance is observed in port MOCs, waterworks MOCs, and private waterworks. The size of the sample means that groups have only a few entities each, so drawing any definite major conclusions is difficult, especially due to different tax treatment of various models, i.e. MOEs vs. other corporate structures. In the cases where the MOE has made a large positive cash flow, non-taxation can lead to a substantial increase in the funds provided back to the shareholder(s).

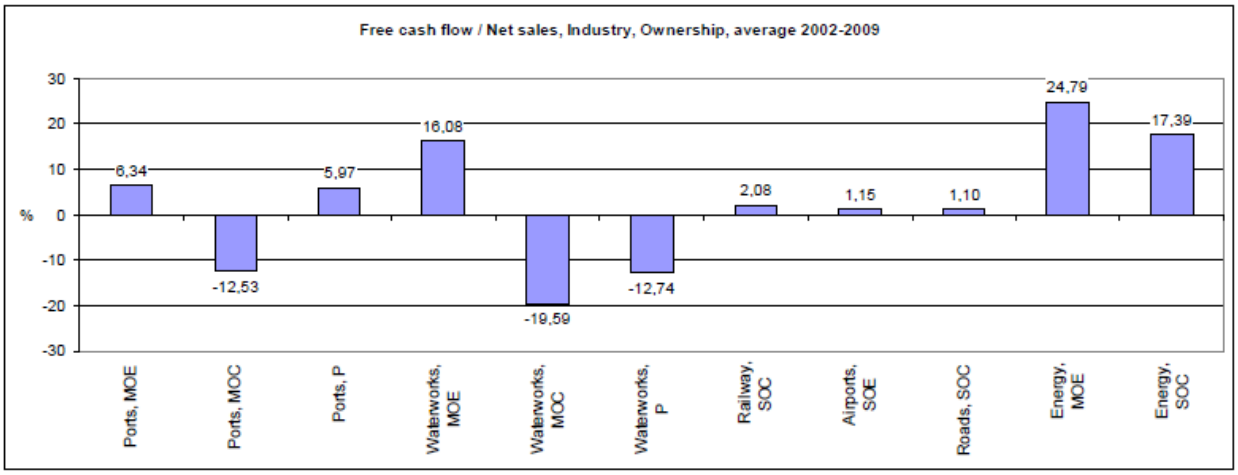

Figure 7 - Free cash flow / net sales per ownership model and industry, average for 2002-2009

Looking at ports and energy utilities, the MOE model seems to enable the best cash-based returns to the owners. We believe the difference is partly coming from tax treatment, but explains well why private investors have been particularly interested in energy grids and utilities, as well as ports. Ports also have in general offered the best examples for PPPs within transport sector.

The returns on assets and investments are presented in Figures 8 and 9. The pattern remains the same as observed above, with energy and ports being the strong industries, whereas the others have more moderate returns. The ROI calculus was made in comparison with minimum required returns. The minimum returns were defined as the total interests paid for interest-bearing liabilities.

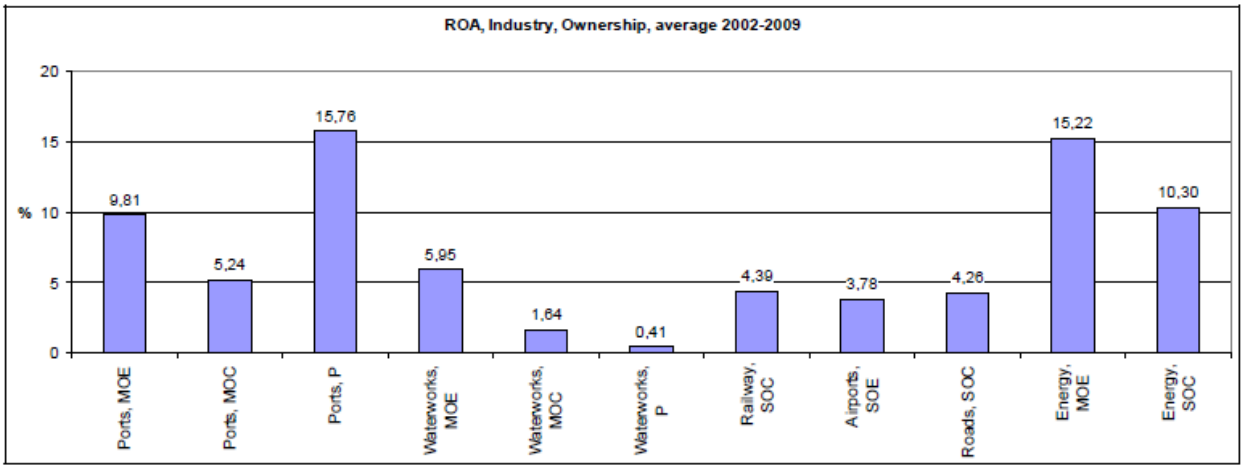

Figure 8 – Return on assets (ROA) per ownership model and industry, average for 2002-2009

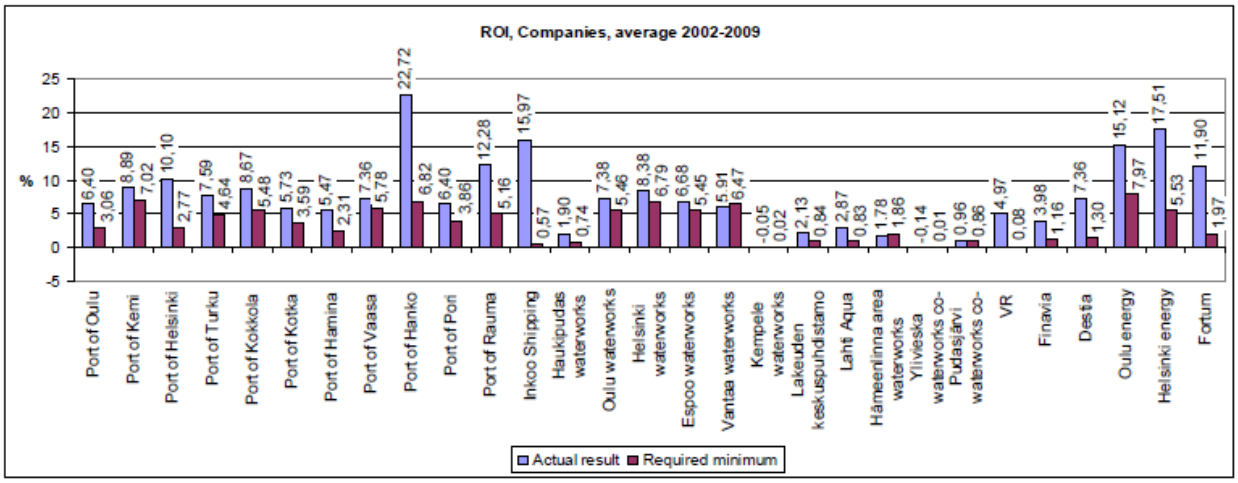

Figure 9 – Return on investment (ROI) per entity; actual and minimum required returns

Finally, the municipalities' returns on MOEs is an interesting special case. What Figure 10 clearly states is that the minimum required returns are pretty much systematically exceeded. The question may be raised why any municipality or city would like to reorganise, outsource or privatise these entities and give up from the returns and positive cash flows they apparently are generating.

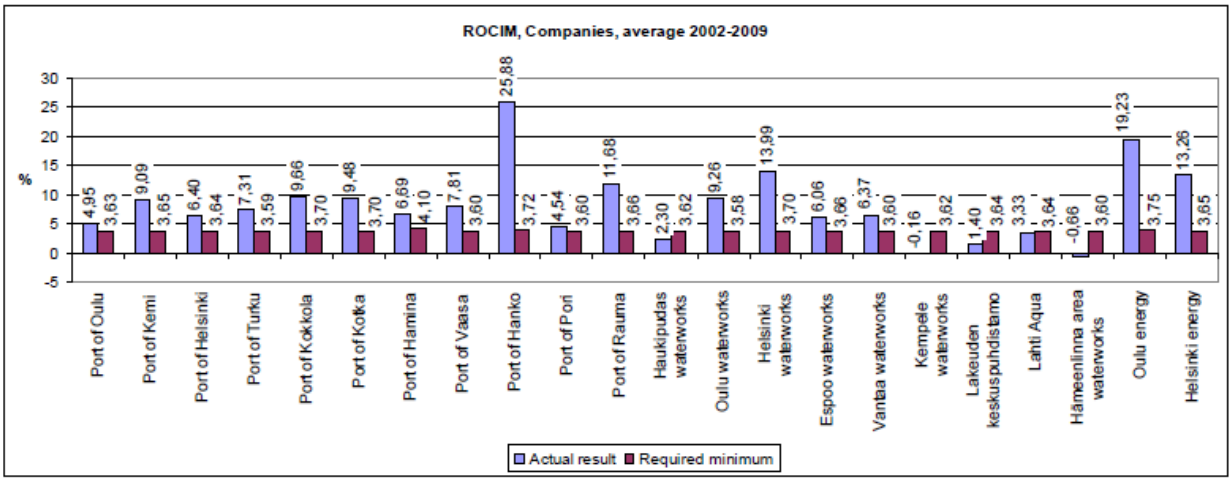

Figure 10 – Returns to the municipal owners (ROCIM) per entity; actual and minimum required returns

DISCUSSION AND EVALUATION

Ownership model and cash generating capacity

It appears that the ownership model in itself is not a guarantee for financial performance, for the better or for the worse. However, due to the fact that some ownership models require publication of less financial information, some of the analyses have been difficult to carry out. Most financial analysis tools have been designed for listed companies to enable comparisons with one another in a comprehensive manner. The financing arrangements between a public entity (state or municipality) and a company that it owns appear to have more complex repercussions to analysis than one would assume from the outset.

A provisional conclusion of the financial analysis is that the energy sector is the best performing industry, followed by ports and waterworks, again keeping in mind that the results are far from a unified picture of a given industry. It appears that the ownership has a lesser role in determining the financial position of a company than what would have been the initial assumption, provided the financial accounts that the research team had available are accurate, and there are no hidden costs or subsidies. Ownership does not appear to hinder performance from the financial point of view. Ownership restructuring seems to focus on reducing the size of public labour force, on effective competition, and only indirectly, especially for the waterworks, on efficiency gains and financial performance.

What seems evident, however, is the good cash generating capabilities of those sectors that traditionally have been more market exposed. Ports, for example, have traditionally been the trading places for goods (probably the first real "marketplaces" in history have been around ports) and cargo and transport operators have always met there. In other words, ports have a long history of good business and trading. When the World Bank published its Module 3 Port Reform Tool Kit already in 1990's (World Bank, 2012), the port ownership and governance models were categorised according to types of ports and their technical characteristics, not so much on the basis of owners, which has been our focus. Also the empirical foundation on financial performance was not on World Bank's agenda. The Finnish ports' financial analysis per ownership model contributes to this issue by emphasising the fact that ports are providing good returns to their owners and hence the ownership discussion should take this fact into account.

Areas which have been regarded as public domain for a long time – roads, streets, for example – have a clearly a weaker cash generating capacity in the light of business units operating in the sector. This does not mean, however, that revenues cannot be collected for road usage – quite contrary. For example in Finland the State collected charges worth 6.1 billion € from the public roads (not including private and municipal roads and streets) in 2009, which covered well the infrastructure and social costs of public roads traffic (Leviäkangas & Hautala, 2011). The State uses these revenues for re-distribution as any other tax revenues without earmarking. But this does not change the fact that substantial revenues are raised.

The abovementioned being the case, it seems that most infrastructure networks can be used as an efficient revenue generating machine, provided that the ownership and governance models allow it. Furthermore, in most cases the returns to the owners exceed that which is can be considered as required minimum.

Room for PPPs

The results imply that unbundling infrastructures from operations do not necessarily facilitate higher cash flows. The integrated models, where the utility and distribution infrastructure are under same ownership, are performing financially at least as well as the unbundled models. The Finnish study on infrastructure O&G models raised media attention with mixed

reactions[1]. On one side, the liberalistic media (mainly business community magazines and newspapers) emphasised the obvious cross-subsidy provided by MOEs and SOEs through their owners, whereas on the other side the political left-wing media underlined the importance of public ownership in generating revenues. Both sides were of course right, but conveying only the other side of the story.

According to the Association of Finnish Civil Engineers' (2012) statement on State of the Built Environment in 2011, the municipal and transport networks accounted together about 7% of the national asset base which totals to 770 billion €. 4% was accounted for transport infrastructures and 3% for municipal infrastructures (streets, water, waste water, drainage). For each infrastructures the investment backlog is estimated to be 2.5 billion €, which exceeds the investments made in them. In essence this means that infrastructures are deteriorating, especially the transport infrastructures. While both the State and municipalities and cities are struggling with their budgets to cover rising social, healthcare and education costs, there is little room for infrastructure investments. Hence PPPs are seen as one solution alternative.

In order to meet budget constraints, PPP investments that are amortised via public budgets will not bring relief to the State and local governments. The only sustainable way to recover the invested capital of private investors will be user charges. These have already been adopted for electricity consumption and Finnish consumers have for years received electricity bills with two components: the electricity based on consumption (€/kWh) and the transfer fee (fixed, covering the infrastructure costs). The same should perhaps be applied to transport as well, meaning road user charging. This seems also the only way to make the long-term financing equation work.

Conventionally, PPPs in transport sector have been considered to be a project procurement method, where pieces of infrastructures are carried out by private consortia. This might work as project procurement method, no doubt, but as a sustainable network solution this has multiple problems. For example, if the invested capital recovery is based on shadow tolls or availability payments, the public body will have to budget these payments over the concession periods. Quantitative financial analyses have shown that this type of arrangement is perhaps not the most economical for the public sector (Leviäkangas, 2007; Leviäkangas et al. 2012).

The sustainable alternative could be as done for the national electricity grid, where both the State and private investors together jointly own the infrastructure (http://www.fingrid.fi/en/Pages/default.aspx). Fingrid's shares are not traded and cannot be exchanged without other shareholders' acceptance. The sustainable alternative is simple, leading to a true public-private-partnership: networks should corporatized so that their ownership could be split between public and private investors. Corporation charters and shareholder agreements could be employed in order to ensure that public benefits are

[1] see http://www.vtt.fi/news/2011/20112510_energia_ja_satamat_tuottavat_infrastruktuurista_parhaiten.jsp?lang=en for media release.

reasonably taken into account in decision making, management and governance. Private investors could also be kept as minority shareholders. When new owners step in, they should naturally pay a reasonable price for their share. The newcomers' investment in the infrastructure ownership could be further utilised for relieving the investment and maintenance backlog. In practice, the sliced ownership would mean that infrastructure is owned through shareholding, as for this the institutional framework (legislation, good practices, etc.) is already in place. This is of course not necessarily the situation in other countries, but surely in northern Europe at least.

Examples of whole networks' corporatisation exist. ASFINAG (Autobahnen- und Schnellstraßen-Finanzierungs-AG) is the state-owned corporation in Austria that manages the whole motorway network. It is able to generate positive cash flow after maintenance and new investments by solely relying on toll and vignette revenues. The Greek motorway network has been in practice concessioned to public and private toll road companies. In Norway, most of the main roads are tolled by public toll companies. In principle these ownerships are possible to split between public and private and agree on socially and environmentally sustainable but yet reasonably profitable pricing. The future will surely point us to this direction, as visualised in Figure 11.

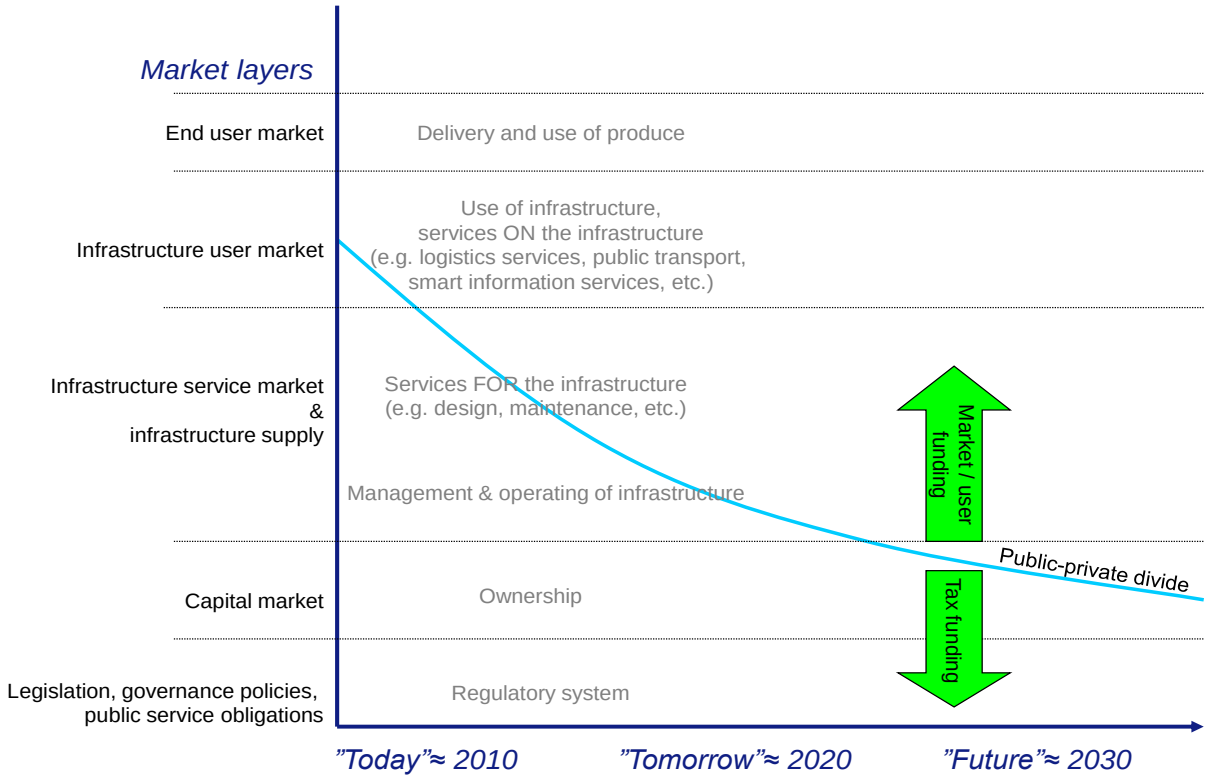

Figure 11 – The presence and future of infrastructure ownership and finance (source: authors)

CONCLUSION

We need our infrastructures but we also need sustainable financing of them. When public funds are abundant, we can afford to expand and maintain infrastructures as public assets.

But since they are not free of costs, the sustainable solution is to make them more transparently user financed, and organise their ownership and governance as true public-private-partnerships. Procuring infrastructure in bits and pieces is not true PPP, just a procurement technique. Involving private sector as network owners will not only be good business, but also sharing the responsibility of communities' well-being.

Infrastructure assets are in themselves almost risk-free in terms of demand risk, provided that there is an adequate population and economic base. In our analysis of Finnish infrastructures, the cash flows from infrastructures to their owners were considered non-correlative to market returns (Leviäkangas et al., 2011). In other words, investors could with equal confidence invest in government bonds as in infrastructure assets, provided that there are the pay-back mechanisms in place. Users must be charged for the use of streets, roads, ports, airports, and rails, as they are already paying for water and electricity, which are even higher in Maslow's hierarchy than mobility of goods and people.

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APPENDIX: FINANCIAL STATEMENTS AND RATIOS

The analyses in this work follow the basic methodology used for analysing listed companies in Finland. This section of the report presents the basic formulae used.

Adjusted income statement:

Net sales (turnover)
+ Other operating income
= TOTAL OPERATING INCOME
- Materials and supplies used
- Outsourced services
- Personnel expenses
- Adjustment to entrepreneur's salary
- Other operating expenses
+/- Increase/Decrease in finished goods and work-in-progress inventories
= OPERATING MARGIN (EBITDA)
- Depreciation according to plan
- Reductions in value of fixed and other non-current assets
- Exceptional reductions in value of current assets
= OPERATING PROFIT (LOSS) (EBIT)
+ Income on shares/similar rights of ownership and other investments
+ Other interest and financial income
- Interest and other financial expenses
+/- Foreign exchange gains/losses
- Reductions in value of investments in fixed and other non-current and current assets
- Direct taxes
= NET PROFIT (LOSS)
+ Extraordinary income
- Extraordinary expenses
= TOTAL PROFIT (LOSS)
-/+ Increase/Decrease in depreciation difference
-/+ Increase/Decrease in voluntary provisions
+ Adjustment to entrepreneur's salary
+/- Changes in market value
+/- Other adjustments to profit
= PROFIT (LOSS) FOR THE FISCAL PERIOD

Free cash flow statement:

Operating profit (loss)
+ Shares/Similar rights of ownership in associated companies
- Operating taxes
- Tax effect of financial expenses
+ Tax effect of financial income
= Operating cash flow
+ Depreciation
= Gross cash flow
- Change in working capital
- Gross investments
= Free operating cash flow
+/- Other expenses (after taxes)
= Free cash flow

Return on assets, ROA:

ROA measures how profitable a company is relative to its total assets. The ROA figure gives investors an idea of how effectively the company is converting the money it has invested in assets into net income. The higher the ROA number, the better, because the company is earning more money on less investment.

$$\text{ROA} = \frac{\text{Net result} + \text{Financial expenses} + \text{Taxes (12 mths)}}{\text{Average adjusted balance sheet total}} \times 100$$

where

Financial expenses = interest and other financial expenses + foreign exchange losses.

ROA is a profitability measure which is not affected by either the tax policy or the tax characteristics of the corporate form of the business. ROA is more useful than ROI in cases where it is impossible to clarify the division between the interest-bearing and the non-interest-bearing external capital. According to the Committee for Corporate Analysis (2006), ROA can be given the following benchmark values:

above 10% = good,
5–10% = satisfactory,
below 5% = poor.

Return on investment, ROI:
Return on Investment (ROI) measures how profitable a company is relative to its invested capital. ROI measures a company's profitability and its management's ability to generate profits from the funds investors have placed at its disposal.

$$\text{ROI} = \frac{\text{Net result} + \text{Financial expenses} + \text{Taxes (12 mths)}}{\text{Average invested capital of the fiscal period}} \times 100$$

where

Average invested capital =
Adjusted shareholders' equity
+ Long-term liabilities
+ Short-term interest-bearing liabilities
+ Other short-term interest-bearing liabilities to corporate group companies.

Comparing this ratio of different companies may be difficult if information from which to separate the interest-bearing liabilities (i.e. capital requiring return) from the noninterest-bearing liabilities is lacking. ROI can be regarded as fairly good when it amounts to the average financial expense percentage of the interest-bearing liabilities.

$$\text{Required minimum} = \frac{\text{Financial expenses}}{\text{Average invested capital of the fiscal period}} \times 100$$

Return on capital invested by municipality, ROCIM:
Return on capital invested by municipality (municipalities) (ROCIM) measures the amount of profit a company generates with the money that the municipality (municipalities) have invested (note: there can be multiple municipalities as shareholders).

$$\text{ROCIM} = \frac{\text{To the municipality}}{\text{From the municipality}} \times 100$$

where

To the municipality
= Profit (loss) before closing entries and taxes
+ Compensation from share capital invested by the municipality
+ Interest paid to municipality,

and

From the municipality
= Support and aid from municipality
+ Shareholders' equity
+ Loans from municipality
+ Depreciation difference and voluntary provisions (for instance for future investments).