

ВОПРОСЫ ТЕОРИИ**How to Escape the Trap of Resource-Based Development:
Contrasting Experiences**

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Most recent discussion on resource-based development has been in terms of a burden of resource abundance (Auty, 2001). Though the measurement of resource abundance is not self-evident at all, there is indeed much empirical evidence that resource-rich countries tend to perform badly both in terms of welfare levels and economic growth. Externally, resource abundance tends to contribute to high inequality. The society at large therefore tends to equate trade with the interests of the rich. There is therefore much ground for populism and – more recently – to anti-globalism as a variant thereof. There is also a tendency towards the Dutch Disease, where large revenue and perhaps investment flows lead to a real exchange rate which is detrimentally high for the competitiveness of the non-resource based part of the economy. A skewed production and export structure tends to associate with volatile export prices, contributing to economic and policy instability.

Internally, a resource-rich country tends to concentrate on rent seeking instead of wealth creation. Easily available rents also lead to excessive import substitution and to the neglect of human resource development. In short, resource abundance often associates with a neglect of investment in productive, human and social capital. Therefore, low development levels and slow growth should come as no surprise.

There are exceptions to these rules. Norway is perhaps the most obvious one. In its case, however, resource abundance was found only after a more versatile production structure together with well-developed institutions and policy traditions had already been long established. Discussing this particular positive exception might therefore not be particularly relevant for a Russian audience.

This paper therefore asks a somewhat different question, one that goes into the heart of traditional economic discourse. Countries, even the most successful ones, have progressed from resource-based development to investment-based growth and further into innovation-driven – or universities-driven! – development. Though resource abundance might therefore be a curse, resource-based development is clearly not. The question, therefore, is how do countries progress through these phases in the modern world.

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This paper does not aim at a general theory, but instead takes on the more modest task of telling a modern historical tale, a parable that just might have at least some relevance for Russia. This is a tale about Finland, a country that has in the short period of four decades emerged from forest-based development to a situation where electronics, engineering and forestry industries are the basically equally important branches of production and exports (Table 1). Table 1 puts this story of diversification in a nutshell. The rest of the paper tells the tale through a number of myths.

Table 1.**Finland's export structure in 1960–2000, per cent, stylised**

	1960	1980	2000
Electronics	1	3	30
Metals based	14	25	24
Wood based	69	45	29
Others	16	26	17

Even if Finland's development is no longer resource-based, forestry industries (basically paper) remain important. In fact, the export value of Finland's forestry in 2000 was at about ten billion dollars more than twice the value of Russia's total military exports. Obviously, escaping the possible traps of resource-based development does not mean abandoning the existing resource base. It means getting more out of what one has, and then also developing something else to do.

In some senses Table 1 exaggerates change. As discussed below, much engineering production is actually forestry related. Further, net export shares differ from the gross ones just given. On the average, Finnish industry currently imports about a quarter of the value of its output. In forest industries, the import share is however just fifteen per cent, while it is very much higher in electronics.

Finland's forest resources are just one half percentage point of the global total. (Russia's are almost 40 times bigger.) It would probably be highly misleading therefore to characterise Finland as a resource abundant country, but as recently as in 1960 more than two thirds of its exports were directly wood-based.

The first thing to note about Finnish forests is that due to geographical, geological and climate reasons they grow slowly. The average annual natural growth – with large regional variation – is just around four per cent. Owning forests is therefore not an obviously competitive investment. But one in six Finnish households do own some forest. Finnish forests have been predominantly family-owned ever since 1757, when the privatisation of earlier communally exploited forests was started. This General Reparceling – as it is called – took about a hundred years to implement in the main. Now, households own 72 per cent of the annual increment in forest stock. The rest is divided between the state (13 per cent), forest-industry companies (10 per cent) and others.

The General Reparceling has meant that the revenue accruing to forest owners has been widely distributed in the society. Practically all peasant farmers have depended on forests on additional work (especially in the winter) and revenue, without which quite few farms had been sustainable. This has contributed to fulfilling one of the absolute requirements of feasible forest industries, the reliable supplies of raw material. Whether this will change now that due to urbanisation an increasing share of forest owners are townspeople with less relative need for revenue from wood sales and more appreciation to the non-pecuniary rewards of forests, is a key question.

But the private property rights of forest owners have been severely restricted since the seventeenth century, due to the perceived very large externalities of forest resources. The natural growth rate of forests is, as mentioned, not high enough to satisfy the private return expectations of rational investors: higher yields are available elsewhere. Either forest owners must value the non-pecuniary services available from forests in a way which is consistent with economically rational forest maintenance practices, or the authorities must intervene to make sure that rational practices are followed. Though harvesting has never – with partial exceptions of war times – been obligatory, spoiling of forests has been a crime for a long time. The 1886 forest legislation forbade the destruction of forests, largely to prevent the slash and burn farm-land claiming practice common so far in many regions. It also mandated obligatory replanting in case of logging. The 1997 legislation takes a wider interpretation of what is rational and calls for forestry being based on ecological and economic sustainability, something that is open to diverging interpretations. This has contributed to ecologically-minded NGO's becoming, in addition to forest owners, the state and forestry companies, important participants in forestry debates. The maintenance of old-growth forests, in particular, has become an international civil-society issue and repeatedly leads into minor «forest wars». A maximum penalty of two years in prison is applicable if the requirements of the legislation are not followed. Economic incentives, counselling and education are however more important.

Myth number one: resource-base is a given

Forest is a typical renewable resource, but its size is far from being a given (Table 2)². Finland's forest stock declined in the 1940's, primarily because of area – twelve per cent of forest area and fifteen per cent of forest industry – lost in the Second World War. This loss was recovered by 1980, and in 2000 the stock was almost twenty per cent bigger than it had been just two decades before. The growth has been 41 per cent since 1960. This is largely due to forestation of wetlands since the 1960's and of redundant farm-land since the 1980's. Replanting, rational forest maintenance and harvesting as well as possibly climate change have also contributed.

Table 2.

**Finland's forest stock, millions of cubic meters,
1920–2000**

1920	1945	1980	2000
1600	1375	1600	2000

In terms of the annual increment to the forest stock, the increase is also impressive. In 1960, the increment was 55 million cubic metres. At the turn of the century the figure was 76 million cubic metres. The increase in increment is thus more than a third. This should not be seen as implying that all investment into increasing the forest stock has necessarily been rational. It is quite obvious, for instance, that much forestation of wetlands has not been even economically productive, not to mention the other values of aesthetics, multiple-use and ecological diversity involved.

²) Basic information on the Finnish forest sector is available at www.metsateollisuus.fi and www.metla.fi.

Recently, annual logging has been around 70 million cubic meters. There is thus only little room for increased logging. It is also expected that – barring major climate change – annual increment will grow only slowly in the future, as most obvious rationalisation of forest management has already been done. The Finnish forestry industry thus probably now faces a basically stagnant resource base.

This is not the case in Russia. Russia's forest area, as mentioned, is almost 40 times larger than in Finland. Annual increment, on the other hand, is ten times bigger, reflecting both climatic and forest technological differences. Annual logging, further, is just 160 million cubic meters, or just a fraction of annual increment.

The second path of increasing the resource base has been recycling. One third of the raw material input of global forest industry is currently recycled material. Due to that, totally new resource sources have opened up, primarily in such densely populated high-income and high paper-use regions as Central Europe. Transport costs prevent large-scale imports of this raw material to Finland. Factories have to be established close to resource sources. Though Finland recycles some two thirds of all paper used, the relative abundance of this raw material elsewhere and shorter transport distances have been a major reason for the international expansion of Finnish forestry companies to Central Europe in particular. New fibre is however always needed for producing paper. Because of quality deterioration, paper can only be recycled 3-4 times.

Thus, the first lesson to be learned from the Finnish experience is: *develop your resource base even if that means restricting private property rights.*

Myth number two: there is little value-added available

The basic paper production technology is some 2000 years old. Globally, and in Finland as well, forest industry has the reputation of being rather conservative. Only one half percentage point of turnover of Finnish forestry companies is used for research and development, and even that very low figure is higher than that of the main foreign competitors. In addition, there is more research in other, related industries. In any case, forest industries are not seen as very attractive, they are seen as traditional heavy industry with little possibilities of large value-added. The investment cost of a large paper mill easily reaches one billion euros.

It is true that these are resource and energy-intensive industries. But still, efficiency of resource use has improved hugely, in particular during the last two decades. Between 1980 and 2000 the output of Finnish forest plants doubled in cubic metres while wood use stagnated. The doubling of the efficiency of round wood use was largely due to the utilisation of side products like chip and saw-dust. Globally, progress has been less, but it exists. The proportion of round-wood used to output (in cubic metres), declined from 1945 to 1990 from 3.1 to 2.4.

Less improvement has taken place in energy efficiency, though the heat generated by the production process itself is now much better utilised (Energy visions, 2001, Ch. 6). In a country like Finland, pollution by forest industry emissions used to be the major environmental concern as late as in the early 1980's. It no longer is, as emission levels have declined very radically, on the average by some ten per cent annually. The emission of chlorides, for instance, in practice no longer exists. In state-of-the-art paper mills, water consumption has declined by 85-90 per cent in twenty years. Completely closed production systems are already technically feasible.

Finally, there is much value-added available in upgrading outputs. Table 3 gives the approximate prices of various forest industry products. The Finnish industry has graduated from producing mainly sawn wood and later pulp to producing one fourth of global newsprint. Higher variants of paper are increasingly introduced, and though Rapala and other fishing lures, made primarily of wood and metals, may still be niche products, they point out one possible path forward. Perhaps a more important one will be combining forestry and chemistry to produce new kinds of output. Combinations of paper and electronics («intelligent paper») are also developed.

Table 3.

**Approximate prices of forest industry products,
euro per kilogram**

Logs	Sawn wood	Pulp	Plywood	Printing paper	Furniture	Fishing lure
0.1	0.4	0.5	1.3	2.0	8.0	500.0

Thus, the second lesson will be: *wood-based products may be high-tech, though most are not.*

Myth number three: resource-based is local

Forests are – in spite of Shakespeare’s opinion – obviously immobile. But that does not mean that forest industries should be local. In fact, there is no «Finnish» forest industry. Ten to fifteen per cent – in 2001 as much as 20 per cent – of all round-wood used in Finnish plants is imported, overwhelmingly but not only from Russia. Most pigment used particularly in producing high-quality paper is imported. Paper for, say, art books contains as much «stone and clay» as wood.

What is of greater importance, about sixty per cent of the production of Finnish paper companies is currently located abroad. Ninety per cent of Finnish-located production is exported, and it is even an open question to which degree the Finnish forestry majors are really Finnish. There are five major companies, three of them among the biggest in the world. Their ownership is mostly foreign, but the location of corporate headquarters and in some sense identity basically remains Finnish.

The third lesson, then: *local can be global.*

Myth number four: there are few spin-offs

Few things could be more thoroughly wrong than the sometimes held view that forest industry would be in some sense an island upon itself with few spin-offs in the rest of the economy. In fact, the rise of the Finnish engineering industry between 1960–1980 visible in Table 1 above was to a large degree forest industry related. Today, Finland produces a third of the world’s paper mill machinery, and the market share in forest harvesting machinery is as high. Even shipbuilding has been to a degree forestry-related, not only due to building ships to transport products, but also because of the equipment traditionally used in floating, the water transport of round-wood. Also the tertiary sector of services boasts important forestry spin-offs in businesses like consulting, project development and research. The forestry cluster thus reaches across the whole economy.

Thus, lesson four: *there are more linkages than meet the eye.*

Myth number five: it can and should be planned, by companies at least

This myth does not concern as much the development of forestry industry as it concerns the emergence of other businesses. To see the lack of truth in the myth, let us have a look at the adventures of a well-known Finnish company.

The company was founded in 1967, as three largely jointly-owned older companies were fused. Almost half (47 per cent) of the modest turnover of 0.6 billion euros (all data here and below are in 2000 prices) was in cables. The rest was divided between such rubber products as car tyres and boots (27 per cent) and forest industry, mainly soft tissues (19 per cent).

By 1983 the company had gone through a phase of diversification and grown to a turnover of 2.5 billion euros. Cables still accounted for 28 per cent, forestry for 24 per cent and rubber products for 24 per cent. But electronics had become important as well with 19 per cent of corporate turnover. The company was producing, among others, telephone switch systems. By the mid-1980's it had also become a global top-five producer in what at the time remained the very small market of mobile phones.

A few years later the company had committed itself to two huge mistakes, which by 1992 almost took it to bankruptcy. As the fashion of the time was, the company had modelled itself after the Japanese conglomerates. With a turnover on 4.0 billion euros in 1988, the company counted up to 180 «strategic business areas». They reached anything from rifles to lamp bulbs to printing. Cables (13 per cent of turnover) had not been abandoned, telecoms were just 10 per cent, consumer electronics were 31 per cent. All the rest accounted for 46 per cent. Excessive diversification was a major mistake. Consumer electronics, in particular the TV factories bought in Germany, almost bankrupted the company.

By 2000 the company had benefited hugely from the mobile communications revolution. With a turnover of 30.4 billion euros, it had become one of the most valuable companies of the world. Producing basically just mobile phones (72 per cent) and other telecoms (25 per cent), it had also taken a path very distinct from the fashion of the 1980's. Instead of «not putting all eggs in one basket» it had «concentrated on core competence», surely also a risky strategy given the vagaries of high technology markets. But this company – the name is Nokia – succeeded where some others which were also in global mobile phones top-five in the mid-1980's failed, at least in a relative sense. Looking backwards, it is obvious that no industrial policy planner could have foreseen that exactly mobile communications markets were to explode. But neither does the Nokia story seem to tell of far-sighted company wisdom (see the official history of the company, Häikiö, 2001).

Therefore, lesson five: *success cannot be planned.*

Myth number six: there must be a hidden industrial policy hand involved

Still, many people have problems in comprehending that there really is no hidden industrial policy hand behind the Finnish transformation. Rather, the fact is that the government tried to crowd out private industry from Finnish electronics in the 1980's, planning for a major state-owned corporation that would take the prime responsibility. A state-owned TV tube factory was even opened – with technologies

from Toshiba – but it failed almost immediately. With it died any remaining wishes of the state to engage actively in technology industries.

Naturally, the state did have its role. In Finland nation building in the 19th century also meant the building of state institutions autonomous from the Russian empire. The Finnish lands were annexed by Russia in 1809. Allowing, even encouraging the building of specifically Finnish institutions was in Russian eyes a counterweight to earlier Swedish traditions and influence. In Finnish eyes, it increasingly became a defence against Russia. Therefore, the state was seen as one's own, and also as being benevolent. Almost all Finns became to trust and rely upon the state, and the country became and has remained illiberal in the sense of having a large public sector. The share of state-owned companies in industrial production was – depending on measure – up to a fifth still in the 1960's. Usually these companies were however subject to competition, and most citizens and employees would have been unable to say – for instance – which of the forestry companies of the time was state-owned. Finland has never engaged in nationalisation, but neither has privatisation been seen as an ideological issue.

Rather than in production, the state was crucial in providing (a) stable institutional frameworks, in (b) building a welfare state also as a safety web providing an insurance against the risks of entrepreneurship, and in (c) providing education. Trilateral (d) co-operation between public universities, private companies and state-owned research institutes was and remains crucial for technological development. The share of R&D in GDP rose from 1.2 to 3.6. per cent from 1982 to 2001. The recent figure is perhaps the highest in the world. Not only is it more than twice the same figure in Russia (Malkin, 2001). In Russia the figure is stagnant, two thirds are state-finance and much is still used for military purposes with relatively little civilian spin-offs. In Finland, like in some other high-tech countries, two thirds are enterprise-financed and there is very little military R&D. At peak, just one tenth of Nokia research was state financed.

The state was also crucial in contributing to the (e) availability of cheap energy so crucial for forestry industries. Until the early 1980's, it used (f) devaluations to maintain the profitability of export industries, whose competitiveness was continually threatened by wage pressure. Even relatively small (g) state orders of equipment sometimes had a crucial role. This is also true in Finnish electronics. But perhaps the least understood role of the state was in (h) providing standards. The NMT standard in mobile phones was in 1982 agreed upon by the Nordic states. It provided for a critical market size and also for the first time solved technical problems like roaming or the «the one pays who makes the call» principle. Even in the 1987 GSM-1 standards states had an active role, but no longer in the later ones, which are directly agreed upon by the companies. And the first GSM net was on 1 July 1991 opened by private Finnish operators.

But finally one should note that Finland engaged in early (i) deregulation of the mobile communications sector. The Finnish telephone system always had two sets of operators. There was a state agency with a monopoly in long-distance and foreign calls. Private companies had regional monopolies in local calls. In this sense, there was no competition. But there was no monopsony, and equipment was always bought through competitive orders. Contrary to certain large European countries, producers like Nokia always faced import competition (Table 4). Therefore it was much better placed to face deregulation than were, for example, Alcatel or Siemens. In a country like Denmark, on the other hand, no major company existed to seize the possibility.

Table 4.

The share of imports in electronics, 1980, per cent

France	Germany	Finland	Denmark
3	4	42	66

Finland created competition in telecommunication operations since 1987, starting with telefaxes. Everything else followed just soon enough perhaps to have provided Nokia with a small lead. As noted before, the company was a major in a very small market already in the mid-1980's. The fact that this market soon exploded was driven by innovation. But that this Finnish company was best placed to utilise the explosion, has much to do with the relatively early Finnish deregulation. But as we have also seen, there was much else in the background as well.

Inevitably, lesson six follows: *the most important secret is that there is no secret, just a combination of factors, circumstances – and pure luck.*

Myth number seven: it is a matter of exchange rate policy

Finland used, from the 1940's until the early 1980's, a policy of repeated devaluations to correct for the lack of foreign trade profitability due to wage pressure from highly unionised labour markets. This contributed to fluctuations in income distribution, but also to a high investment share and economic growth that was generally higher than in comparative countries. Does it then follow that Finnish transformation was predicated upon exchange rate policies, possibly undervaluation, and should other countries follow this example?

Before jumping into conclusions, a few additional comments are in order. First, repeated devaluations also contributed into a devaluation-inflation – cycle, where income distribution – that is the real exchange rate – fluctuated quite wildly. It is not possible to choose the real exchange rate over the long run, and short-term fluctuations create such unnecessary noise in information and incentives that is probably detrimental to rational decision-making.

Second, there is important evidence that the plentiful Finnish investments were arguably often inefficient (Pohjola, 1996). In 1960-1990 Finland's investment share was the highest among countries for which comparable data is available, while consumption levels remained modest in spite of relatively fast growth. Forestry companies have been the biggest investors, and the efficiency of their investment has also been debated.

Third, much of the modernisation of forestry industries and emergence of the electronics industry took place after the devaluation based policy regime had been abandoned since the early 1980's. Trade unions have also been willing and able to adopt themselves to the low-inflation environment. Still, it may well be that the relative weakness of the euro in 1999-2001 benefited the Finnish economy in a major way. Two thirds of Finland's exports, after all, go outside the eurozone.

Overall, the least that should be said as conclusion seven is: *beware of any single causation explanations.*

Can the Finnish model hold?

In recent competitiveness reports, Finland has repeatedly come up as number one or at least in top-three. Such rankings should always be taken with a proper amount of salt. They are based on limited number of indicators or on fallible expert opinion (Rouvinen, 2001). But still, sensible people may take them seriously and they may therefore have an impact on economic behaviour.

One noteworthy feature of these reports is that the top-ten always includes both a number of high-taxation, large welfare-state North-Western European countries as well as such low-taxation, small welfare-state countries as the USA and Singapore. This perhaps means that different countries may succeed in their own, widely diverging ways. If so, policy-makers and analysts should probably be relieved: in the end there perhaps is no single size that fits us all.

Naturally, even recent good performance is not necessarily a sufficient forecast for the future. Increased reliance on a volatile high-technology branch like mobile communications is a risk, in particular given that a full one quarter of Finland's exports (Table 1) is due to a single company. But still, the fundamentals of education, research, economic policy making and the rules of the game are sound. Even on the index of economic freedom Finland is as high up as number fourteen, something one would really not expect from a high-taxation, large welfare-state country. There is too much hype about the Finnish model around (Castells – Himanen, 2001) but still the future is not necessarily all bleak.

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