Double or Nothing
Metals: Status and future development

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PROSIN
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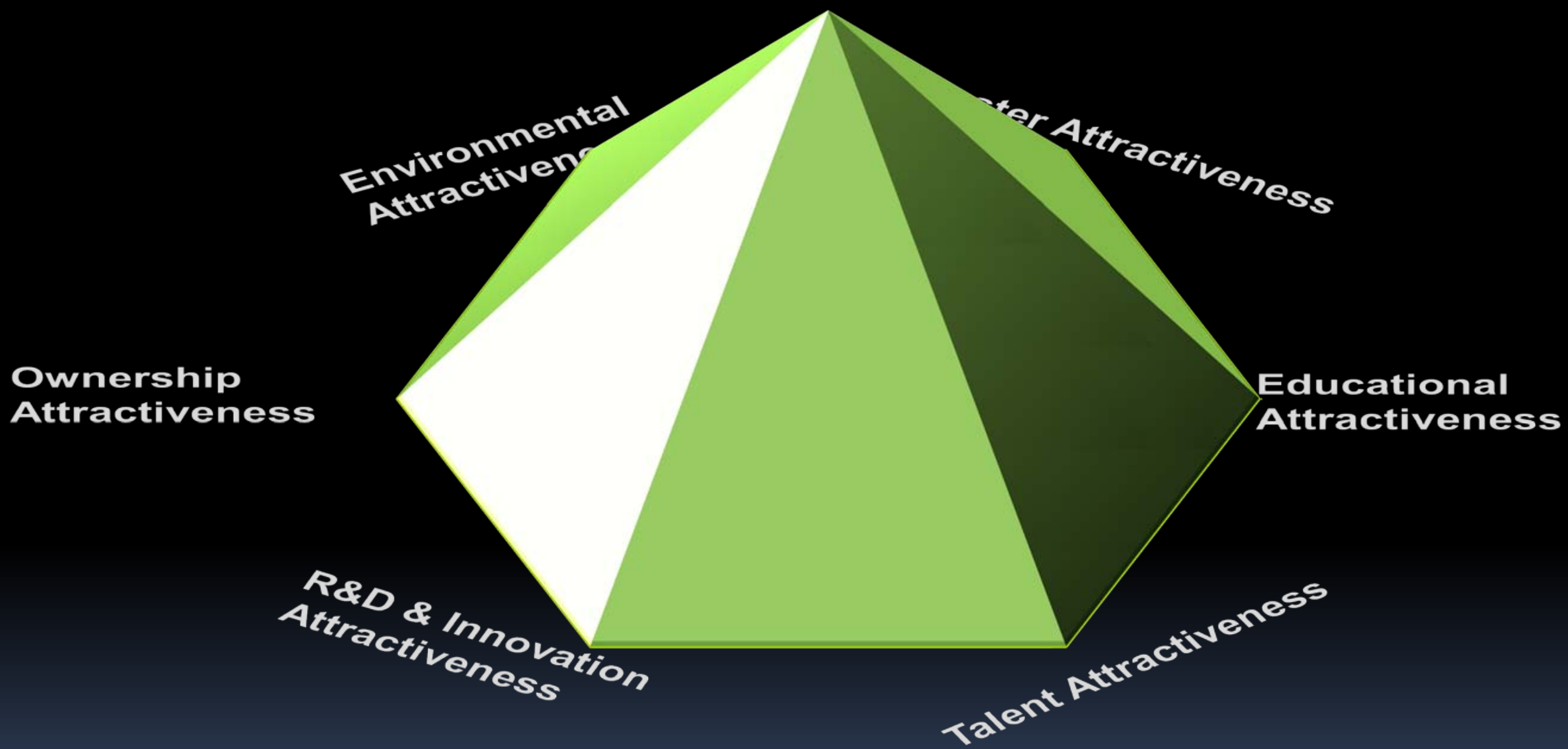
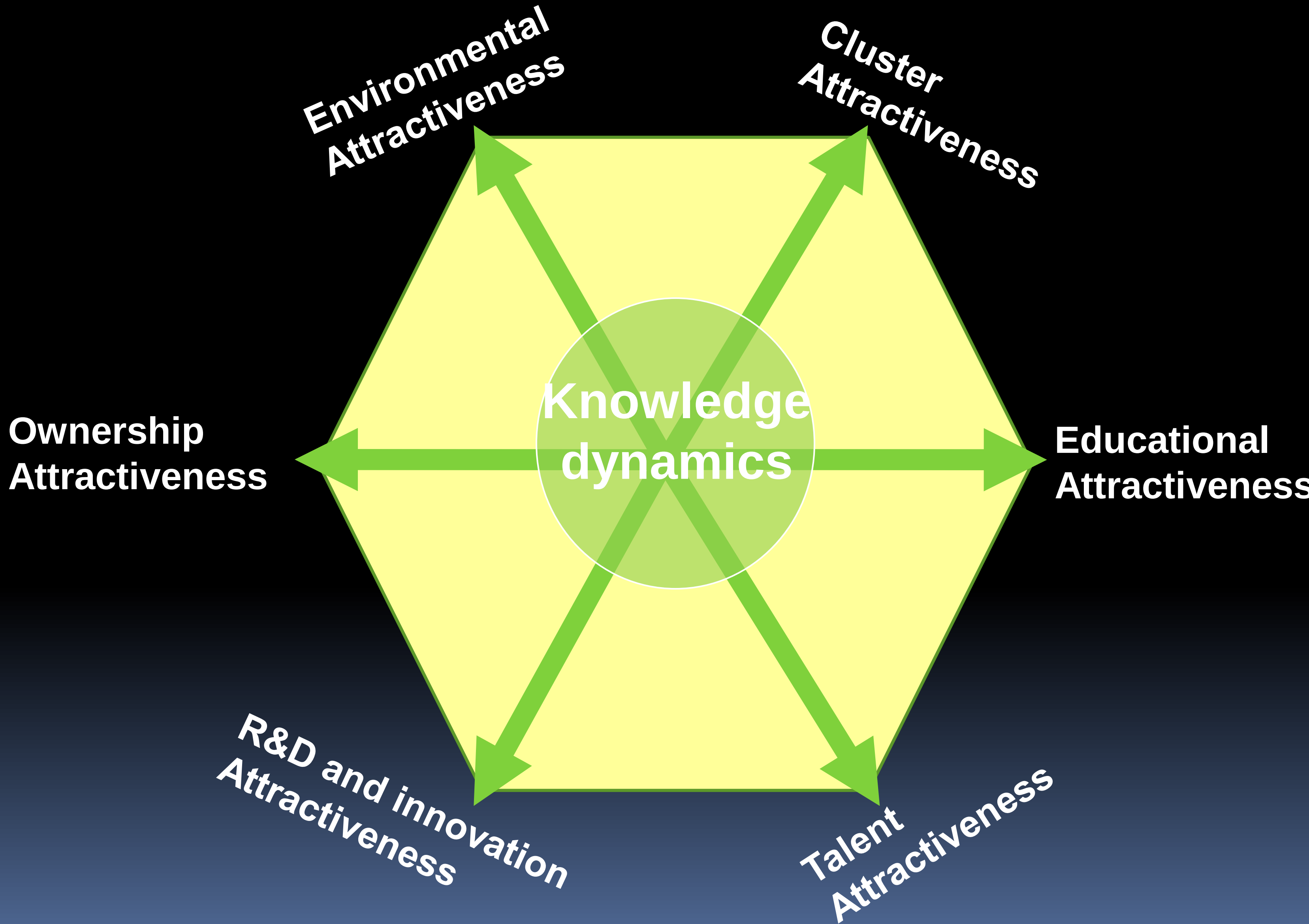
The Emerald Model



The Emerald Model



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KNOWLEDGE-BASED METALS & MATERIALS

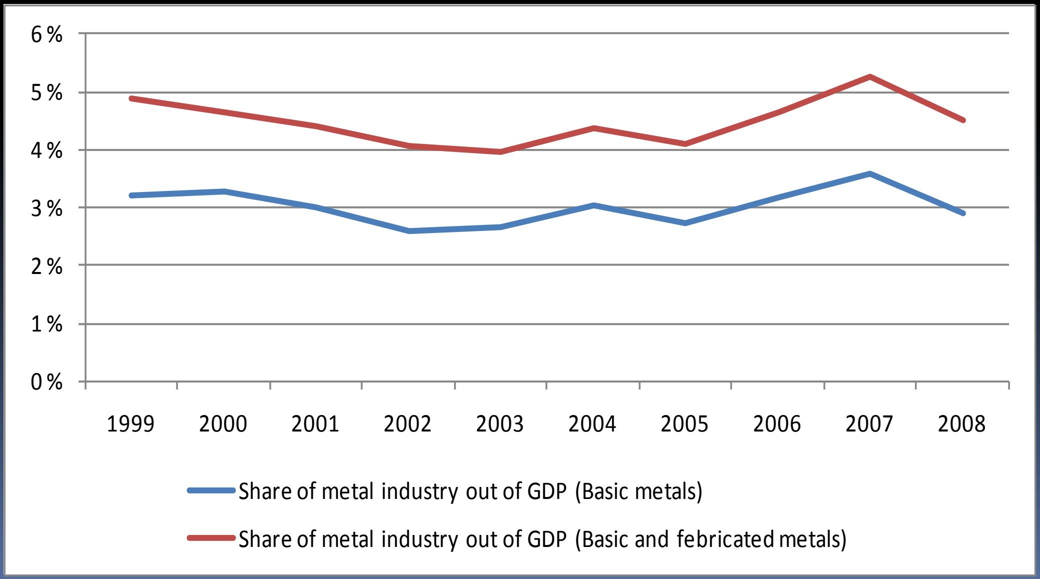
By

Amir Sasson

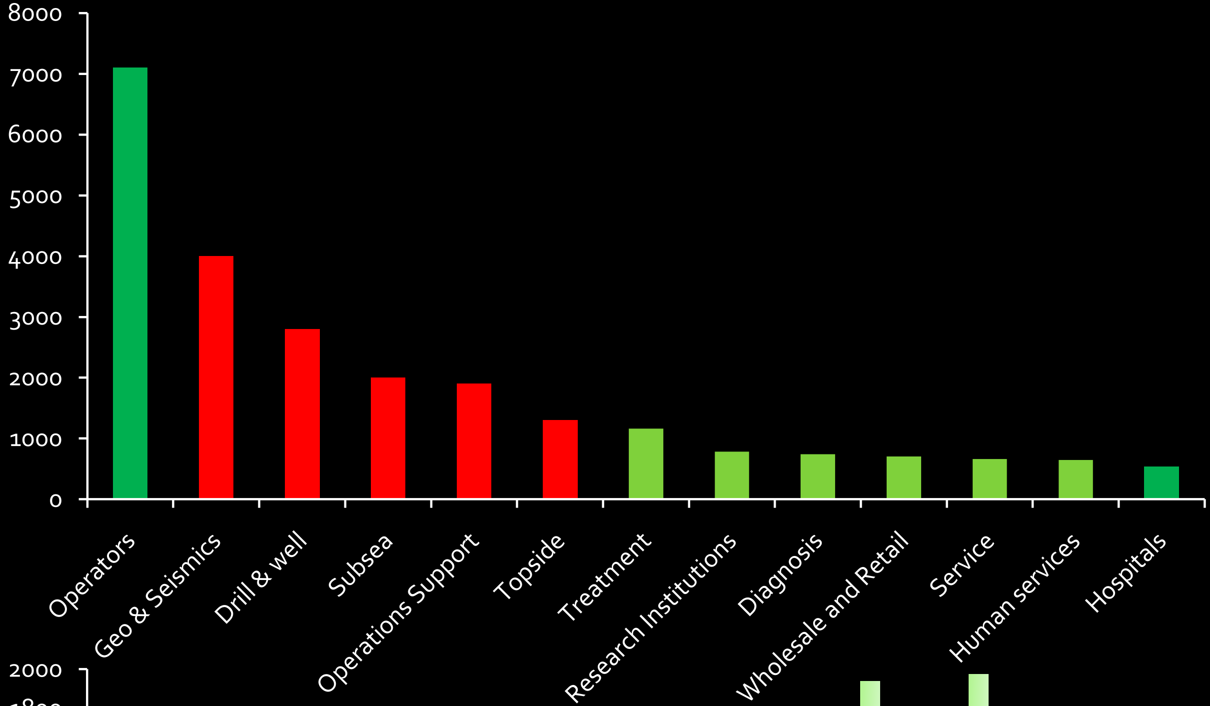
KNOWLEDGE-BASED NORWAY

Consistent portion of GDP

- ❖ While GDP is increasing, the portion of oil is exploding, basic and fabricated metals maintain their national respective market shares.
- ❖ This cannot be said about many other industries



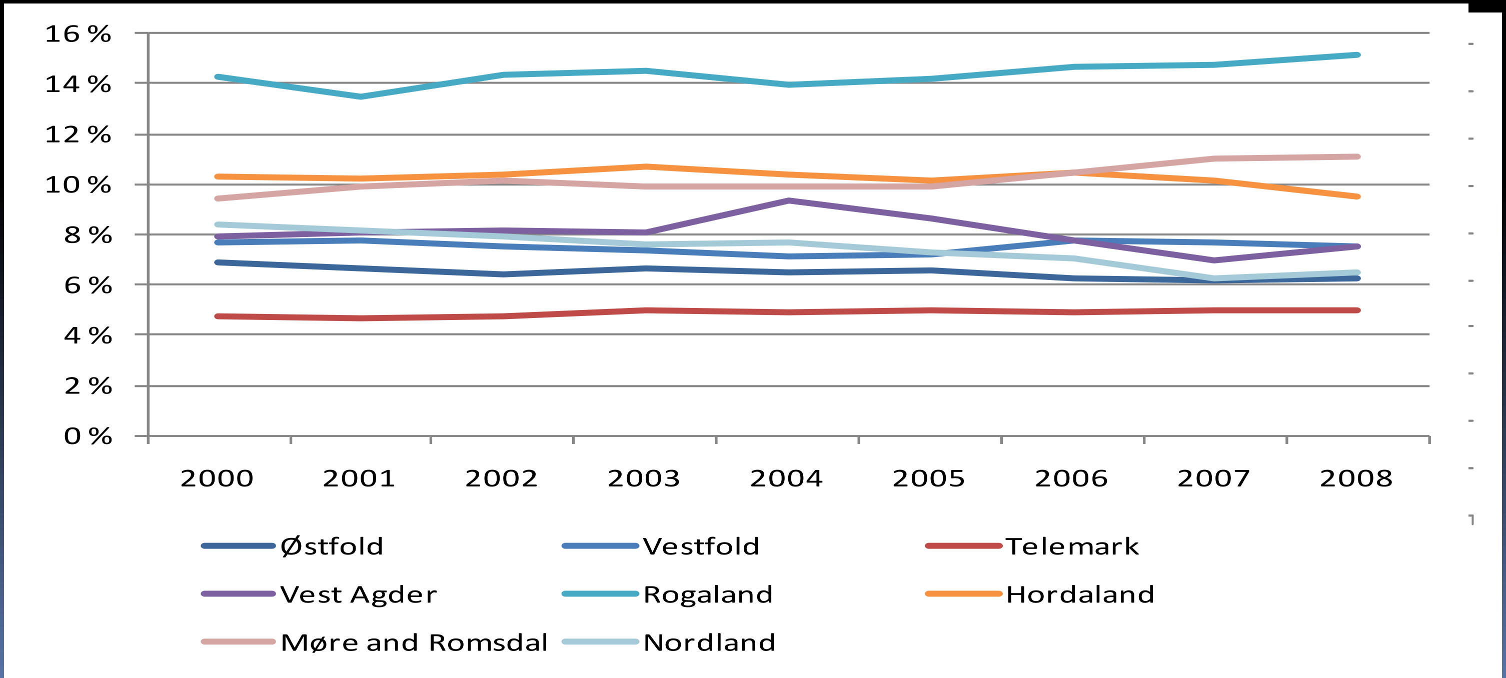
Value creation and locomotives



- ➢ Expected returns in secondary and tertiary production.
- ➢ Above average returns in primary production, but for 2009…
- ➢Not doing worse than many “central” industries e.g. health, tourism, or construction.

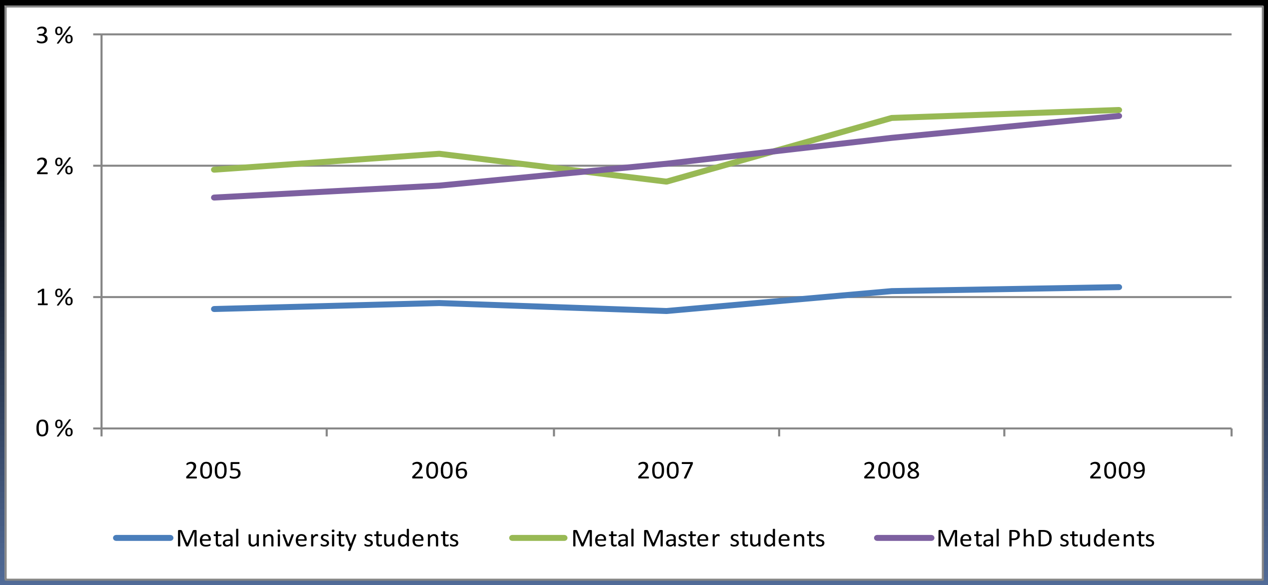
Industrial agglomeration

- Not really…
- Broadly distributed.
- Under a few roofs only.



Educational Attractiveness

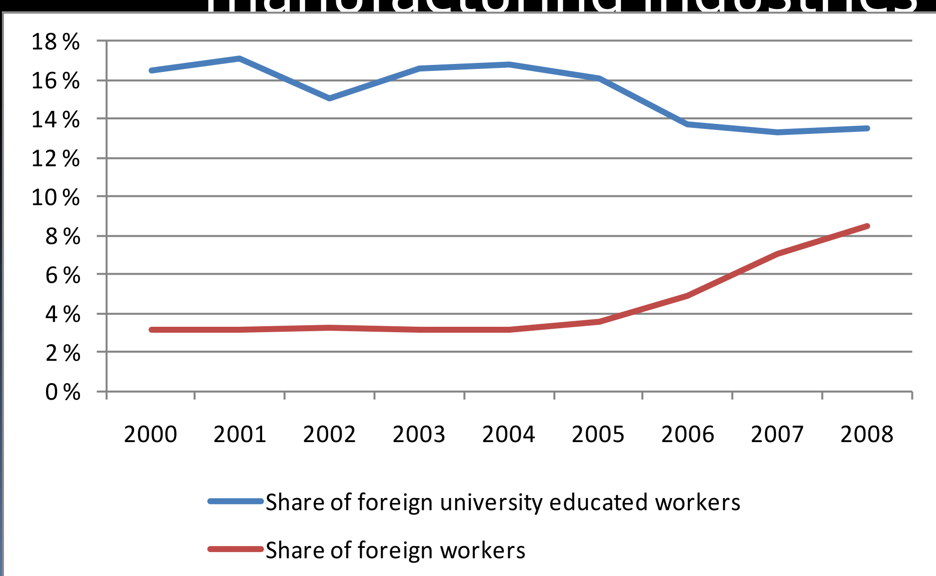
- The pool of graduates with relevant advanced knowledge of metal and materials is increasing in absolute and relative terms.
  - Availability
  - Attraction

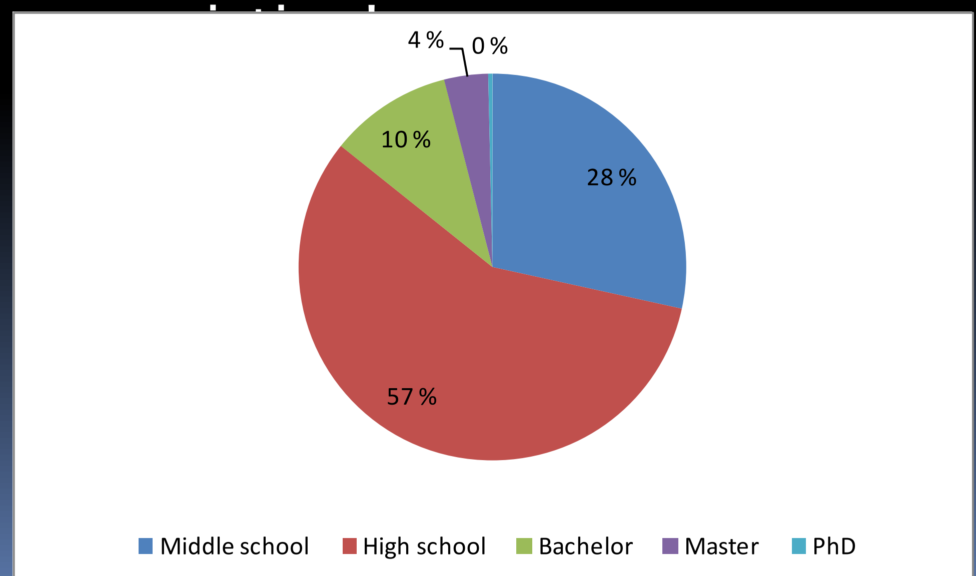


Talent Attractiveness

- Industry composition is in line with the industry’s focus on manufacturing as evident from the composition in other manufacturing industries

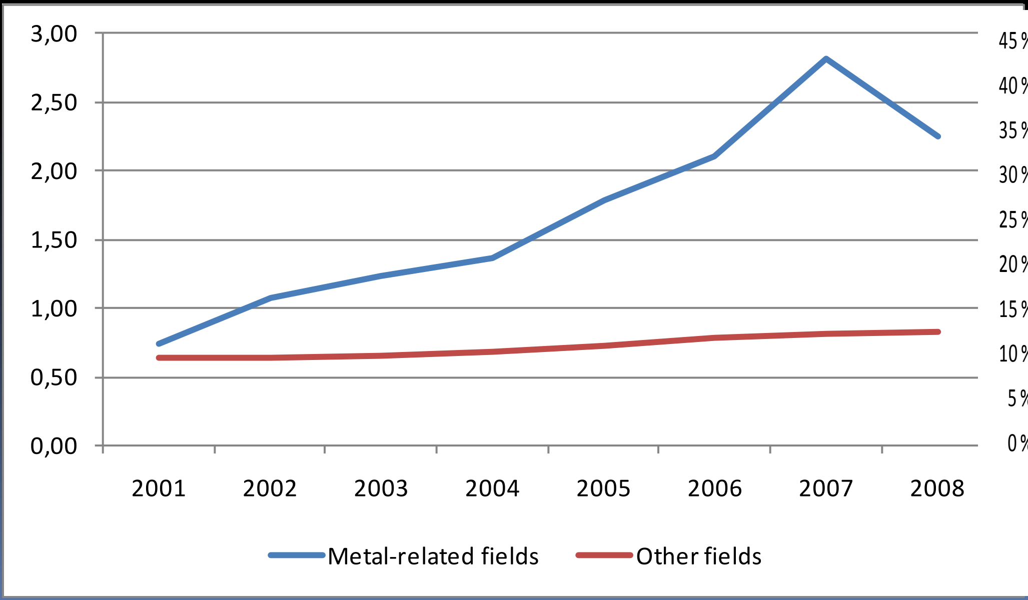
- But:
- It is attractive to the “wrong” type of foreign workers…
- And engineers are

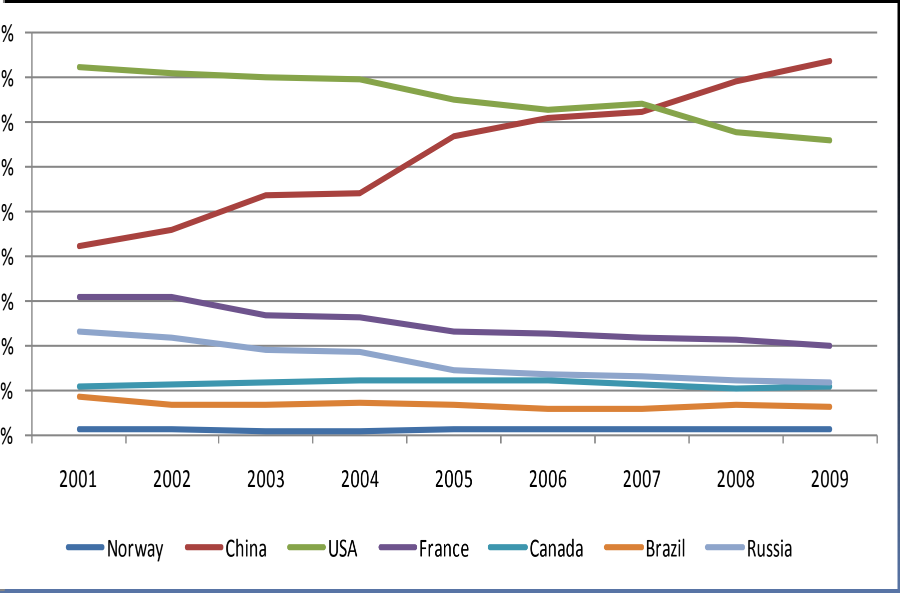




R&D and Innovation Attractiveness I

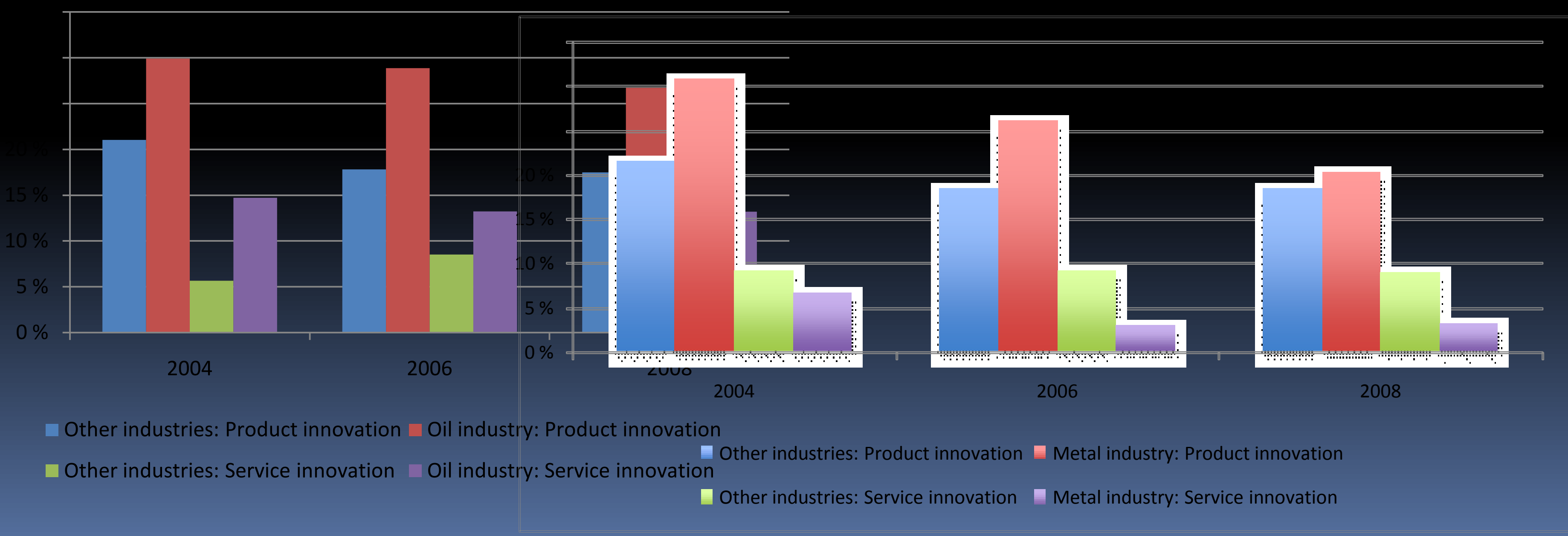
- Metal: Relevant academic contributions are up to three times the national average
- But a marginal role in the global picture of metals and materials.





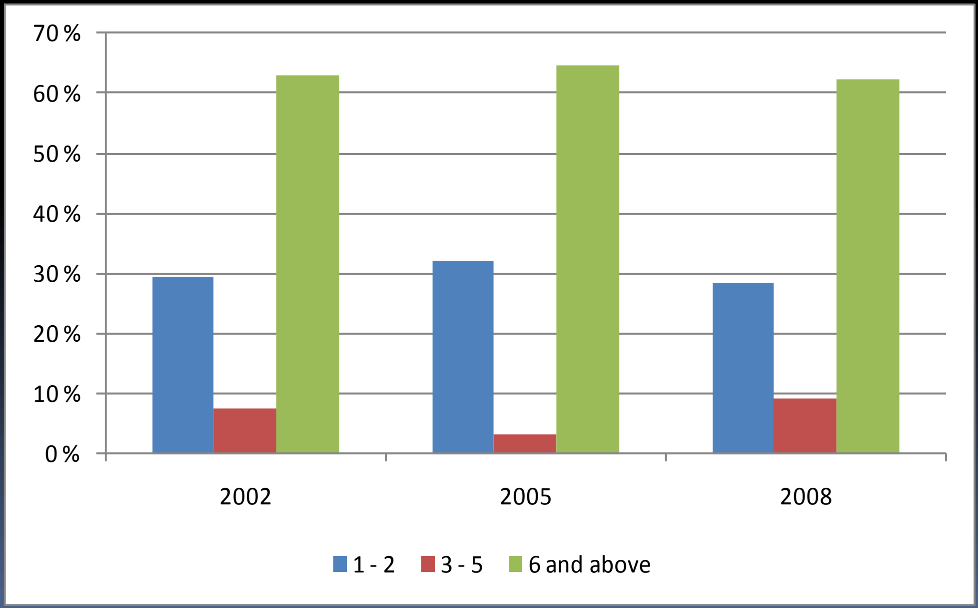
R&D and Innovation Attractiveness II

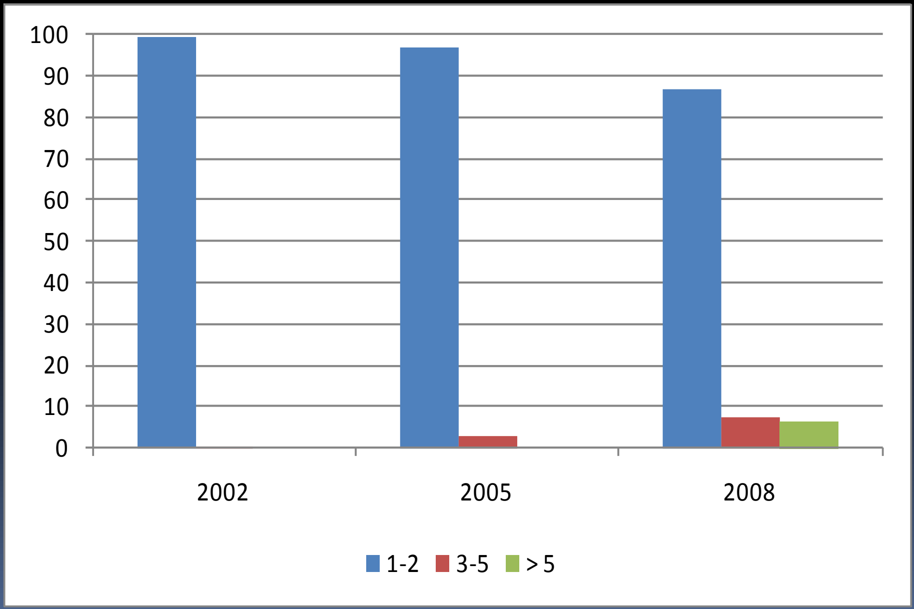
- Oil: Both product and service innovations are significantly above national averages
- Metal: Decreasing innovation activity over time.



Ownership Attractiveness

- Oil: Serial owners are technology developers
- Metal: A serial owner. Attractive for foreign portfolio builders.

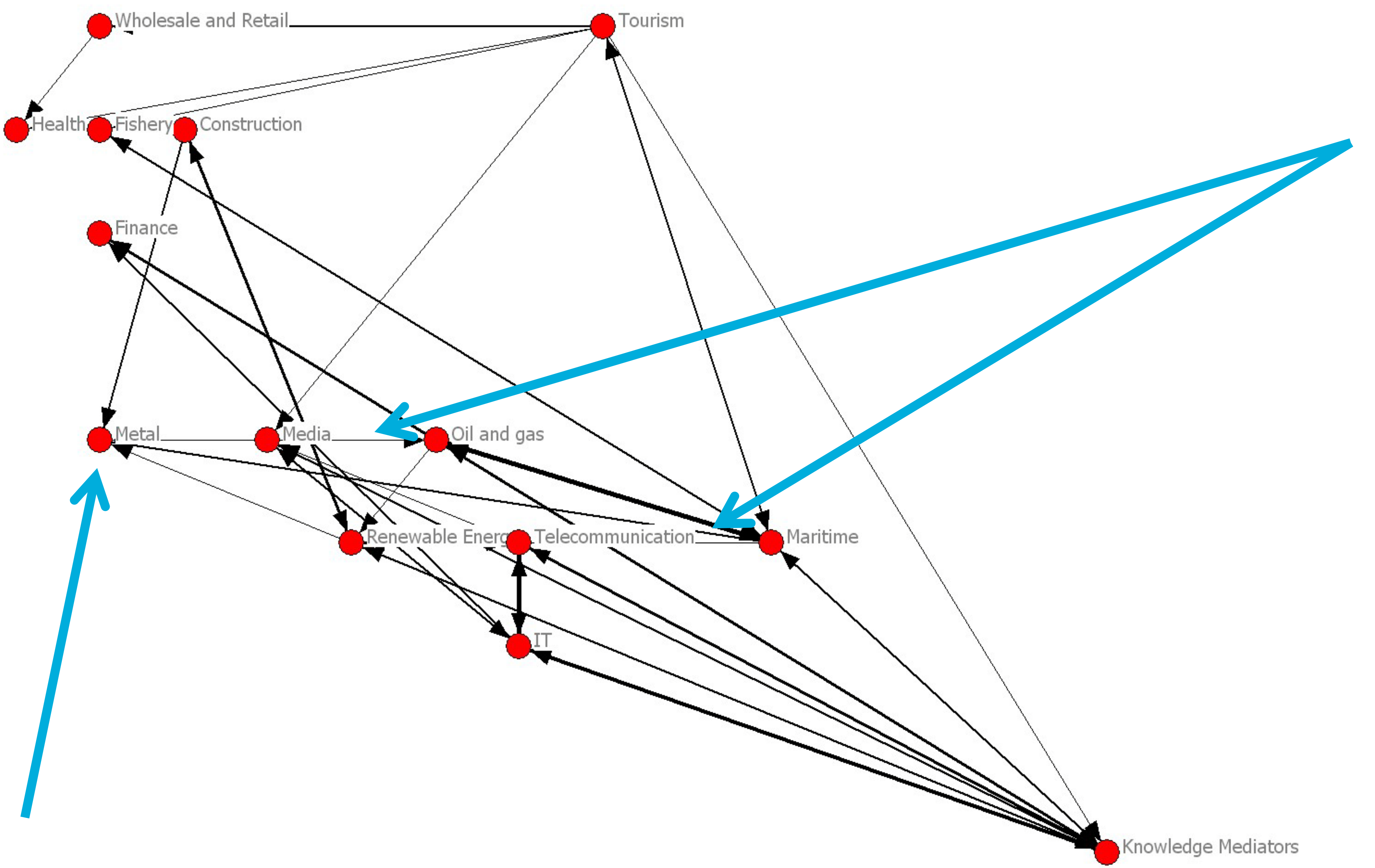




Knowledge Dynamics

- Local competition: Local competitors are of comparatively little significance, with only 17% of firms meeting intense competition locally. Secondary production and tertiary production firms experience high levels of local competition but this is not the source of the toughest competition that they experience.
- Suppliers: Metal firms in all sectors perceive their international suppliers as more technologically leading than their national suppliers. This clearly indicates a lack of competitiveness among local and national suppliers to all sectors.
- Local customers: They are not the most demanding.
- Collaborative linkages: 55% state that R&D institutions are irrelevant in their innovative product developments. This percentage is much higher than in the oil industry (38%) or the health industry (32%).
- Intra-industry labor spillovers: Non-existent

Parts of the metal industry are not isolated within the Norwegian economy.



Competence development

- The metal industry as a whole does not distinguish itself in terms of high investments in intra-firm competence development relative to other industries. Its distribution is similar to that seen in other labor-intensive industries. It differs from investments made in more knowledge-intensive industries.