

OECD WP6

Labour factors of competitiveness in shipbuilding

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1. To outline Labour cost's place in competitiveness of shipyards
2. To consider barriers to solutions to competitiveness issues caused by an ageing workforce, difficulty in attracting young people into the sector and high labour cost

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Low labour cost alone is of limited advantage and is not a reliable route to competitiveness – for three reasons:

1. Labour cost advantage in the shipyard impinges on a relatively small part of the cost structure only*.
2. Low labour cost is often accompanied by low productivity, which can easily cancel out any wage advantage.
3. Advantages from economies of scale and a strong domestic supply chain are much stronger factors of competitiveness than low wage costs.

* For more information on cost structure, see the presentation *Developing a shipbuilding cost index*, given to OECD WP6 at the meeting on 3rd November 2022

Steel	29%
Other Materials	40%
Other direct costs	3%
Labour	18%
Overhead	10%
Total	100%

Advantage from economies of scale and a strong steel and marine equipment supply industry is more powerful

Limited scope for advantage – which can easily be wiped out by material cost disadvantages

Typical average cost structure in competitive commercial shipbuilding excluding debt servicing costs

Highly productive shipyards with a strong orderbook may achieve something like 10 manhours per CGT produced.

In low productivity shipyards performance above 50 manhours per CGT may be found and even above 100 manhours per CGT. Such levels of productivity easily cancel out labour cost advantage.

A new shipyard that is well designed and well invested can take a decade to achieve its potential competitive level and more to achieve high levels of productivity, often requiring support.

1. Advantage is easily negated by poor productivity.
2. Advantage is weak compared to benefits of economy of scale, strong domestic supply chains, supportive government, access to finance and other major factors of competitiveness.
3. Low labour cost is also normally transient in developing economies

1. Low labour cost is not a reliable route to competitiveness.
2. Higher labour cost is not necessarily a barrier but will clearly erode competitive position.
3. There are other labour-related problems in developed shipbuilding nations that increasingly present barriers to competitiveness.

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2. To consider barriers to solutions to competitiveness issues caused by an ageing workforce, difficulty in attracting young people into the sector and high labour cost

1. Ageing workforce.
2. Shortage of skilled workers.
3. Difficulty in attracting young persons into the industry.

There are two relatively obvious solutions to help with these problems:

1. Investment in automation.
2. Optimisation and de-skilling of assembly using the digital twin and simulation and (possibly in future) AI.

But, whilst these seem obvious ways to go, why are they so difficult to achieve – what are the barriers?

1. Volatility of demand.
2. Standard shipbuilding contracts

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There is a general consequence of the business risk that results from demand volatility – investment conditions are difficult and finance can be cautious about investing in shipyards.

There is a more difficult and significant problem, however...

1. Volatility of demand.

2. Standard shipbuilding contracts

- The use of the digital twin for simulation and optimisation of the assembly process requires that the pre-production period of a contract is maximised – it is vital that production does not start too early. Up to 50% of the cycle time should ideally be pre-production work.
- Fluctuations in workload often lead to an imperative to cut steel as early as possible in the cycle, to provide work for the shipyard labour.
- Volatility therefore acts against the required pre-production time.

1. Volatility of demand.
2. Standard shipbuilding contracts
 - Commercial shipbuilding often uses standard contracts that originate from a previous era (SAJ, AWES, AWES, Marad, BIMCI, CMAC).
 - The significance of origin in a previous era is that the contracts under-value pre-production time and work.
 - Specifically, payment terms are often linked to steel production, including start of steel cutting and keel lay.
 - These terms force production to start too early.

1. Low labour cost is of limited significance in shipbuilding competitiveness.
2. Automation and the Digital twin/ Simulation/AI offer the potential to address labour limitations in mature shipbuilding nations, through de-skilling and optimisation of production and assembly.
3. The nature of the industry and the nature of the standard contracts makes this difficult to achieve in practice because of imperatives to start production too early in the cycle time.
4. Strategic thinking is needed for ways to overcome these limitations – solutions cannot be purely technical.

With many thanks to WP6 for allowing me a platform to publish these research results. I hope they are valuable in further improving the understanding of the commercial shipbuilding market.

For further details of our research, please email me on:
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Disclaimers:

- 1. This analysis is theoretical and is produced with the aim of enhancing the shipbuilding industry's understanding of the global commercial shipbuilding market. It is not intended to constitute market advice and should not be used as such.***
- 2. The analysis represents the views of the author only and has not been commissioned or sanctioned by OECD. It is submitted to WP6 without invitation.***