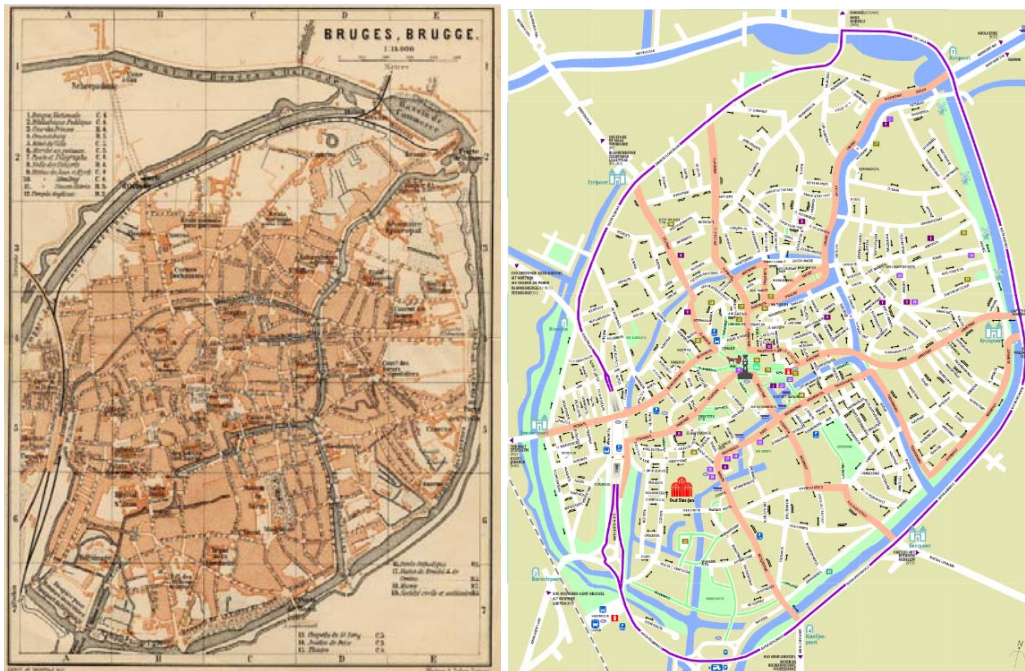


## Inland navigation under the microscope.

*Every evening my neighbors and myself applaud for the 'heroes of care', and in the meantime for all heroes of the corona crisis. Lockdown week 8, a lot has changed. I also pay even more attention to sports. My commuting has changed drastically and now consists of a walk or bike ride as well as the challenge to take an online BBB lesson from the UAntwerp Sport Online.*

Water has always been important for Bruges, and I enjoy it now. While cycling via the ramparts along the canal side, the Bruges-Ostend canal or the Boudewijn Canal (the connection of the Bruges port area with the port of Zeebrugge), I notice that the barges that transport dry bulk and / or break bulk cargo are always empty. ([video](#)). And this both towards the port and towards the hinterland.



## Archimedes' Law

Whether an inland vessel has a lot or little cargo on board can be read from the draft marks or scantlings (see photo, red and white blocks on the side of the ship). Archimedes' law makes it clear that the weight of the displaced amount of water is exactly equal to the weight of the total barge. In addition, when determining the weight of the ship, the water density is taken into account (salt water is heavier than fresh water). Loaded ships are therefore much deeper in the water. The past few weeks, I never passed a fully loaded ship.





100 percent cancellation of river cruises (share of 10% of inland shipping), problems with operating locks (mainly in France), ... were the first consequences of the corona crisis. What problems do the

dry bulk barges face? Linked with supply and demand, imbalance import - export or the impact of the COVID-19 crisis?

### **Dry bulk barges**

Recent data received from the Institute for Belgian Inland Shipping makes it clear that dry cargo barges make up 82.2% (or 939 in number) of the total inland shipping fleet of entrepreneurs domiciled in Belgium (1,142 inland vessels). This segment of the Belgian inland shipping fleet has a total capacity of 1,602 million tons (31/12/2019). At the end of 2009, there were still 1,119 dry cargo ships with a tonnage of 1,524 million tons. Here too, clear developments can be seen towards ever-larger ships. The average tonnage in 2009 was 1,362 tons versus 1,707 tons in 2019.

During these bike rides, I mainly see dry cargo ships with a length varying between 50m and 90m, corresponding to a global tonnage of 550 to 600 tons (type Kempenaar, equivalent to 30 trucks) to 1,000 tons (type Dortmund-Emskanaal, equivalent to 42 trucks). These types of ships represent only 10% of the dry cargo ships. For the larger dry cargo ships (62.2%), I have to cycle along the Albert Canal or the river Rhine, for example. Who knows, I can/may do this in the summer time.



### **Which goods are transported by these ships?**

Over the 2009-2019 period, + 25.73% goods were loaded and + 18% goods unloaded on the Belgian waterways. For dry cargo, the most important segment is the building materials category. The saying in Belgium "if things are going well with construction, the economy is doing well" certainly also applies to inland shipping. The table below also clearly shows the imbalance between loads and discharges.



	2008		2009		2019		%09/08		%19/09		%19/18	
	Loading	Unloading	Loading	Unloading	Loading	Unloading	Loading	Unloading	Loading	Unloading	Loading	Unloading
0. Agriculture	2,402,717	3,461,996	1,695,518	3,432,952	1,580,455	4,109,023	-29.43%	-0.84%	-6.79%	19.69%	-9.22%	-13.02%
1. Food	2,402,374	4,620,483	2,072,189	3,819,603	2,686,129	4,040,713	-13.74%	-17.33%	29.63%	5.79%	-8.55%	4.37%
2. Solid fuels	8,025,657	7,291,841	6,469,001	4,587,596	3,127,512	3,068,397	-19.40%	-37.09%	-51.65%	-33.12%	20.13%	1.70%
3. Petroleum products	19,071,800	19,159,941	17,450,807	19,870,451	23,218,420	16,439,620	-8.50%	3.71%	33.05%	-17.27%	2.60%	-6.52%
4. Ores	3,405,734	6,775,818	2,729,654	3,419,958	1,996,457	3,754,752	-19.85%	-49.53%	-26.86%	9.79%	-22.18%	-9.50%
5. Metal products	5,134,005	5,119,282	2,747,578	4,103,209	4,914,804	5,326,270	-46.48%	-19.85%	78.88%	29.81%	-5.37%	6.84%
6. Building materials	19,775,025	29,067,936	16,401,563	24,856,081	18,510,059	25,488,326	-17.06%	-14.49%	12.86%	2.54%	-2.01%	-5.58%
7. Fertilizers	2,691,340	3,289,802	2,318,319	2,620,054	3,710,476	4,613,381	-13.86%	-20.36%	60.05%	76.08%	12.74%	2.36%
8. Chemical products	9,258,632	8,586,773	8,812,576	7,957,944	16,438,632	18,166,270	-4.82%	-7.32%	86.54%	128.28%	4.33%	6.18%
9. Other goods	13,055,068	17,207,975	11,335,102	15,312,396	14,383,174	21,167,091	-13.17%	-11.02%	26.89%	38.24%	1.10%	-3.12%
<b>Total:</b>	<b>85,222,352</b>	<b>104,581,847</b>	<b>72,032,307</b>	<b>89,980,244</b>	<b>90,566,118</b>	<b>106,173,843</b>	<b>-15.48%</b>	<b>-13.96%</b>	<b>25.73%</b>	<b>18.00%</b>	<b>0.82%</b>	<b>1.42%</b>

Source: own compilation based on Observatorium ITB, 2020

Here too, it is too early to gain insight into the proportions of the economic impact of the corona crisis for inland shipping. Parallel to my previous article ([link](#)), I compare with the previous crisis. The figures show that the financial and economic crisis of 2008-2009 did not spare any goods category. In 2009, inland navigation experienced lower demand (shift in the demand curve) as well as changes in the inland shipping fleet (shift in the supply curve). The lack of cash reserve, especially among ship owners whose ship had not yet been paid off, explained the rationalization of the inland shipping fleet.

### **Impact COVID-19?**

The comparison of the last two years, shown in the last two columns, hence pre COVID-19, suggests that the dry cargo was already in a crisis situation. With quasi-normal water levels on the Rhine in 2019, there was:

- Decrease in agricultural products: linked to harvest volumes as well as the challenge of shifting livestock farms from Western Europe (emission problems) to Eastern Europe
- Decrease in solid fuels: linked to a mild winter as well as to the challenge of changes in the energy sector (the debate about coal-fired power stations - shutdown of the coal-fired power stations in Ensdorf are shifting traffic to the new power station in Datteln, Germany)
- Iron ore decline: reduced supply of steel products, a decrease in the German car industry
- Purchase of industry and construction: nitrogen decree in the Netherlands

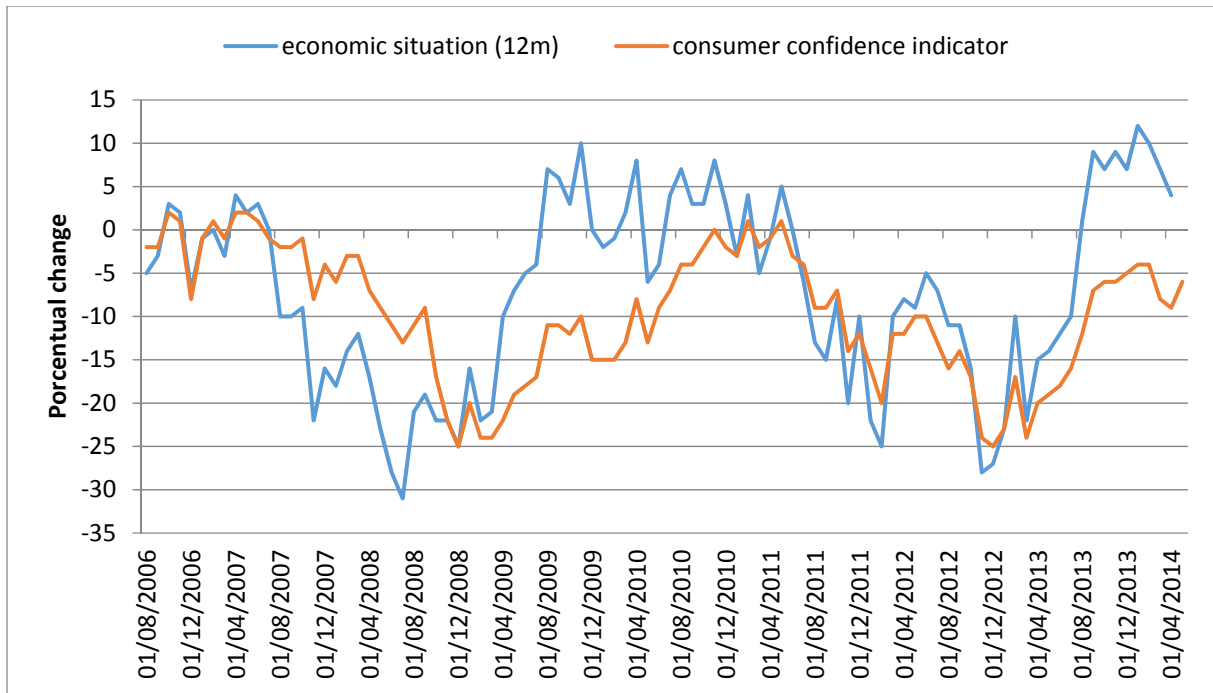
The situation above did not worsen at the start of the corona crisis. In the meantime, this situation changed: a further decline in the industrial product and construction industry (immediate cessation of motor vehicles, production of construction materials being stopped, etc.) will not miss its effect in the segment of dry cargo barges. Unrest is expected in the coming months.

Quid the other segments? The liquid bulk (petroleum products, but also oilseeds such as rapeseed, sunflower seed and soybeans) is more or less keeping pace; while container shipping experienced tremendous growth in 2019. Congestion acts as a driver here. There is a close relationship between containers transported by inland shipping to / from the hinterland and maritime transport. And, it is precisely this segment that has a hard time; it is therefore expected that the corona crisis will also have serious consequences for inland container shipping.

### **Outlook**

In my previous blog/article, I spoke of a sharp V followed by a U, more and more the sector speaks of a Nike effect (inspired by the logo). So in concrete terms, an uncharacteristic shock (acute, immediate and complex on the supply and demand side).

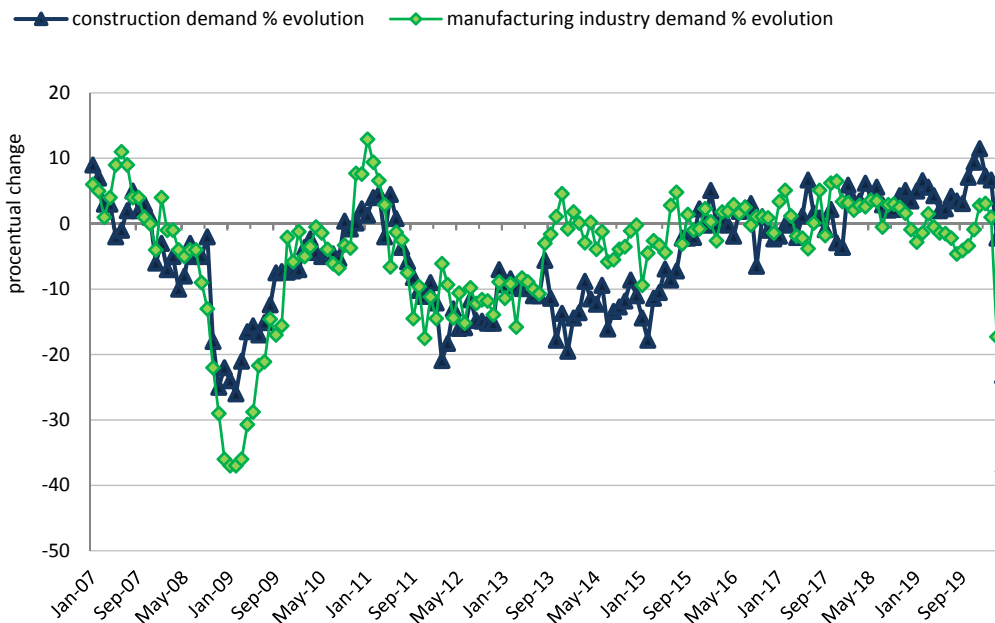
To get an idea of this, I compare the business indicator of the National Bank of Belgium with the consumer confidence indicator. The former is a proxy for the supply side of the economy; while the latter measures the evolution of the demand side. These indicators are drawn up on the basis of business surveys, so usually of a qualitative nature, and show the difference between the percentage of positive and negative answers (more info: see [stats.nbb.be](https://stats.nbb.be))



Source: own compilation based on statistics NBB (2020)

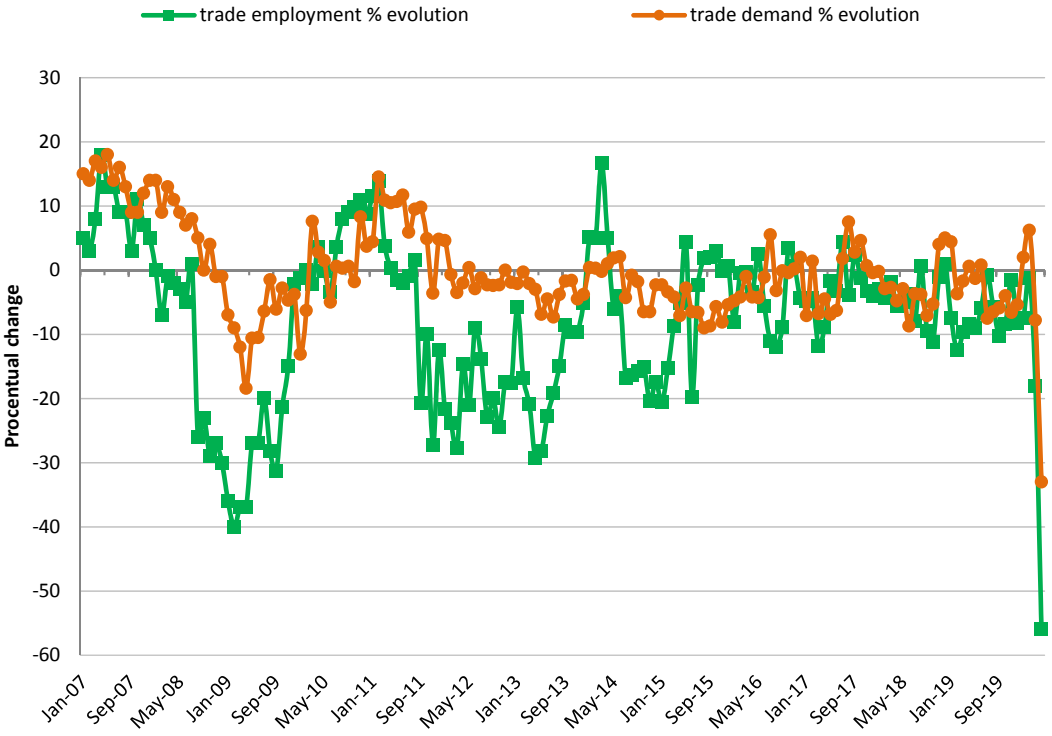
Compared to the financial and economic crisis (now renamed "minor crisis"), the business indicator dips much deeper. Clearly, the questions were answered very negatively. There is no mistaking the impact of the corona crisis. Meanwhile, the economy is rebooting, supply is recovering, but demand will have to recover.

What are the consequences for the inland shipping sector? To this end, I look at the percentage change in demand for the manufacturing industry and construction; both an important source of dry cargo for inland shipping. The fall in these indicators appears to be comparable to the previous crisis. This finding is not encouraging for the inland shipping sector.



Source: own compilation based on statistics NBB (2020)

Trade is also linked to transport. Pessimism is more pronounced here than the processing and construction sector. Very negative are the negative outlook for demand and employment for this sector. This effect may be reflected in inland container shipping.



Source: own compilation based on statistics NBB (2020)

The National Bank of Belgium is now also looking at other indicators (freight traffic, electricity and gas consumption, ...) and has concluded that all indicators are moving in the same direction.

The permanent damage to the Belgian economy, so no rapid recovery (no V-curve), also means economic damage to inland shipping. But ... what does it mean for the individual inland skipper? Those with cash reserves and / or tied to a contract may navigate through this crisis with the least damage. For barges active on the spot market (lower rates or even no work), the economic impact may be much greater.

I think it would be particularly interesting to constantly monitor the global economic impact of COVID-19 for this sector, an essential means of transport in Europe, and to study how this sector adapts to changing market conditions. Will the sector respond to automation, digitization, ...? Maybe next year, I will see a (semi-) autonomous sailing dry cargo ship in Bruges.

## Interested in more research about the inland shipping sector?

SYS, Christa, Eddy VAN DE VOORDE, Thierry VANELSLANDER & Edwin VAN HASSEL: "De binnenvaart: Traditionele modus, innovatieve toekomst?" 2017/004

SYS, Christa: "Laden en lossen in de binnenvaart : onderhandeling, regelgeving of gebruik?" ISBN 978-90-382-2444-2 - Gent, Academia Press, 2014, 269 p.

SYS Christa [edit.], VANELSLANDER Thierry [edit.]: "Future challenges for inland navigation : a scientific appraisal of the consequences of possible strategic and economic developments up to 2030", ISBN 978-90-5487-854-4 - Antwerp, University Press Antwerp, 2011, 240 p.

AL ENEZY Osama, VAN HASSEL Edwin, SYS Christa, VANELSLANDER Thierry: Developing a cost calculation model for inland navigation, Research in transportation business & management - ISSN 2210-5395 - 23(2017), p. 64-74, Full text (DOI uitgever): <https://doi.org/10.1016/J.RTBM.2017.02.006>, Full text (open access): [https://repository.uantwerpen.be/docman/irua/569856/140698\\_2019\\_02\\_22.pdf](https://repository.uantwerpen.be/docman/irua/569856/140698_2019_02_22.pdf)

VAN HASSEL Edwin, VANELSLANDER Thierry, SYS Christa, "Inland waterway transport : challenges and prospects" / Wiegmans, Bart; et al. - ISBN 978-1-138-82671-7 - Abingdon, Routledge, 2017, p. 71-98

VERBERGHT Edwin, "Innovation in inland navigation : failure and success: the European case" ISBN 978-90-5728-646-9 - Antwerp, University of Antwerp, Faculty of Economics and Business, Department of Transport and Regional Economics, 2020, 290 p., Full text (open access): <https://repository.uantwerpen.be/docman/irua/11cbe4/165920.pdf>