Servitization of Economy and Trade

By the conceptual team of Global Arena Research Institute (published August 2024)

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"Working and conceptual papers" are analytical reviews of existing resources, including academic literature, think tank analyses, and inputs from formal institutions such as the World Bank, European Commission, and OECD. They are not intended to present original research but rather to build a background for developing research concepts used in data-driven analytics. Originally intended as internal working material, these papers are published when they are deemed to be of broader public interest. This paper is part of a series of "conceptual papers" produced as part of a project supported by the International Visegrad Fund and Konrad Adenauer Stiftung in Prague.

Executive Summary

Servitization as sectoral change and firm-level development

Servitization refers to an economic phenomenon in (at least) two aspects: 1) increasing share of the service sector in an economy (compared with manufacturing and agriculture) and 2) increasing share of servitization in business operations, including service as input/output.

Benefits of servitization

Benefits of servitization for the firms include higher profit margin and lower costs. A servitized economy is considered as a "developed" or "mature" economy, with relatively higher labour productivity and higher GDP. Sertization can be observed in most major OECD economies but also other emerging markets.

Drives of Servitization: unbalanced growth, income elasticity of demand and outsourcing

The 3 dominant explanations of the servitization in developed economies include: 1) the unbalanced growth across sectors, potentially due to the different margin rates and productivity growth; 2)the income elasticity of demand of different products (for example, high income earners may subscribe to all major streaming services but can not eat 10 kg meats a day); and 3) outsourcing the manufacturing to other countries to rationalize cost structure, which was made available thanks to rapid globalization.

Servitization being different from digitalization - yet interdependent

Servitization is very often mistaken as digitalization, which is a conceptually different economic phenomenon. Digital economy refers to the economic activities in the development, production, consumption etc of digital products and services. Services make up a great percentage of the digitized economy does not mean servitization equals digitalization. However, well-established digital infrastructure and a flourishing digital

economy serves as an important stepping stone of servitization, especially in the global economy.

Servitization in manufacturing as vertical integration of production

Servitization of manufacturing is a result of manufacturers integrating service components in their business processes, blurring the line between manufacturing and service providers. The servitised manufacturers directly face clients, understand and gather first hand information of market trends, are able to capture the service rents, and waive the transaction costs (partially), making their products more competitive. That is to say, some manufacturers are actually winners in the wave of servitization while some others fade out gradually.

The Service Sector

The existence of trade is dependent on the availability of goods and services to buy and sell which consequently fuels economic activity. Services are products that exist only in name, that is nominal, but the effects of it can be observed. The growing share in service economies comes from large turnovers with less expenditure than what would be anticipated with an industrial economy.

Service economy is a phenomenon where a share of economic activity is focused on providing services rather than tangible goods (Cambridge). In some countries, the service sector takes a great share of economic activity. As noted by the OECD (2000: 7-9), a service economy involves the following activities:

- The provision of nominal products to the consumer and the consumer pays for the effects of the product
- The provision of a tangible product to the consumer and the consumer uses it short-term to fulfil a specific purpose without assuming ownership, therefore making a consumer good a service. This is referred to as **servitization** (Kowalkowski, Gebauer, Kamp & Parry 2017: 1).
    - The tangible product is being leased for short term use by the consumer
    - The consumer pays for the effects brought about by the tangible product in use and they only pay based on what is required or expected.

Services and the servitization of consumer goods has acted as a huge source of revenue for businesses. As a result, the economy becomes **servitized** which is when a greater share of the economy focuses more on providing services and servitized consumer goods. As economic activity in the service sector grew, the possibility of subjecting services to international trade became realised. Due to the large turnover that comes with service economies, countries that also deal in trading of services can also opt to increase their share of exports from goods exports to service exports. This is referred to as **servitization of trade**.

Schematic of the Tertiary Economic Sector

From theory, the service sector is a subsector that falls within the tertiary sector of the economy which involves the provision of finished and/or semi finished goods and services to the consumer.

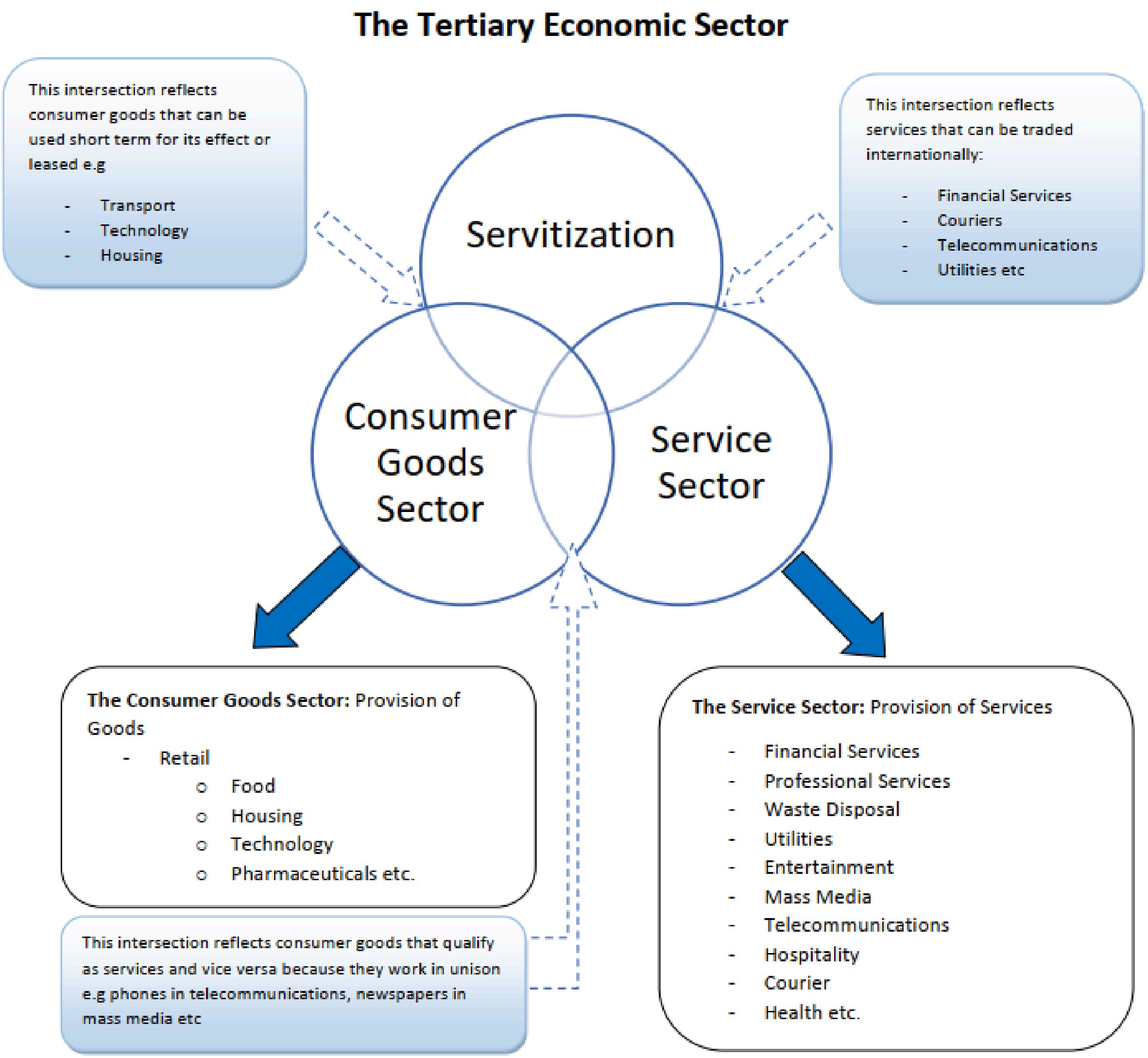


Figure 1. Model showing the tertiary economy (Photo by Nabila Budiaki)

The diagram above depicts the ways in which the tertiary industry can be divided to provide a snapshot to how this sector operates and what exactly qualifies as a service sector economic activity and what can be servitised.

Why Services are Provided

Services are becoming a more popular product for trade for the following reasons:

- **Less Capital:** Both servitized consumer goods and nominal services require less start up and working capital compared to consumer goods sold for direct ownership and consumption
- **More Profitable:** Less expenditures are made as goods are not being produced at all or goods are being produced at limited quantities
- **More Turnover:** Businesses can set prices based on the impact of the service rather than relinquishing ownership of the product entirely and valuing it based on the materials used
- **More frequency:** Consumers may require to use a service again at a later date as they have no ownership of the product, causing them to return to make another transaction
- **More business opportunities:** With growing technological and digitalisation advancements, more opportunities become available for innovation of services

Feasibility of Servitization

Different countries have adopted a service based approach in sharing of the economy which is contingent with provision of services and servitized consumer goods. Despite the evidence that suggests a service based approach is more efficient affirmed by the reasons stated above, there is also counter evidence suggesting that it may not be a suitable approach for every economy when regarding the factors that create a successful service economy, especially when it comes to servitized consumer goods.

The United States of America and Germany are both in the top three of the world's biggest exporters in terms of total exports and both countries have dedicated a large share of their economy to the service sector.

The United States of America

According to Statista (2020), the United States is the country with the largest service economy in the world. It takes up roughly 76% of the country's GDP, contributing 15 trillion USD. The country's OECD profile (OECD 2018) shows that 690 billion USD was valued for service exports which made up 34% of total exports. The graph below adopted from the US Bureau of Labour Statistics (2021) shows the share of economic activity by industry within the service sector. Originally, there were 48 entries but they have been grouped together by Statista (2020).

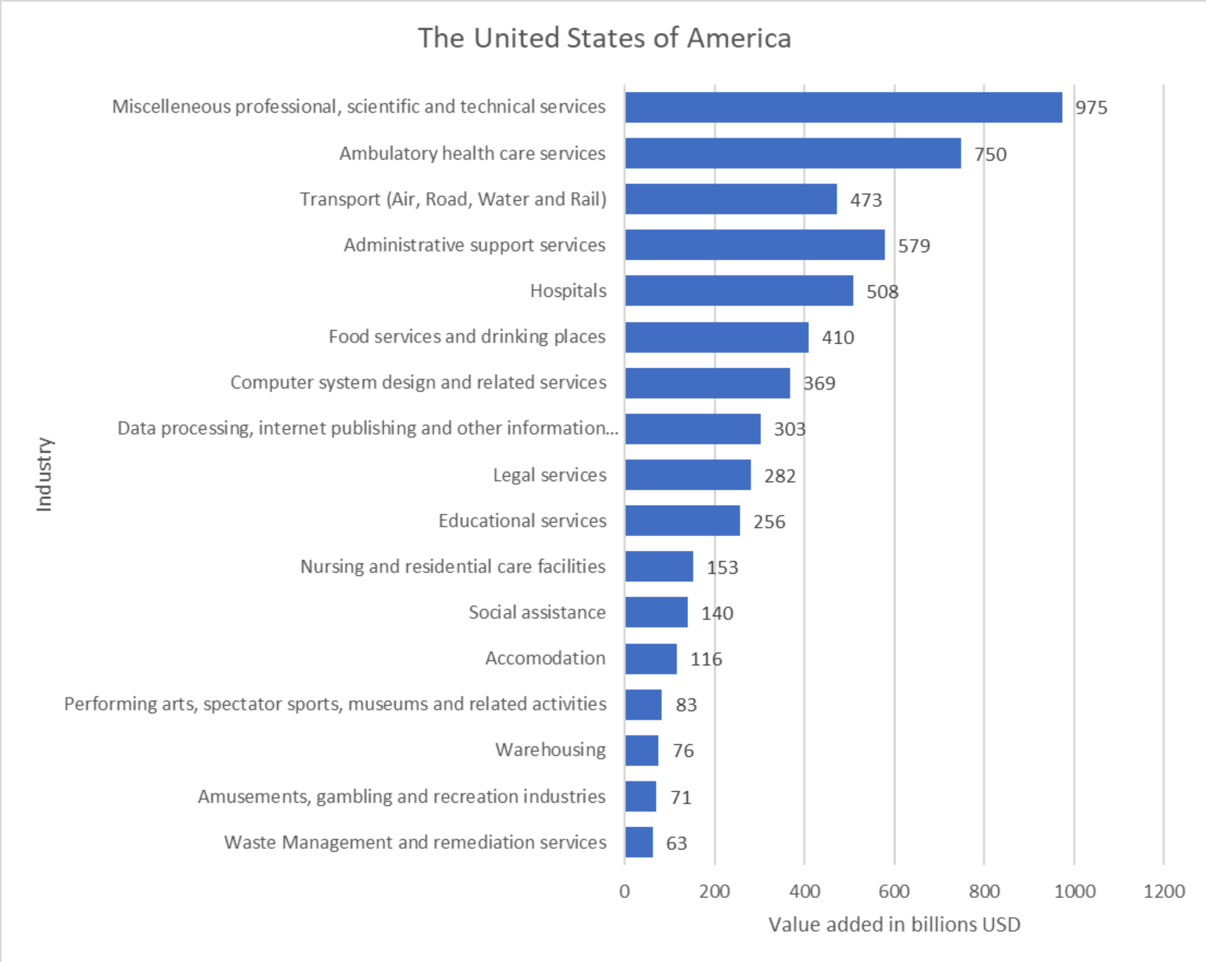


Figure 2. Value of the American Service Sector in 2020 (Photo by Statista)

Servitization of consumer goods has also been largely achieved in the United States due to technological advancements and the diversity in the industries available (Tilliette, Humphrey, Bose and Gopikumar 2021). Moreover, they go on to say:

> "... Data is fueling the shift to servitization. Entire industries are moving from traditional customer interactions to connected, long-term customer relationships. They're offering continuous, low-friction and personalized interactions that drive new levels of convenience for customers. But the changing of the status quo has also led to changing expectations. Customers want services and products that are reliable and always on, tailored to their needs, and developed and delivered in a socially responsible manner. (Tilliette, Humphrey, Bose and Gopikumar 2021)"

Due to the digitalisation expressed in the current world, consumers can be afforded the ease to acquire their needs without the hassle in transit, retail deliveries, entertainment and more.

However, it can be argued that the service sector thrives in America due to its large population, the domination its service industry has worldwide, as well as politico-economic factors that leave individuals reliant on companies' services which drives up economic activity. In the transport industry, car rentals, public transits and taxi hires are considered to be servitized goods as it forgos the need to possess a car to commute from one place to another. An article by Bliss (2019) highlights studies that have found that Uber and Lyft have contributed to a decline in public transportation use which is a side effect of the limited, underfunded and poorly maintained public transport systems in most of America. Therefore, many have become reliant on Uber and Lyft and must pay for their services without a feasible alternative.

Furthermore, servitization is not applicable in several industries and in the ones where it is possible, it runs the risk of **market saturation**; the inability to sell goods and services due to an abundance of product and lack of market to acquire it**.** Evidence of this has been noted from the recent drop in revenue observed by Netflix experiencing a large drop in shares and an exodus of over 200 000 subscribers due to competition from emerging platforms like HBO, Disney + and others, consumer loopholes of password sharing which prompted them to raise prices and decline in user satisfaction (Sperling 2022), similarly to how Neflix phased out cable television which is on route to be obsolete by 2025 (Agarwal, Agarwal, Misra and Pabshetwar 2019).

In regards to international service trade, the United States of America fairs well in service exports as noted from their OECD profile (2018) as they made a profit of 238 billion USD in service trade with exports exceeding imports as shown in figure 3 below. The biggest fraction of service trade is held by personal travel, business, professional and technical services, and financial services. The reason being is likely due to the global dominance of American companies and corporations that have contributed to their success. The dominance of American companies is believed to be due to their economic advantage after 1945 which allowed them to develop much faster than other nations that were impacted worse after the war (Schake 2016: 103). As a result, much investment was placed into American startups, research and scientific fields received research grants and funding and they franchised several businesses overseas while the situation was in their favour, which have allowed them to possess a great share of the service industry in the whole world.

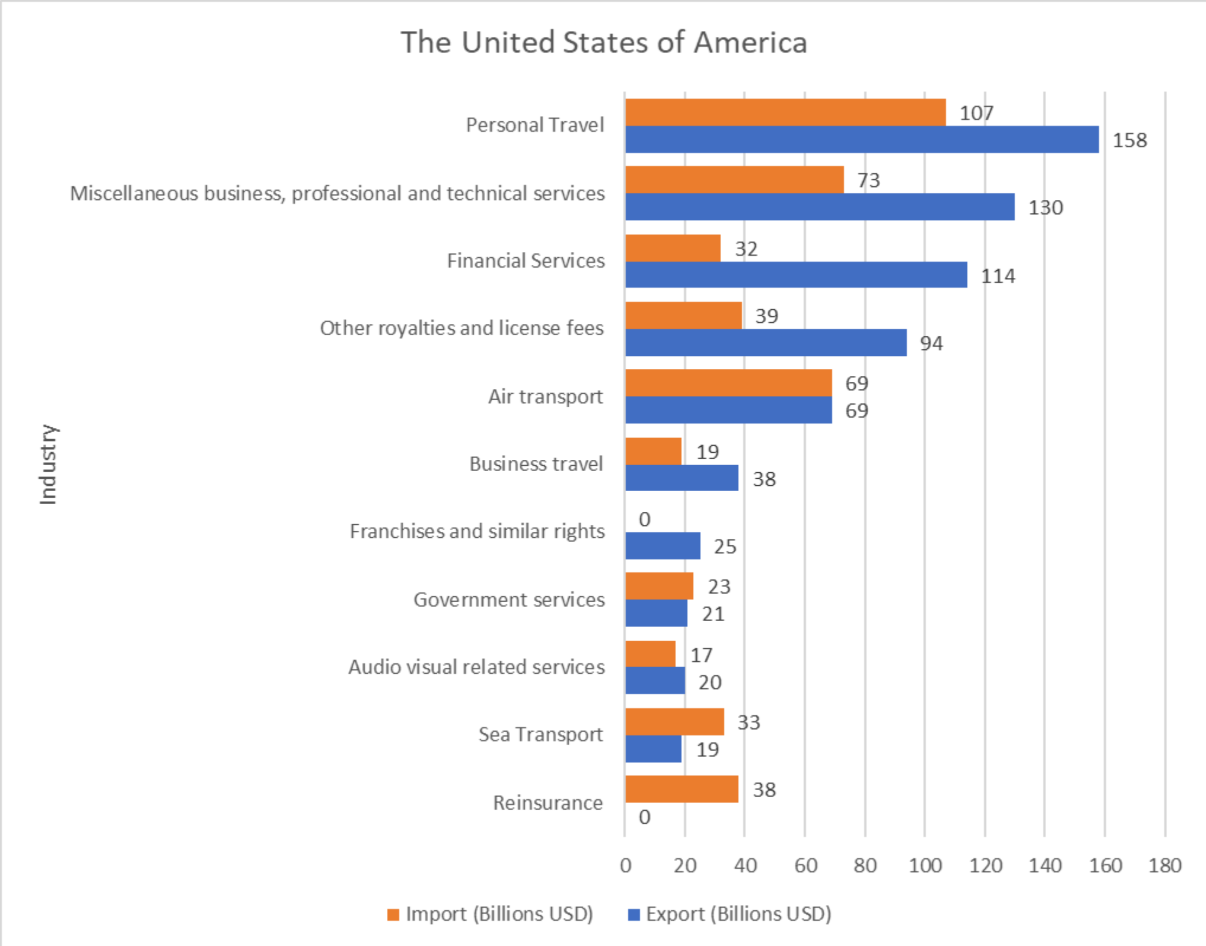


Figure 3. Value of Imports and Exports for United States in 2018 (Photo by Nabila Budiaki)

Germany

The World Bank (2020; 2020), values Germany's service sector to make up 70% of the country's GDP, contributing 2,4 trillion USD. 2018 statistics from the OECD portal (2018) indicate that 231 billion USD was valued for service exports which makes up approximately 15% of total exports. The graph below adopted from the Federal Statistical Office of Germany (2018) shows the share of economic activity by industry within the service sector. Originally, there were 33 entries but they have been grouped together for simplicity.

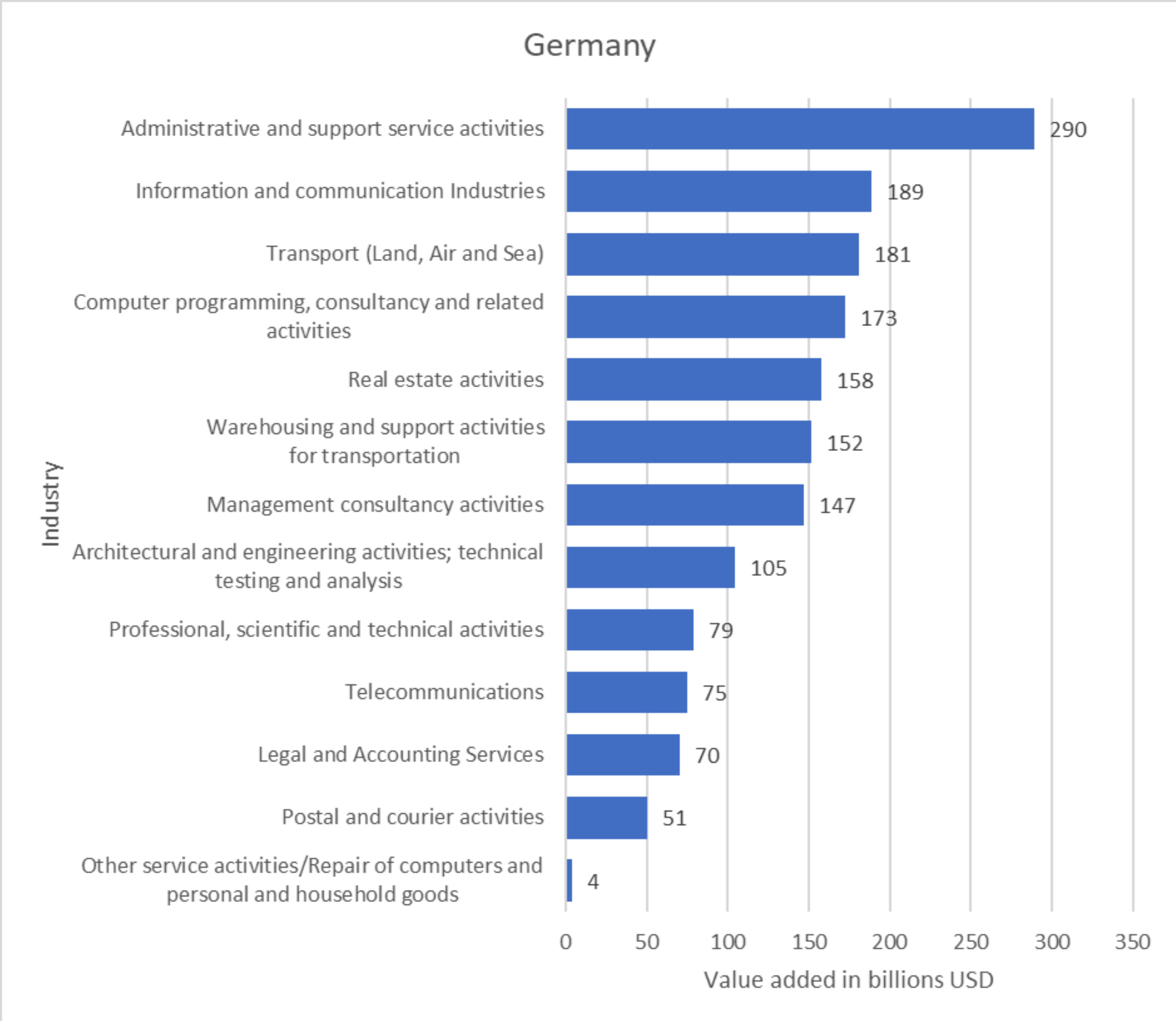


Figure 4. Value of the German Service Sector in 2019 (Photo by Nabila Budiaki)

The share of the service sector in Germany is not as vast as the United States, possibly because it has a smaller population and a historical context different from the country in question. However, Germany has been noted to garner success from servitized industries especially in relation to their strong automotive industry, service delivery and logistics industry.

The success of the German economy has been coined as the 'German economic miracle' by historians (Henderson 2008). Henderson (2008) notes that the decrease in tax policies, the governance by Western Allies and the sustainable, satisfactory job market and employment culture tailored from it led to great economic growth which eventually allowed for the revival of the automotive industry which was left in shambles after the war. Boden and Hazen (2014: 6) state that as Germany placed more focus on moving towards a service heavy economy over a manufacturing economy, more money was invested into research and development. Recent innovative business models have been developed in the german automobile industry: car subscription services which require a monthly fee to use the car and potentially upgrade or trade in the car, and car sharing services using an app to unlock access to a car available in different spots of towns and cities to drive short term from one point to another within the same locale (Stuchlik 2021: 9). These have driven up sales while decreasing manufacturing costs.

Even though Germany was the third highest service trader in the world in 2018, it still managed to run a deficit of 12 billion USD (2018). The second largest service trader was the United Kingdom after the United States but their exports were not as diverse and they ran a greater deficit than Germany at 107 billion USD. (2020) which is a possible side effect of the global dominance of the American service sector.

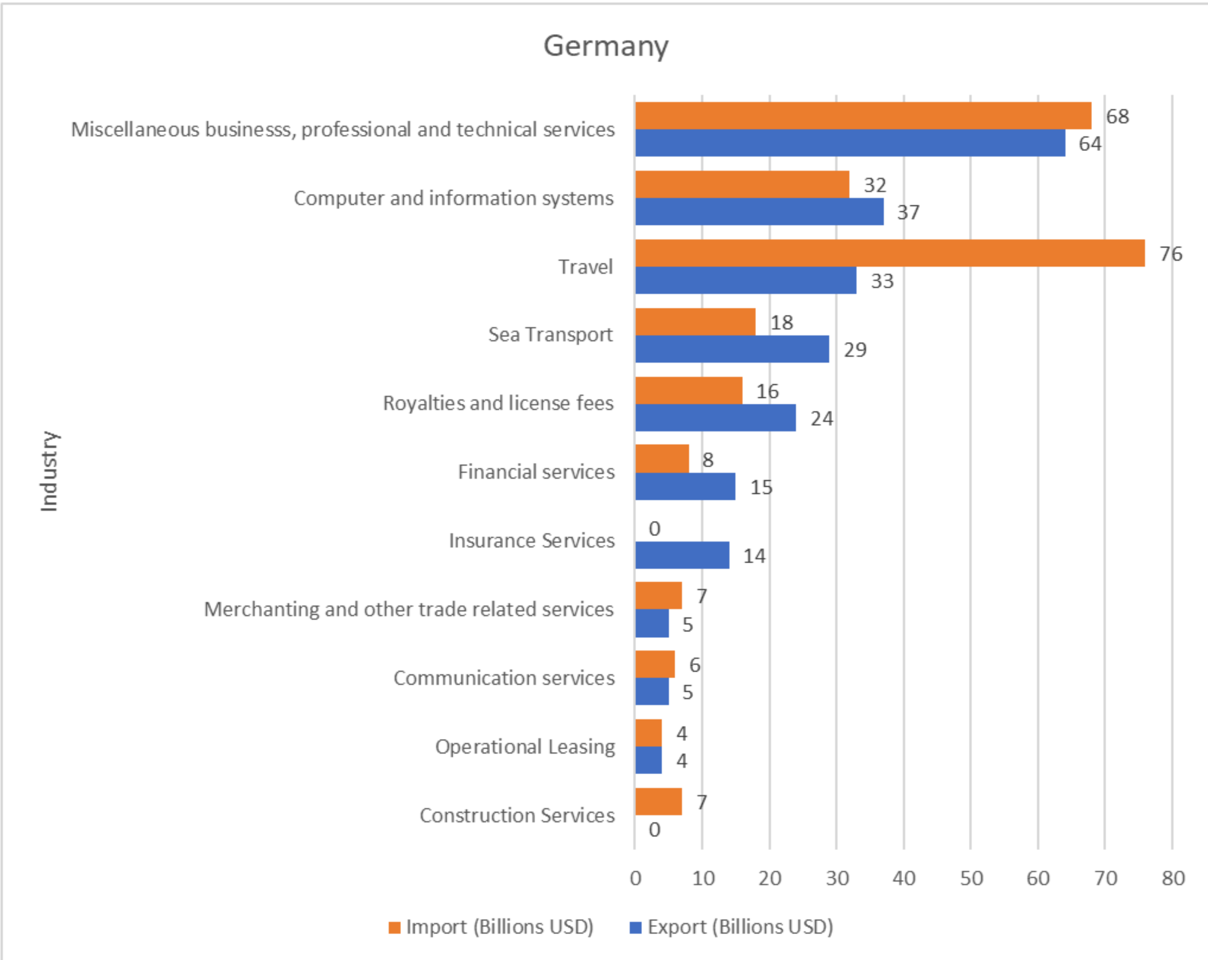


Figure 5. Value of Imports and Exports for Germany in 2018 (Photo by Nabila Budiaki)

The highest export sectors are travel, computer and information systems and miscellaneous business, professional and technical services which include logistics and warehousing. Some German companies are the highest grossing in the world, particularly Deutsche Post DHL Group and Lufthansa which were both included in the 2020 Fortune 500 list (Forbes 2020). DHL ranks first in the world in third party logistics providers in terms of turnover, directly followed by two other German companies: Kuehne + Nagel and DB Schenker (Armstrong and Associates Inc) while Lufthansa ranks 5th globally with revenue valued at 15 billion USD (Statista 2020) with

Frankfurt Airport being the 4th busiest international airport in the world (Airport Council International 2022).

The global success of the German logistics, warehousing and travel industry is believed to be attributed from a geographical advantage. Rashton and Walker (2007: 62) state: "Germany has a good strategic location at the heart of Europe and an excellent transport infrastructure that allows it to gain maximum benefit from this advantage. The efficiency of Germany's transport system, together with its seaports, have played a key role in enabling it to become a key European exporting nation."

Furthermore, other services such as financial, insurance and royalty based services also succeed due to franchising regulations in the EU that makes it relatively easy for companies to expand in other EU countries as it is believed to be an 'entitlement' or an EU citizen (Europa.eu). As a result, well established German companies can branch out into other neighbouring countries and establish service based business there. However, the European Parliament (Abell n.d) have stated that there is great potential for stimulating economic activity in the EU but most services are over concentrated in 25% of EU countries which generate around 80% of its total turnover, showing that there is room for expansion.

Factors that contribute to feasible servitization based approach in businesses

Servitization of trade and global competition

As the volume of international trade increases, countries do not only trade goods but also services. Servitization of trade refers to the increasing share of service traded in the current global economy. This trend, as a result of globalization, can impose serious threats on countries which fail to catch up on the domestic servitization and to export services, while the developed economies are exposed to larger market and export services which have higher margin than most manufactured or agricultural goods.

Servitization and development

As mentioned above, the trend of servitization comes with a redistrbutional effect regionally and globally. One can argue that the developed countries are developed because they underwent the process of servitization earlier than others, or the other way round. Despite the unclear causal direction, servitization is an important feature of modern developed economies.

Literature Review

Definition and Features

The term "servitization" is conventionally defined as the phenomenon of rising share of the service sector in economic activities. It is synonymous with "deindustrialization".

Key features of servitization include:

- Pay-for-use: client doesn't own the actual product but the service provided
- performance-based pricing: client pays for the capabilities a product performs, not the product itself

Such a business model very often takes the form of subscription-based long-term contracts (2 to 5 years), but not necessarily. The service is also often packaged as a solution, detailed in the contract. Client pays upon satisfactory performance of the service, not upon the delivery of product.

"Servitization of trade" refers to the growing share of services traded internationally, compared with goods traded. More often, servitization of trade actually means servitization of export.

Benefits of Servitization

Given the features described in the first section, servitization benefits client, producer (service provider), and an economy in different ways.

For Client:

- Reduced risk: payment is dependent on performance
- Smoother cash flows: no one-time payment
- Flexibility in service design: service can be designed to fit specific needs
- Reduced costs: manufacturers are committed to cost reduction

For Business:

- Innovation: long-term contract encourages the investment in innovation
- Stable revenue stream through subscription-based payment
- Lower costs for client acquisition
- Lower substitutability due to unique product design and therefore higher customer loyalty

For Economy:

- Long-term economic growth: due to the greater growth potential in service sector and the diminishing marginal profit in manufacturing
- Higher income: due to high skill-intensity in service sector
- Sustainability: by outsourcing pollution-intensive industries

Country Case Study

This phenomenon has been observed in almost all developed countries, indicating a shift from manufacturing to service sector, followed by a decline in the output share of manufacturing. The causation is still debatable, but major explanations for such development include: unbalanced growth of the two sectors, different income elasticity for goods and services, and the outsourcing trend in production.

In the EU, Germany and France are among the countries with the strongest servitization trend, with the manufacturing sector integrating (note: not shifting!) a greater component of service provision. These two countries have also been exporting more services along with goods, benefiting largely from the "servitization of trade". This trend is largely driven by the following (financial) benefits, whereas other countries who failed to catch up on the servitization trend, could not enjoy the added value of the service sector.

- Germany

Using micro data from Germany, Boddin and Henze found that service occupations in manufacturing had grown around 30% between 1975 and 2010 while production occupations in manufacturing declined over 10%. With

- France

According to Crozet and Milet's findings, the share of manufacturing in GDP dropped around 10% in most OECD countries between 1970 and 2010 while the share of the service sector continues to rise, indicating a shift in sectoral distribution in major developed economies. Besides the shift in macro economy and looking at a firm-level, 83% of French manufacturers also provide services as part of their business. That is to say, the border between manufacturing and service providers is becoming elusive and the share of service has grown both within firms and in the French economy as a whole. Servitization is used to refer to both trends.

The reason and main drives behind servitization is still being debated, but the authors proposed three hypotheses: 1) unbalanced growth, 2) income elasticity of demand and 3) outsourcing strategy in business operations. Most likely the three drives influenced the economy interdependently

- Sweden

Employment in manufacturing in Sweden dropped from 19.4% to 13.8% between 1991 and 2006 as wages rose. Lodafalk verified the servitization trend in the Swedish industry and further pointed out that measuring servitization using firm-level data may be underestimating the actual phenomenon since many firms placed their servitization activities under subsidiary firms, which are, statistically categorized as in the service sector. In brief, not only did the scale (in terms of value creation and employment) of the service sector grow, but there is also an increasing trend of larger manufacturers vertically integrating services into their business operations.

Key takeaways include: the rapid servitization of the manufacturing sector and lower-than-expected decline in manufacturing. Manufacturing sectors have increased their in-house service provision (insourcing), rather than merely outsourcing.

Manufacturers in Sweden focused their services in industrialized countries rather than developing countries. Also deployment of more non-personal services was also found – due to cost concerns. The author concluded 2 major reasons behind expansion of servitization: growing investment abroad, and to prolong the life-time relationship with clients (through subscription, service contracts etc.)

Lastly, service as input in the manufacturing process also increased, both in quantity and costs, which is likely to be linked to the increasing employment of professionals performing certain services.

The Swedish National Board of Trade further examined the relationship between servitization and trade and found that servitization can promote trade, but its effect in global context is still hard to determine. The board also suggested that the current measurement of trade may be underestimating the actual impact of servitization in terms of value creation.

The board distinguishes between 2 types of servitization: increasing service inputs in the production process and increasing share of service as output. For instance, vehicles and food are the 2 major industries with substantial input of services in the production process, with 24% and 20% respectively.

The global value chain concept provides two strong explanations for the growing servitization. As business operations globalized, more services are demanded to coordinate the more complex and diversified operations. Countries or companies standing at the relatively lower level of the chain also strive for upgrading, which often demands service inputs, or investing in R&D.

The board concluded that servitization has several implications for trade authorities:

1) To bridge the gap between manufacturing and service providers
2) To adapt negotiations for goods and services

- New Zealand: digital trade

Digital trade by its loose definition refers to all trades ordered online. Some of which are also delivered online as services. New Zealand Institute of Economic Research (NZIER) concluded five gains of digital trade, or a digitalized trade system: productivity, connectivity, predictive (through the digitally generated trade data), visibility and transparency, and inclusiveness (by uplifting trade barriers).

NZIER addresses two aspects of the digital system, namely the digital infrastructure and a legal framework, enabling digital trade in practice and in legal terms. For instance, the Digital Economy Partnership Agreement (DEPA), signed by Singapore, New Zealand, and Chile, is one of the earliest international digital architectures, with South Korea, Canada, as well as China, all expressing interest in joining.

Analytical Framework

Servitization can be measured at different levels:

* Inter-firm: usually country-level data, measuring how an economy is shifting from manufacturing to service.
* Intra-firm: usually measured with revenue, measuring the revenue ratio of service/manufacturing

Servitization can also be measured with the following two terms:

* Value-added: the margin (extra revenue) generated by service provision.
* Number of employment: more suitable for inter-firm measurement

Higher servitization usually indicates lower capital intensity, smaller firm numbers, higher productivity and higher skill-intensity, due to the growing number of digital-service companies, more specifically "digital servitization".

Global Value Chain

NZIER model of gains in digital trade

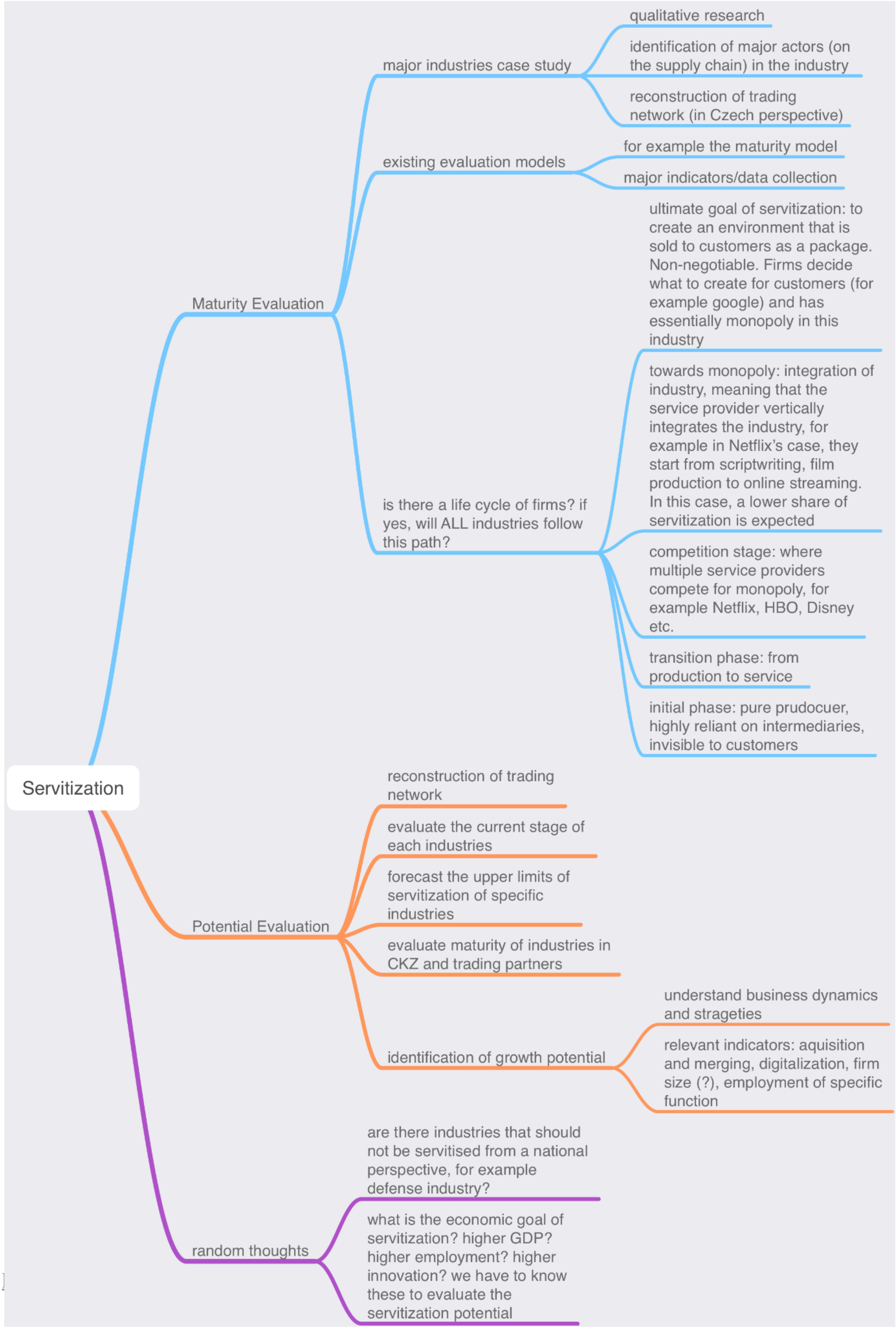
Framework to analyze business operations

	At home	abroad
Vertical integration	insourcing	Off-shore outsourcing
Vertical specialization	outsourcing	Off-shore outsourcing

* Service as final product to customers vs. service as input factors to ensure more efficient production

* **Main Idea**: final outcome should be a sector-based evaluation of servitization potential, with strategy proposals/suggestions
* **Challenges**
    * **Dynamic**: a static evaluation is pretty useless given the dynamic nature of the issue. To capture the dynamics, however, will include forecasts or at least modelling of social, political and other aspects. In the best case, we could have a rolling evaluation of the potential.
    * **Comparative**: servitization is usually evaluated in a relative term, meaning the share. That is to say, even if the absolute number increases, one country can still be lagging behind in the servitization trade. Also, if we focus on servitization of trade, the servitization of trading partners is then important for Czech republic (here is where indirect trade is relevant). We should also include the servitization maturity/potential of other trading partners (mostly Germany) as one of an indicator for Czech's potential

- **Qualitative**: the percentage of servitization or other major indicators such as digitalization itself is not the best indicator of the potential, we need to understand *each* industry qualitatively, for example what are the niche markets, who are the leading firms, why are they launching the new products/user system, to properly understand how servitization of a specific industry works and therefore evaluate how the servitization potential of this industry in Czech republic is.



Servitization
Maturity Evaluation
major industries case study
qualitative research
identification of major actors (on the supply chain) in the industry
reconstruction of trading network (in Czech perspective)
existing evaluation models
for example the maturity model
major indicators/data collection
is there a life cycle of firms? if yes, will ALL industries follow this path?
ultimate goal of servitization: to create an environment that is sold to customers as a package. Non-negotiable. Firms decide what to create for customers (for example google) and has essentially monopoly in this industry
towards monopoly: integration of industry, meaning that the service provider vertically integrates the industry, for example in Netflix's case, they start from scriptwriting, film production to online streaming. In this case, a lower share of servitization is expected
competition stage: where multiple service providers compete for monopoly, for example Netflix, HBO, Disney etc.
transition phase: from production to service
initial phase: pure prudocuer, highly reliant on intermediaries, invisible to customers
Potential Evaluation
reconstruction of trading network
evaluate the current stage of each industries
forecast the upper limits of servitization of specific industries
evaluate maturity of industries in CKZ and trading partners
identification of growth potential
understand business dynamics and strageties
relevant indicators: aquisition and merging, digitalization, firm size (?), employment of specific function
random thoughts
are there industries that should not be servitised from a national perspective, for example defense industry?
what is the economic goal of servitization? higher GDP? higher employment? higher innovation? we have to know these to evaluate the servitization potential

This paper was produced by the conceptual research team of the Global Arena Research Institute (GARI) as part of the preparatory work for utilizing GARI's signature digital twin of the globalized environment. Supported by the International Visegrad Fund, Technology Agency of Czech Republic (TACR) and the Konrad Adenauer Stiftung, GARI is at the forefront of integrating leading-edge computing technologies with socio-economic and political analysis. These internal conceptual working papers lay the foundation for our digital twin's application, offering critical insights and frameworks that enhance our understanding and foresight into global and local processes across various domains, including economy, trade, politics, defense, society, energy, and the environment.