Discussion Papers

Risk Assessment of Slovenian Companies and Banks Exposed to the German Automotive Industry

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August 2025

BANKA SLOVENIJE

EVROSISTEM

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Abstract

Recently, there have been many pessimistic discussions about the slowdown in the German automotive industry. Slovenian companies are significant partners in these supply chains, as can be determined from input–output tables, so there are real risks involved if those risks materialize. It is worth noting that the purpose of the analysis, in which we identify companies at risk due to their exposure to the German automotive industry, is not to assess whether the German automotive industry is in crisis, but rather to evaluate how such a crisis would impact Slovenian companies and banks. There is, in fact, an ongoing debate about the robustness of the German automotive industry.[1] In this paper, we identify companies that may encounter difficulties ("companies at risk"), as those operating within the automotive industry according to our data sources and methodology. Our identification procedure further requires that these companies have a share of at least 10% of their total operating revenues from trade receivables to Germany. We limit the scope of our analysis solely to manufacturing companies that have some performing exposure at Slovenian commercial banks (are performing bank borrowers). Let us emphasize that not all identified companies will eventually have solvency/liquidity issues. We can only speculate that they may have some difficulties and may need to rethink their business models or adjust their manufacturing mix.

Companies under that definition represent 6.6% of bank exposures to companies, 2% of bank total exposures, 5.3% of added value of all companies, 5% of operating revenues of all companies and 5.4% of all employees. We further assess the risks of individual Slovenian banks and of municipalities that are exposed to those companies. No bank has a share of exposures to companies at risk exceeding 10% of total exposure to companies. Looking at the municipality level, we identify some clusters with larger shares of industrial facilities or operating revenues at risk. We find that the two most exposed industries are manufacturing of motor vehicles and trailers and manufacturing of basic metals. Given the somewhat arbitrary nature of the identification process, we also conduct several robustness analyses. Particularly crucial is the analysis concerning the threshold for the share of trade receivables in total operating revenues, because identification is very dependent on this threshold.

By utilizing input–output tables, we identify potential spillover effects along the supply chains. Spillovers may also occur through associated entities. Additionally, we look at recent trends in default rates and trade receivables among these companies and conclude that by the end of 2024 the risks had not yet materialized, although there was some downturn in trade receivables at the end of the year, which stabilized in the first two months of 2025.

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[1] Positive article: Parikh, T. (2025). Germany's weak economy has strong foundations. *Financial Times*. Link: https://www.ft.com/content/f9298742-4fe5-43e7-9d0d-640fb530182e?accessToken=zwAGL5a73eAAkdP5KYdCT-VD59OdDWQPtTAYLg.MEQCICRpfnd4lYI-FVcDGZn5YNDoaVJfO7BHgYyn7FEoJ18oAiBy2WQCqXm-vGfvE1sqSqUdm98FWnQvQg6j-H56LV8I8gw&sharetype=gift&token=5934a9aa-4c98-4160-b199-0315cc829a9a

Negative article: Flaccadoro, M. (2025). The recent weakness in the German manufacturing sector. CEPR. Link: https://cepr.org/voxeu/columns/recent-weakness-german-manufacturing-sector

1 Introduction

The automotive industry is a structurally significant segment of the EU economy. According to ACEA (2023), it serves as a major employer that directly and indirectly provides jobs for approximately 13 million Europeans, which accounts for about 7% of total employment in the EU. Approximately 3.4 million jobs are situated within the automotive industry. The industry is a crucial source of demand for raw materials in industries such as metals, chemicals, plastics and textiles, while also generating demand for ICT services, repairs and mobility (European Commission, 2024).

While the economic significance of the automotive industry varies considerably across regions and EU Member States, Slovenia stands out as a nation heavily reliant on this industry. As noted by Slovenia Business (2023), not a single car produced in Europe is produced without at least one component being manufactured in Slovenia, underscoring the automotive industry's role as a primary driver of the country's economy. It contributes approximately 10% to Slovenia's GDP and constitutes around 20% of Slovenian exports.

A European Commission report (2024) states that the European automotive industry, particularly in Germany, is currently undergoing its most significant structural transformation in the past century and has faced a troubling situation in recent years. This transformation is primarily driven by a decline in competitiveness, relentless technological competition, rising costs and geopolitical tensions. Since reaching its peak in early 2018, the euro area automotive industry has encountered challenges, with noticeable declines in production and exports that remain below pre-COVID-19 levels. Production and export volumes have struggled to recover and lag behind those of international competitors such as China, Japan, the United States and Korea, with China gradually emerging as a significant exporter to the euro area. As of early 2024, average yearly production in the euro area had dropped by 20% compared to the average production levels of 2017. This downturn has been exacerbated by a decrease in sales of combustion engine vehicles, which has only been partially offset by increasing demand for hybrid and electric vehicles. Despite being one of the world's largest auto manufacturers, Europe has yet to regain its competitive edge in electric vehicle (EV) production (ECB, 2024; Wingender, P., et al., 2024).

The ECB (2024) further clarifies that demand for motor vehicles has been further dampened by price increases stemming from supply chain disruptions, elevated energy costs and stringent financing conditions. In the medium term, a recovery in euro area car production is anticipated to be driven by consumer demand; however, significant risks loom on the horizon. Heavy reliance of euro area car manufacturers on suppliers concentrated in a limited number of locations, such as for semiconductors and batteries produced in a few Asian countries, poses considerable risks to the supply chain, particularly during periods of heightened geopolitical tension. Industrial policies related to the green transition, such as the development of charging infrastructure, will also play a pivotal role in determining the future outlook for the euro area automotive industry.

Nevertheless, there exist more positive views. For instance, Transport & Environment (2024) argue that the current stagnation in EV production growth and sales in the EU and Germany does not signify an industry-wide crisis, but rather represents a transitional phase as manufacturers adjust to new regulations and evolving market dynamics.

If we now turn our focus to Slovenia, we must first recognize that Germany is Slovenia's most significant export market, with 33% of Slovenia's automotive exports directed to Germany (Slovenia Business, 2023). Consequently, changes in the German economic landscape may have a considerable impact on the Slovenian economy, particularly for companies that rely heavily on business with Germany for a substantial portion of their overall revenues. The saying "if Germany sneezes, Slovenian companies catch the flu" underscores the understanding of how exposed Slovenian companies are to challenges within the German automotive industry. Due to the export-driven nature of Slovenian companies, the primary risk faced by those in the automotive industry is a decrease in demand resulting from supply chain disruptions and reduced orders. Additionally, structural changes within the industry and the transition to EVs present further risks. As noted by Elasto Proxy (2022), the production of EVs requires fewer components compared to internal combustion engine (ICE) vehicles, which could render many components manufactured in Slovenia redundant.

The potential negative impact of disruptions in the German automotive industry could lead to a decline in Slovenian GDP, job losses and an increase in anticipated bank losses. Deutsche Bundesbank (2009) also cautions that a disruption in the automotive industry could lead to significant expected losses for banks. Deutsche Bundesbank (2009) emphasizes that even if the direct impact might be minimal due to the relatively low proportion of loans to automotive companies, the spillover effects through the supply chain could substantially increase these losses. Given the automotive industry's important role in Slovenia's economy, any disruptions are likely to have severe repercussions across other business sectors. We will explore this using input–output tables relevant to Slovenia.

This analysis addresses several critical objectives related to the impact of disruptions in the German automotive industry on the Slovenian economy. The analysis aims not to assess whether the German automotive industry is in crisis, but to evaluate how Slovenian companies and banks would be affected if such a crisis were to occur. We identify industries and companies within these industries at risk. We also quantify the contributions of companies at risk to the Slovenian economy by assessing their share of revenues, number of employees and added value, as well as their exposure within the Slovenian banking system. To assess the resilience of individual companies at risk, we utilize historical accounting data to evaluate their financial health and performance. We also show whether these companies have begun to experience rising default rates or lowering trade receivables to see if the risks have already started to materialize. We further assess the risks of individual Slovenian banks that are exposed to those companies. We present a breakdown of the companies at risk by industry and analyse what proportions of individual industries are at risk. Dnevnik (2024), for instance, notes that the companies that are most affected by the current disruption are those that produce vehicle components, such as metal parts, plastic parts and parts made of fabric for vehicle upholstery.

Next, we perform some regional risk assessment, which helps us to estimate the impact of potential shocks for the municipalities. Given the somewhat arbitrary nature of the identification process, we also perform robustness analyses to test certain assumptions and limitations. In the end we again utilize industry level input–output tables and check for upstream and downstream spillover effects.

In the next chapter we describe the datasets that we use in this analysis. We also describe the topics of individual chapters in more detail.

2   Data and overview

1. First, we present databases and other data sources used, chapter by chapter. At the same time, we provide an overview of each chapter.

2. In Chapter 3, "*Identification of industries at risk with input–output tables*", we identify industries in Slovenia that are exposed to the German automotive industry in terms of their output. We use industry-by-industry input–output tables by Eurostat (Eurostat, 2022).
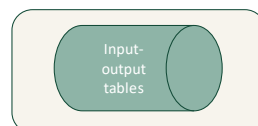
3. For the other parts of analysis, we identify companies that are at risk due to their dependence on the German automotive industry. The identification methodology is presented in Chapter 4, "*Identification of companies at risk*". We mostly rely on the SloExport database of Slovenian exporters (SloExport, 2024)[2] and combine it with information on company websites and media articles. We also use the register of business persons to identify industries.
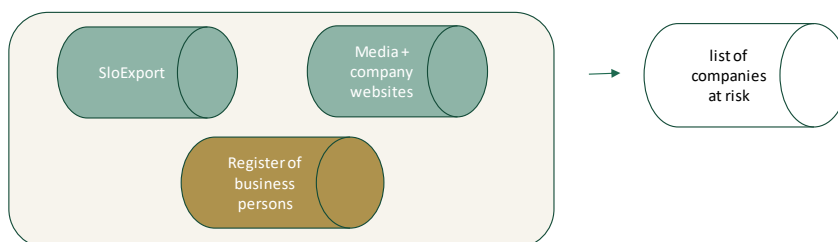
4. Chapter 5, "*Risk assessment of the economy and the banking system*", represents the main part of the analysis. Here we address the possible impact of a German automotive crisis on the Slovenian economy and on the banking system. We perform a credit risk assessment for identified companies at risk in terms of financial ratios and credit risk parameters. We combine many different data sources. The core database is the historical credit register (reporting of commercial banks to Banka Slovenije) and its newer version (monetary financial institutions reporting, PORFI).[3] We also use the register of business persons, company accounting data by AJPES (2023) and a database on trade receivables (KRD).[4]

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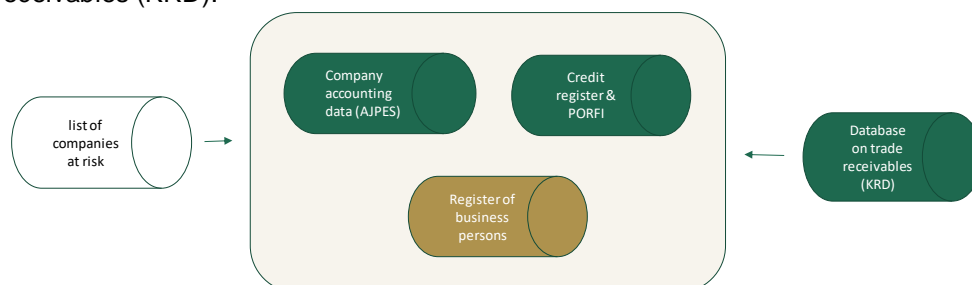
[2] The database snapshot was made on 19 December 2024.

[3] Source: https://www.bsi.si/porocanje/porocanje-banki-slovenije/porocila/porocanje-monetarnih-financnih-institucij

[4] Based on reporting to Banka Slovenije (Report on trade accounts receivable/payable and financial investments/liabilities vis-à-vis non-residents). Retrieved from https://www.bsi.si/porocanje/porocanje-banki-slovenije/porocila/porocilo-o-poslov-nih-terjatvahobveznostih-in-financnih-nalozbahobveznostih-do-nerezidentov-krd

5. In Chapter 6, "*Risk assessment of individual banks*", we continue our analysis from the previous chapter. We redirect our focus towards analysing exposures of individual banks to the companies at risk. As the analysis is similar as in the previous chapter, the data sources are the same.

6. In Chapter 7, "*Risk assessment of municipalities*", we focus on municipalities. We are interested in which municipalities are more exposed to companies at risk in terms of operating revenues and in terms of the number of industrial buildings at risk. We add additional databases from monetary financial institutions reporting (PORFI) that contains cadastral and collateral data. We use also ChatGPT (OpenAI) and Google Maps for the identification of the industrial buildings locations of the largest companies.
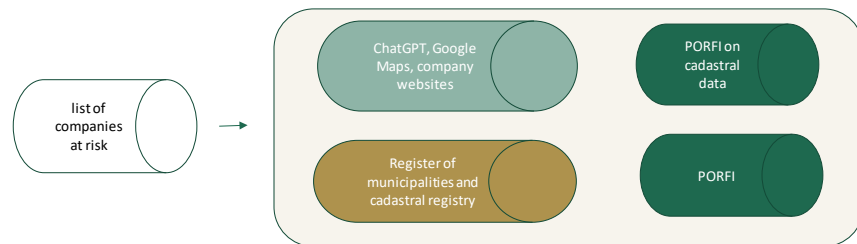
7. In Chapter 8, "*Robustness checks*", we provide some robustness checks of our results from Chapter 5, "*Risk assessment of the economy and the banking system*". We also provide a broader overview of the problem at hand. The robustness checks are made by changing assumptions *ceteris paribus*. For instance, in the main part we analyse only performing manufacturing companies that are more than 10% exposed to Germany in terms of share of trade receivables in operating revenue. In this chapter we relax different assumptions, for instance percentage threshold, we check risks at other industries, we relax the dependence on Germany and allow for other countries as well, etc. We finally discuss the limitation of our analysis, where we might be too conservative and what we might have missed.

8. In the last chapter, "9 *Spillover effects*", we again use Eurostat input–output tables. We also check company websites to address possible spillovers from our companies at risk onto associated entities or via supply chains.

3   Identification of industries at risk with input–output tables

In the first part, we check the importance of Germany and its automotive industry to Slovenia. We use data from FIGARO industry-by-industry input–output tables from the Eurostat database. The latest data available at the time of writing this paper is for 2022.

First, we decompose Slovenian output by country to identify the primary users. As shown in Figure 1, Germany is the second most significant foreign consumer of Slovenian output (3.7%).

Figure 1: **Percentage share of Slovenian output per country**
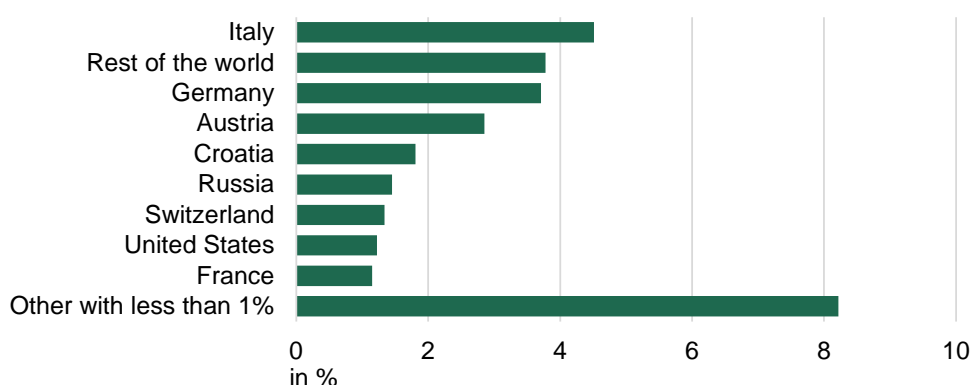
Sources: Eurostat, own calculations.
Notes: Figures for gross fixed capital formation and changes in inventories and acquisition less disposals of valuables are excluded. We include also Slovenian output to the Slovenian economy. Slovenian output that is used by Slovenian companies represents 69% of total output (not shown in the figure). This means that we include output to economies, households and governments of different countries. Rest of the world are other countries as defined by Eurostat FIGARO tables (2022).

In Figure 2, we further refine our analysis by focusing on Slovenian output used by the global automotive industry (*C29 – Manufacture of motor vehicles, trailers and semi-trailers*). Here, Germany's importance as a business partner becomes even more pronounced, with a substantial share of 20.4% among all automotive business partners of Slovenia.

Figure 2: **Percentage share of Slovenian output to automotive industry by country**
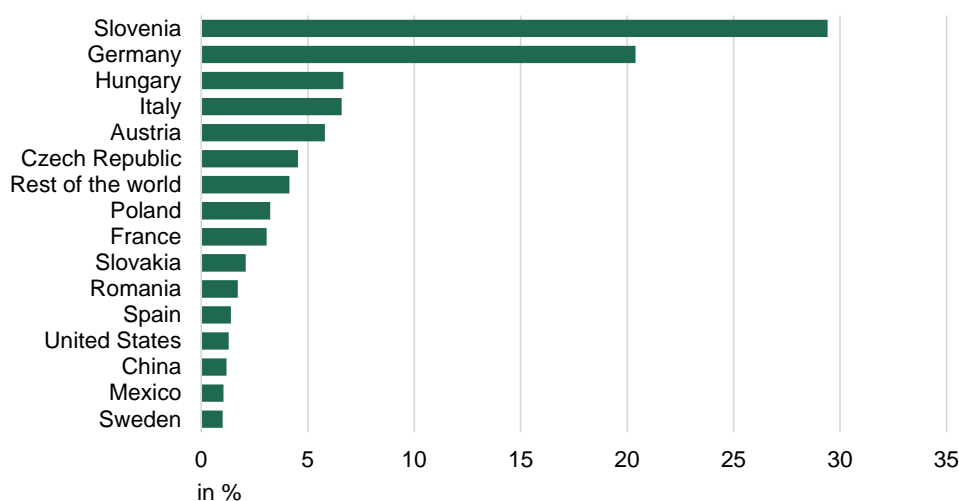
Sources: Eurostat, own calculations.
Notes: Figures for gross fixed capital formation and changes in inventories and acquisition less disposals of valuables are excluded. Here we include only Slovenian output to industry C29 (*Manufacture of motor vehicles, trailers and semi-trailers*) of different countries, including Slovenia. Countries with a percentage share of less than 1% are excluded on the figure. Rest of the world are other countries as defined by Eurostat FIGARO tables (2022).

In the event of a sudden disruption in the German automotive industry, we can further identify industries in Slovenia that will face a lack of demand for their products. In Figure 3, we identify the seven industries at risk whose output is most sensitive to the German automotive industry. We identify industries as at risk if the share of their total output that goes to the German automotive industry is greater than 1%.[5] We see that the most exposed industries to such risk in Slovenia are:

- *C29 – Manufacture of motor vehicles, trailers and semi-trailers* and
- *C28 – Manufacture of machinery and equipment n.e.c.*

Many other manufacturing industries are also at risk, for instance:

- *C22 – Manufacture of rubber and plastic products*,
- *C24 – Manufacture of basic metals*,
- *C27 – Manufacture of electrical equipment,*
- *C25 – Manufacture of fabricated metal products, except machinery and equipment*,
- *C23 – Manufacture of other non-metallic mineral products*.

We also tested whether our results change using a different criterion: instead of verifying that more than 1% of an individual industry's total output goes to the German automotive industry, we checked if more than 1% of the individual industry's total foreign output goes to the German automotive industry. The identified industries remain the same, with the addition of:

- *C33 – Repair and installation of machinery and equipment,*
- *G45 – Wholesale and retail trade and repair of motor vehicles and motorcycles*,
- *H49 – Land transport and transport via pipelines*.

Figure 3: **Potentially vulnerable industries**
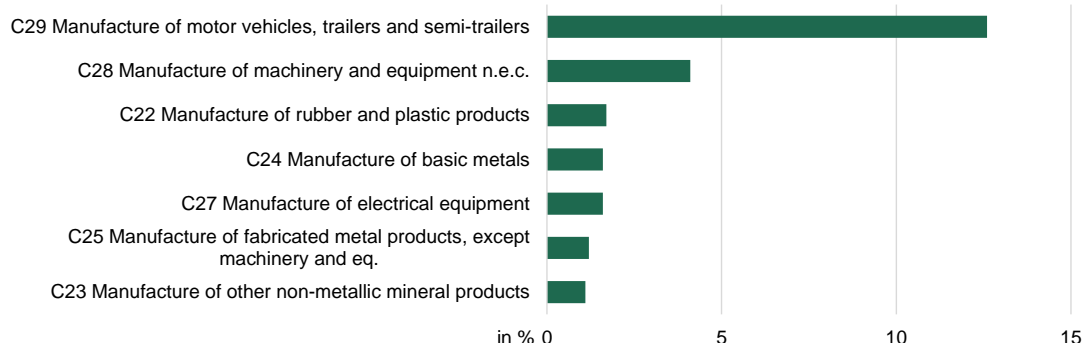
Sources: Eurostat, own calculations.
Notes: We include output to economies, households and governments of different countries. Input–output relations of industry with itself are excluded. Gross fixed capital formation and changes in inventories and acquisition less disposals of valuables are excluded.

Identification of a whole industry is very approximate. Not all companies within some industries will actually be at risk, as can be seen from the low percentages that we have used for identification in the figure above. But it may be the case that some companies are very vulnerable as they have very great dependence. This means that we need to go deeper and identify individual companies at risk.

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[5] The 1% threshold is based on expert judgement (in order to provide a meaningful figure).

4   Identification of companies at risk

To identify potential companies at risk due to disruptions in the German automotive industry, we perform the following steps.

Initially, we utilize the SloExport database to pinpoint companies within the automotive industry. This is a database of Slovenian exporters that is updated on a voluntary basis by the companies themselves. In Appendix 12.3, we assess the dataset's coverage and determine that it is a reliable and valuable resource for our needs. The SloExport database contains information about the industries in which a company operates. Initially, we include companies that explicitly identify as part of the automotive industry. Additionally, we expand the selection based on the Classification of Products by Activity (CPA), which is also available in the SloExport database. We include only CPAs that are most plausibly linked to the automotive industry. For example, we incorporate all CPAs beginning with code 29 (*Motor vehicles, trailers and semi-trailers*) as well as other codes clearly related to the automotive industry, such as internal combustion engines, tire cord fabric, vehicle clocks, etc.[6] Lastly, SloExport provides the textual description of the company operations. We include companies whose description involves different variations of words "automobile" and "industry".[7,8]

In the second step, we narrow the analysis to the manufacturing sector (C) and ensure that all companies classified under the NACE C29 industry code (*Manufacture of motor vehicles, trailers and semi-trailers*) are included. For further details on robustness checks, where we also examine companies outside the manufacturing industry, refer to Chapter 8, "*Robustness checks*".

In the third step, we collect media articles that discuss the risks in the Slovenian automotive industry. We ensure that all companies mentioned in those articles are included in our lists. Out of 37 company mentions, we find that only one company could not be identified using our methodology. After reviewing the company's annual reports, we manually add this company.

In the fourth step, we utilize data from the trade receivables database and restrict our analysis to companies where the annual increase in trade receivables constitutes more than 10% of their total operating revenues.[9] Please note that this threshold is arbitrary. We have adopted the 10% threshold in accordance with IFRS 8 (International Accounting Standards Board, 2021), which offers guidance on identifying operating segments that necessitate additional disclosure. To ensure the robustness of our analysis, we have conducted several tests to address this issue.

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[6] The list of included CPAs is in Appendix 12.1.

[7] In Slovenian we have "avtomob", "avtoind", "avto-ind", "avto-moto" and "avtomotiv".

[8] From the perspective of the share of each identification method in all performing companies at risk in the manufacturing sector (C) (we define this notion later in this chapter), it is worth mentioning that in the first step, using the SloExport definition of the automotive industry, we cover approximately 60% of operating revenue, 73% of exposures and 50% of companies. With the CPA list and the use of company descriptions on the SloExport website, we identify an additional 24% of operating revenues, 8% of exposure and 45% of companies. The remaining share is attributed to companies classified under C29, along with one additional company identified through a manual review of media coverage.

[9] Please be aware that the database on trade receivables has certain limitations. Not all companies are required to report to this database. We have conducted some coverage checks in Appendix 12.3, which indicates good coverage. This database focuses exclusively on trade receivables within sector S11. We assume that operating revenues can be approximated by summing the monthly increases in trade receivables. This assumption is fairly valid, based on the accounting definitions of trade receivables and operating revenues. However, the figures may not be identical, because we do not account for possible trade cancellations, audits and other discrepancies. Please see Chapter 8, "*Robustness checks*", where we discuss this further. It is important to note that the database on trade receivables and the AJPES company annual reports are two distinct data sets.

Given our central bank's focus on the banking system, we further restrict our list of companies at risk to companies that are not in default (i.e. are performing borrowers) in Slovenian commercial banks. In most chapters, default is defined as rating grades D or E, or being 90 days past due at the company level. We conservatively classify all exposures at different banks as default if more than 1% of exposures are in default. Only in Chapter 6, "*Risk assessment of individual banks*", do we use the EBA's definition of performing exposures and perform calculations at the bank level.

Those steps result in the list of "performing companies at risk". To summarize:

1) **Utilize SloExport database for first list of companies in automotive industry:**
    ○ include companies that report operating in the automotive industry,
    ○ include companies with CPAs related to the automobile construction,
    ○ include companies with textual descriptions containing automobile-related terms.
2) **Limit/add NACE industries:**
    ○ restrict the list to companies in manufacturing sector (C),
    ○ make sure that all companies from industry C29 (*Manufacture of motor vehicles, trailers and semi-trailers*) are included.
3) **Manual inclusion of companies:**
    ○ checking media mentions of companies in automotive industry-related articles and adding any potentially missing companies.

Those three steps conclude the list of "identified companies" operating in the automotive industry.

4) **Dependence on Germany:**
    ○ exclude companies whose trade receivables from Germany constitute less than 10% of their total operating revenues.
5) **Bank performing borrower:**
    ○ also restrict the list to companies that are performing borrowers (i.e. not in default and have some exposure) in Slovenian commercial banks.

All five steps combined results in the list of "performing companies at risk". The list consists of 77 companies.

We want to emphasize that the definition of risk is ambiguous. Our analysis does not imply that all the listed companies will default on their bank exposures or go bankrupt.[10] Rather, it indicates that these companies might face difficulties due to disruptions in the German automotive industry and will require some adjustment of their business models.

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[10] In a separate analysis, we calculated that the historical one-year exposure-weighted default rate was approximately 12% for companies whose operating revenue dropped YoY by more than 10%. That analysis focused only on one-year effects. In the calculation we used the database from 2000–2023, excluding the years 2013–2014, when there were major transfers of financial assets to the bad bank. We defined exposure as gross balance and off-balance sheet exposures. Default was defined by the rating grades D or E or being overdue for more than 90 days. To provide a more accurate figure for our analysis, the database for that analysis included only companies in sector S11 and the manufacturing sector (C).

5 Risk assessment of the economy and the banking system

In this and most of the following chapters we will be analysing the list of 77 "performing companies at risk" that we identified in Chapter 4, "*Identification of companies at risk*". These companies are related to the automotive industry and have more than 10% of their operating revenue coming from trade receivables from Germany. We have restricted the list to include only companies with performing exposures at the banks. In this chapter, we use a database where a default event is defined as being 90 days past due or having rating grades D or E. Default is conservatively defined at the company level.

In this analysis, we focus exclusively on companies in the manufacturing sector (C) and limit our scope to sector S11 (excluding sole proprietors). We primarily use data as of 31 December 2023, unless otherwise specified. Bank exposures and borrower data include all exposures defined as classified claims, which largely follow the definition of financial assets measured at amortized cost.[11] Unless otherwise stated, exposures are considered in gross terms on-balance and off-balance sheet.

This chapter begins by evaluating the broader economic and banking system implications of our findings. We then present an industry-level breakdown of the identified companies at risk. Further, we analyse some financial indicators of identified companies and look at whether these companies have begun to experience rising default rates or lowering trade receivables to see if the risks have already started to materialize.

5.1 Importance for the economy and the banking system

In terms of economic significance, in 2023 Slovenian companies from all industries had operating revenues of EUR 140.2 bn. As of 31 December 2023, their total exposure at Slovenian commercial banks amounted to EUR 16.6 bn.[12] In our analysis, we focus solely on companies in the manufacturing sector, which account for nearly one-third of all companies in terms of both revenue and exposure (EUR 40.6 bn in operating revenues and EUR 4.9 bn exposure). This is shown on the first bar in Figure 4.

In the analysis, we further focus only on performing bank borrowers. Figure 4 shows that, after limiting to performing borrowers, the decrease in exposure value is negligible, while the operating revenues decrease by approximately EUR 3 bn (which represents a 7% decrease).

When defining performing companies at risk, we also used the trade receivables database to identify companies with high dependence on the German market. Since not all companies report to that database, our sample is further reduced for more than EUR 6 bn of operating revenues and a little less than EUR 1 bn exposure. We can conclude that despite the decrease, our database still contains a large share of operating revenue (83%) and exposures (80%), ensuring adequate coverage. The coverage reduction is highest when looking at the number of companies, which decreases substantially.

From the remaining companies, we can then identify which are at risk by linking the list of *identified companies* we defined in Chapter 4, "*Identification of companies at risk*"

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[11] We exclude debt instruments with ISIN code. All banks are included except branches.
[12] Due to data limitations, this number does not include sole proprietors, which account for an additional EUR 0.5 bn.

(SloExport database, manual entries and industry C29). The operating revenue and exposure of those identified companies at risk is shown in the second-to-last column.

In the last column, we show the figures for the final list of performing companies at risk, whereby we also include the threshold of 10% trade receivables from Germany in their operating revenues. These performing companies at risk represent EUR 7.0 bn of operating revenue and EUR 1.1 bn of exposure. These are also the main results of the analysis, which we will refer to throughout this paper.

Figure 4: **Operating revenue, exposure and number of companies of analysed companies in manufacturing sector**
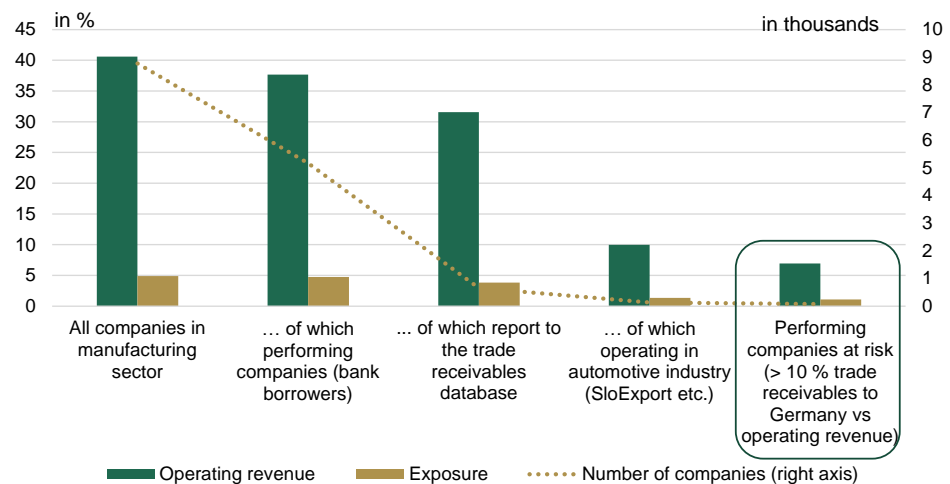
Sources: Bank of Slovenia, AJPES, SloExport, own calculations.

In Figure 5, we illustrate the share of the entire Slovenian economy (EUR 140.2 bn of operating revenues) represented by our performing companies at risk (EUR 7.0 bn of operating revenues, which is 5.0%). These companies account for 10% of foreign operating revenues, 27.6% of all trade receivables from Germany and 13.4% of all trade receivables. Smaller shares can be observed in total bank exposures (2%), bank exposures to companies (6.6%), operating revenues of all companies (5.0%), value added[13] (5.3%) and number of employees (5.4%). The number of performing companies at risk is very small compared to the total number of companies (0.1%). Based on the assumptions, the impact on operating revenue, exposure to companies, added value and number of employees appears to be manageable. However, it is important to note that this represents only the first-round effects, with potential supply chain spillovers, which are partially addressed in Chapter 9.

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[13] Value added is defined according to the AJPES definition as gross operating income - costs of goods, materials and services - other operating expenses.

Figure 5: **Importance of performing companies at risk for the total economy (left) and the manufacturing sector (C) (right)**
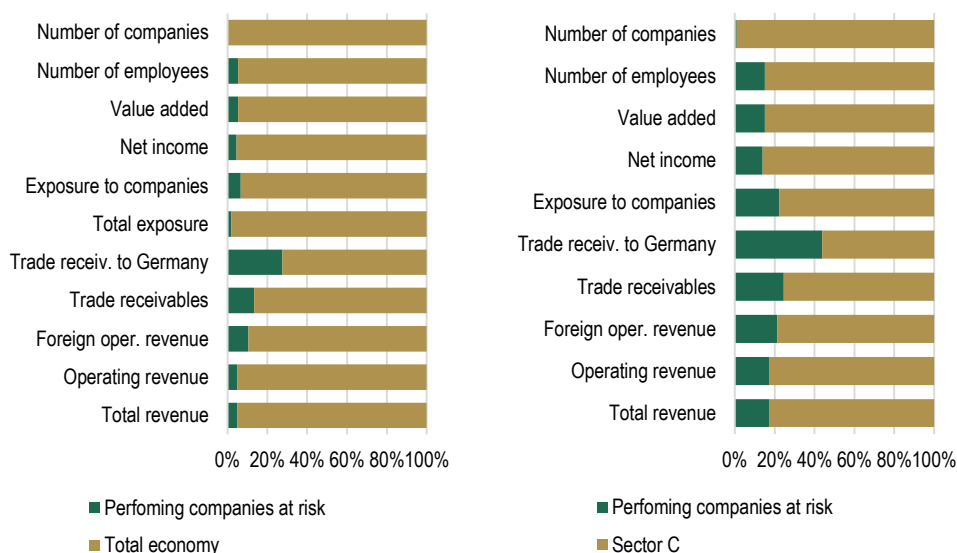
Sources: Bank of Slovenia, AJPES, SloExport, own calculations.

Notes: The total economy in this analysis represents all companies in Slovenia in sector S11. Please note that our analysis primarily focuses on the manufacturing sector. Companies in the wholesale sector are not extensively included, as they are more related to trade obligations rather than trade receivables within German industry. Due to data limitations, smaller companies might be missing in our analysis. However, we have tested and confirmed that the overall coverage remains high.

5.2 Decomposition by industries

In Figure 6, we show the industry decomposition of the operating revenues and exposures of our performing companies at risk.[14] We see that our identified companies do not come solely from industry C29. The four largest industries in terms of operating revenues and bank exposures are:

- *C29 – Manufacture of motor vehicles, trailers and semi-trailers*,
- *C24 – Manufacture of basic metals*,
- *C27 – Manufacture of electrical equipment*,
- *C25 – Manufacture of fabricated metal products, except machinery and equipment*.

Industries identified here and their contributions are more-or-less the same as in Chapter 3, "*Identification of industries at risk with input–output tables*", which confirms the validity of both approaches in identifying risky industries.

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[14] In Appendix 12.4, we show the industry decomposition by added value and number of employees.

Figure 6: **Industry decomposition of performing companies at risk, by operating revenue (left) and by exposure (right)**
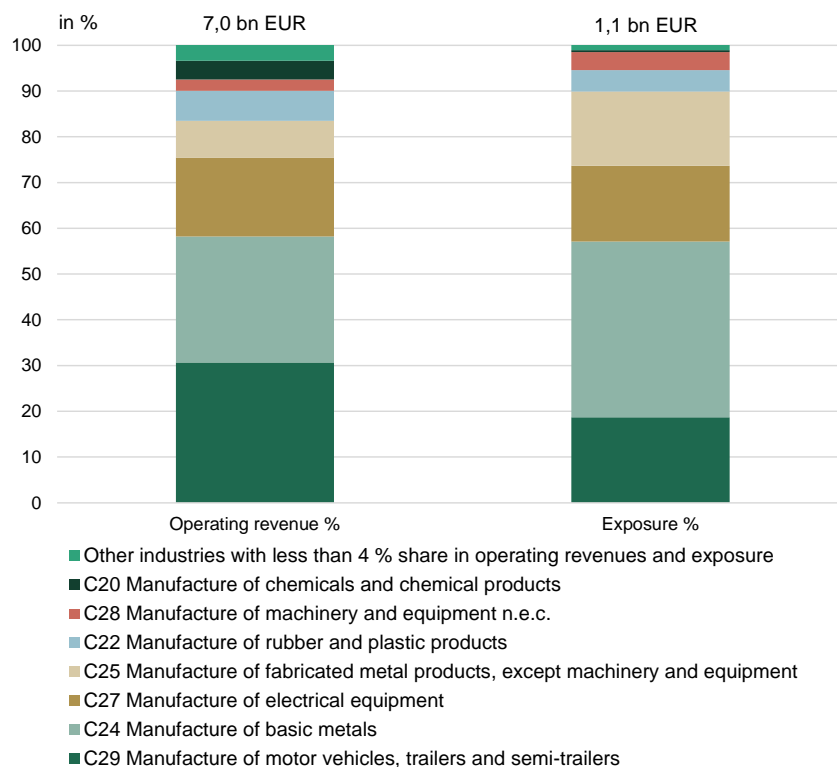
Sources: Bank of Slovenia, AJPES, SloExport, own calculations.

In Figure 7, we show the share of each industry represented by our performing companies at risk. In other manufacturing industries not shown in the figure, the share is 0%. We see that the largest shares (over 50%) by both criteria (operating revenue and exposures) are in the following industries:

- *C29 – Manufacture of motor vehicles, trailers and semi-trailers* and in
- *C24 – Manufacture of basic metals.*

Next are:

- *C27 – Manufacture of electrical equipment*,
- *C13 – Manufacture of textiles* and
- *C15 – Manufacture of leather and related products*.

In some industries, a large share in one category does not necessarily imply a large share in the other. For example, the share of C13 and C15 is large only in terms of operating revenues, while the share in terms of exposure is negligible.

Figure 7: **Share of performing companies at risk in total performing companies, by industry level**
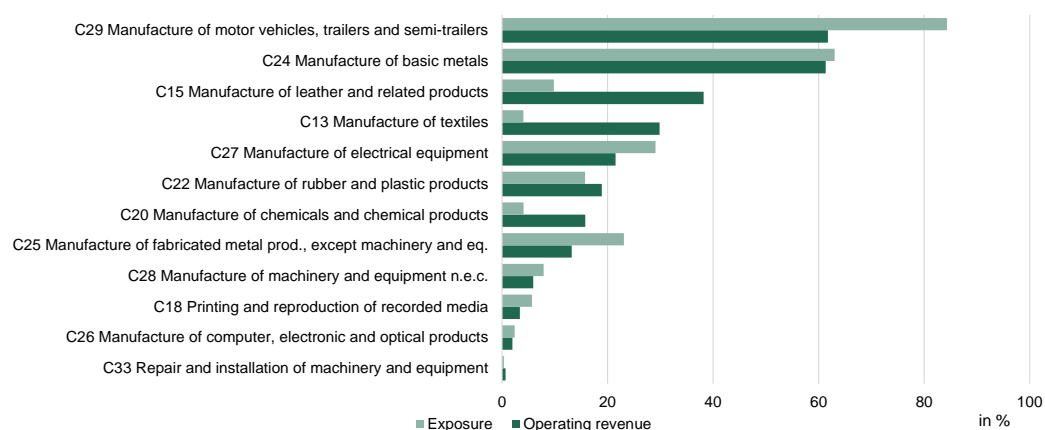
Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
Note: Industries within the manufacturing sector (C) that have a share of 0% are not shown in the figure.

5.3 Financial performance

Performing companies at risk have reduced their debt and increased liquidity since the great financial crisis. The right-hand figure below shows that liquidity has increased more unevenly in the recent period, as we see that the average value is higher than the median. Liquidity has increased more for companies in the upper 75th percentile than in the lower 25th percentile (interquartile range).

Figure 8: **Indebtedness and liquidity of performing companies at risk**
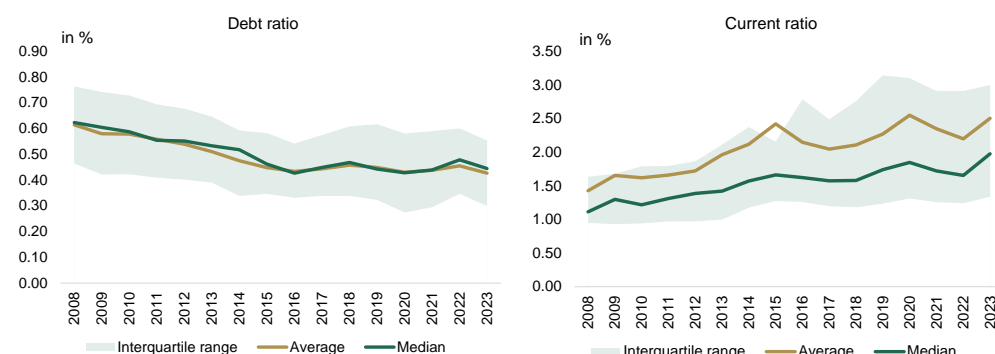
Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
Notes: To ensure consistency, we only include companies in the figure that have data available for the entire time series. Hence, instead of 77 companies, we include 68 companies. Debt ratio is calculated as total liabilities divided by total assets. In general, a lower debt ratio represents a more financially stable company with less risk. Current ratio is calculated as current assets divided by current liabilities. It measures the ability to repay short-term liabilities with short-term assets. At the time of writing this paper, the accounting data availability was up to December 2023.

The reduction of indebtedness and the increase in liquidity are also noticeable in the entire economy. First, we compare two industries: "*C29 – Manufacture of motor vehicles, trailers,and semi-trailers*" and "*C24 – Manufacture of basic metals*" with the entire economy.[15]

Figure 9 illustrates the historical trend of the ratio of specific figures (e.g. exposure, operating revenues, etc.) between the two mentioned industries and the entire economy. We see that the share of exposure has remained relatively stable over time. The movement of the share of operating revenues has been somewhat more volatile. It

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[15] We took these two industries as a basis because, in the previous chapter, we have shown that those two industries have the largest share of performing companies at risk among all companies.

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significantly declined during the great financial crisis, then rose again, but interestingly, it has been falling again in recent years.

We were also interested in whether this declining trend is present in all companies at risk or only in the mentioned industries. When comparing performing companies at risk with the entire economy, we need to be more cautious. We identified performing companies at risk as of 31 December 2023, which means that these companies have already survived the entire historical period. Therefore, a historical comparison would not be consistent with the entire system, where companies emerge and disappear. For this reason, in the right part of Figure 9, we adjust the data source so that we only include companies that we find in the database throughout the entire historical period. In this adjusted sample, we can again confirm that the operating revenues of performing companies at risk have been slightly declining in proportion to all companies in recent years. The trend is somewhat less pronounced than we previously observed.

Figure 9: **Shares of industries C29 and C24 (left) and of performing companies at risk (right) in the total economy for various economic indicators**
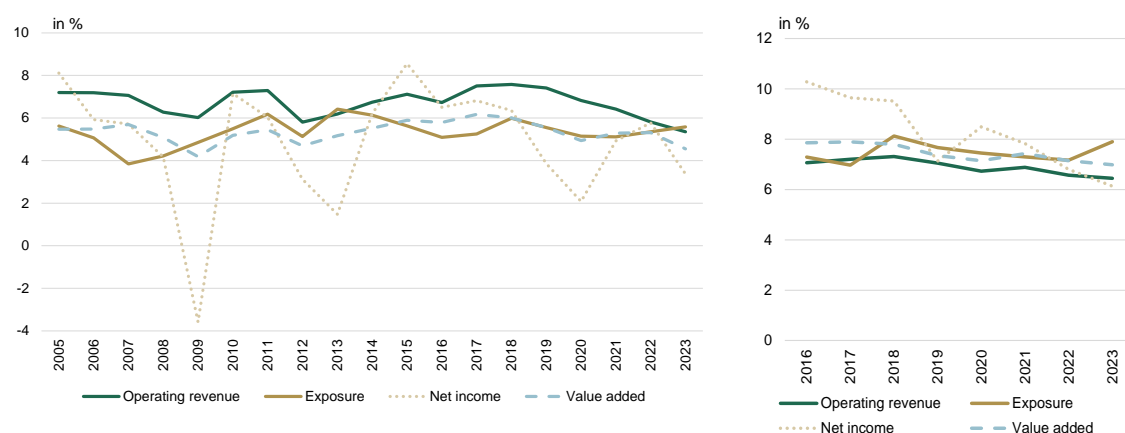
Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
Note: On the right-hand figure, we make sure that we include only the performing companies that are in the sample for all years (in terms of companies at risk, we reduce the sample by nine companies). Here we add an additional filter that the exposures are above EUR 1,000. At the time of writing this paper, the accounting data availability was up to December 2023.

5.4 Credit risk parameters

Almost the entire paper is based on data up to 31 December 2023, so the realization of risks is not yet observable. In this and the next sub-chapter, we additionally calculated the exposure-weighted default rates (DR) until the end of 2024.[16] We also separately present the DR series for the C24 and C29 industries, which have the largest shares among our identified companies.

In Figure 10, we show that the entire manufacturing sector is approximately as cyclical as the entire economy. Slightly more cyclical are industries C29 and C24, but it should be noted that greater volatility is expected as we move to the granular level of individual industries. An important conclusion is that risks have not yet materialized by the end of 2024, as default rates remain low.

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[16] Here, we also use the definition of default as 90 days past due or credit ratings of D or E at the company level.

Figure 10: **Exposure weighted company default rates (DR)**
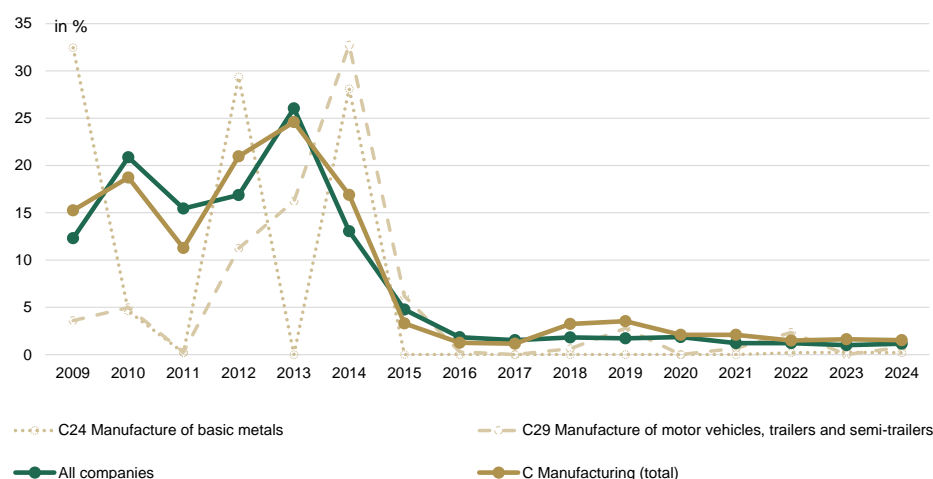
Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
Note: At the time of writing this paper, the quarterly default rate data availability was up to December 2024.

5.5 Trade receivables dynamics

No increased risks have been observed in default rates so far, so we checked further whether the reduction in sales to the German automotive industry is already noticeable. Figure 11 shows the trend of monthly increases in trade receivables from Germany for our performing companies at risk, compared to the trend in trade receivables from Germany for other companies in the manufacturing sector (C).

We observe that all companies experienced decline in the last months of 2024. However, there has been an improvement in the first two months of 2025. Also, a slight slowdown can be observed over the course of last two years. It is important to emphasize the significance of the manufacturing sector (C), as it contributed approximately 66% of the total increase in trade receivables from Germany in 2024, meaning that the contribution of other sectors is much smaller.

Figure 11: **Monthly increases of trade receivables to Germany**
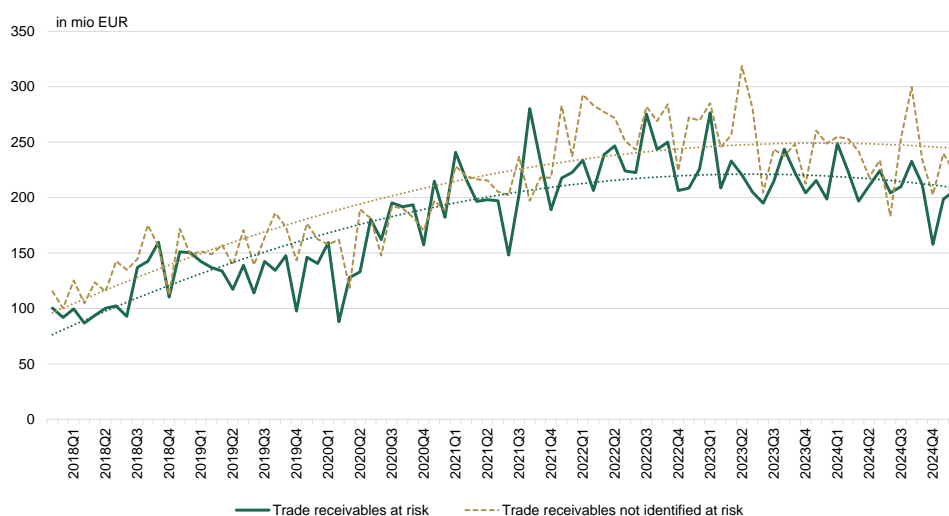
Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
Note: We display also polynomial interpolation. At the time of writing this paper, the data availability was up to February 2025.

6 Risk assessment of individual banks

In this chapter, we continue analysing "performing companies at risk" using the same definitions and databases as in the previous chapter. However, we now focus more on risk concentration in different banks. The only difference is that we now concentrate solely on data as of 31 December 2023, allowing us to use a new database with the EBA definition of default. We maintain the default definition at the company/bank level (this definition is used only in this chapter). Additionally, we discuss the differences between total exposures and on-balance sheet exposures.

6.1 Exposure to the banks

In Figure 12, we show the distribution of EUR 1.1 bn of bank exposure of performing companies at risk relative to the total bank exposure of all companies from sector S11 (EUR 16.6 bn). We can see that all banks have shares lower than 10%, and five banks have shares lower than 1%. Note that banks have also exposures to other segments. The distribution of bank exposure of performing companies at risk relative to the total bank exposure (including also exposure to other sectors besides S.11) is shown in Appendix 12.5.

Figure 12: **Share of exposures to companies at risk in total corporate exposures across banks**
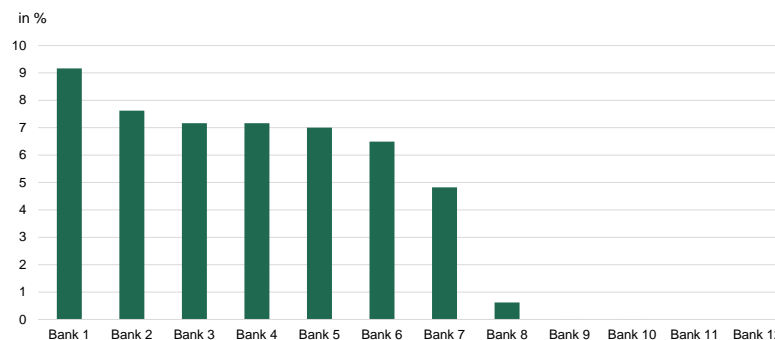
Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
Note: Exposures are defined as performing classified claims, gross on-balance and off-balance sheet.

The distribution is similar even if we analyse only the on-balance sheet exposure instead of the total exposure. Figure 13 shows the distribution of EUR 0.76 bn of on-balance sheet exposure of performing companies at risk to banks relative to the total performing on-balance sheet exposure of companies in sector S11 (EUR 9.62 bn). We can see that only one bank has a share slightly higher than 10% and five banks have shares lower than 1%.

Figure 13: **Share of on-balance sheet exposures to companies at risk in total corporate exposures across banks**

Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
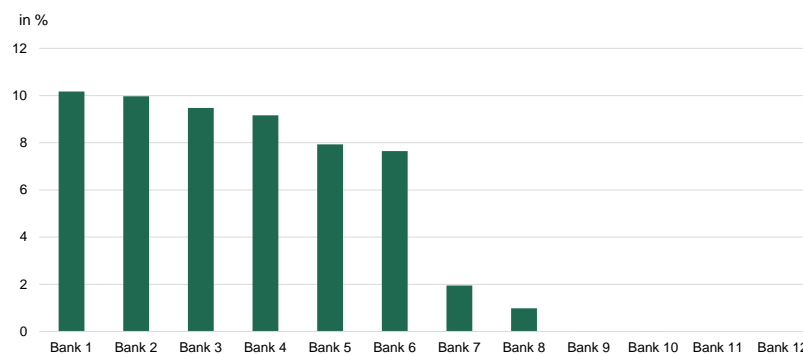Note: Exposures are defined as performing classified claims, gross on-balance sheet.

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Risk assessment of municipalities

In this chapter, we continue the analysis of "performing companies at risk" using the same definitions as in Chapter 5, "*Risk assessment of the economy and the banking system*", but now we focus on the risk concentration in different municipalities.

7.1 Operating revenues of companies at risk at the municipality level

In this chapter, we are interested in the operating revenues of performing companies at risk by municipality. In Figure 14, we show the share of operating revenues of performing companies at risk relative to the operating revenues of all companies based/headquartered in a municipality.[17] Additionally, Appendix 12.6 includes a map of Slovenia with the amounts (instead of shares). In this part of the analysis, we have only one data point for each company regarding its operating revenues for 2023, which we attribute to the municipality where the company is headquartered.

Figure 14: **Share of operating revenues of performing companies at risk in total, at municipality level**
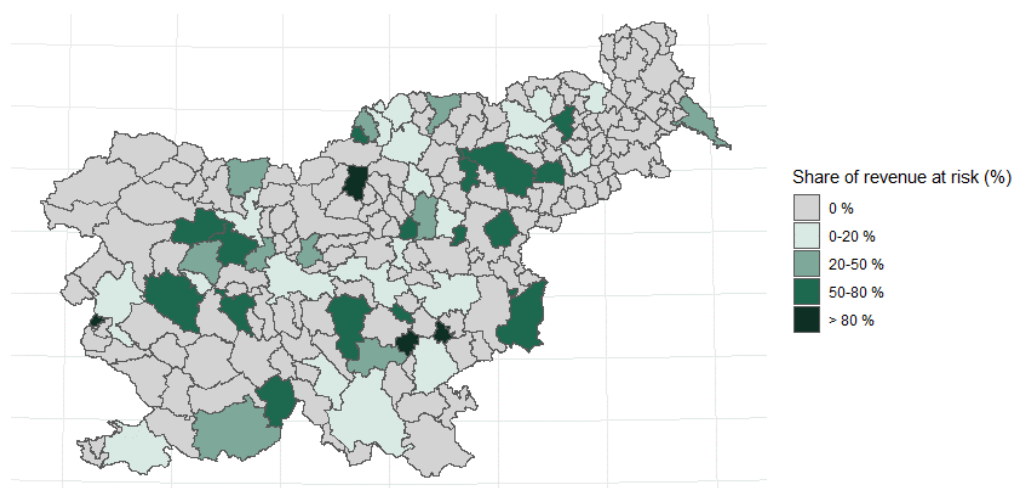
Sources: Bank of Slovenia, AJPES, SloExport, GURS, own calculations.

7.2 Number of industrial facilities of companies at risk at the municipality level

Next, we analyse the industrial facilities owned by companies by municipality. Industrial facilities are not necessarily located only in the municipality where the company is headquartered. In this second part, we create a database in which we have data on the locations of a company's industrial facilities/factories.

We obtain data on the locations of industrial facilities from two sources. First, based on monetary financial institutions' reporting on cadastral data, we obtain information on the cadastral municipalities[18] in which the company industrial facilities are located.[19] This information is only available if the company has a collateralized loan at the bank. An additional limitation is that this information is only available for new loans that were originated after April 2022.[20]

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[17] All the maps are based on the GURS database (https://ipi.eprostor.gov.si/jgp/data) and plotted with "sf" package in R.

[18] We map cadastral municipalities to regular municipalities according to an internal code list. In cases where a cadastral municipality is located in two or more municipalities, we use only the first entry and thereby a slight error might be made.

[19] We limit ourselves to so-called industrial facilities, excluding data on parcels, other business premises, etc.

[20] From EUR 4.9 bn of total exposure to companies in sector S11 in the manufacturing sector (C), we have EUR 1.8 bn of exposure that is a) secured by real estate and b) actually includes information about the cadastral municipality of the industrial property that is given as collateral.

Despite the limitations, this approach allows us to obtain some additional locations of industrial properties in various municipalities.[21] For all remaining companies, we use the data on the municipality of the company's headquarters from the same database as in the previous sub-chapter. For these companies, we still only have information on one location.

In the second step, we supplement the list of locations with a manual review of 37 companies in our database that had at least EUR 150 million in operating revenues in 2023. Using tools like ChatGPT (OpenAI), Google Maps and company websites, we add 34 additional locations of industrial facilities in various municipalities for those 37 companies.

It turns out that we can retain the headquarters of all these companies, as there is an industrial facility in every municipality where the company's headquarters is located. It also turns out that with a manual review, we can add significantly more municipalities than in the previous step using the monetary financial institutions' reporting on cadastral data. In the previous step, we identified only 6 out of the 34 additional municipalities that we identified now. Nevertheless, the process is useful, as a manual review of all companies is impossible.

Figure 15: **Share of number of industrial facilities of performing companies at risk in total, at municipality level**
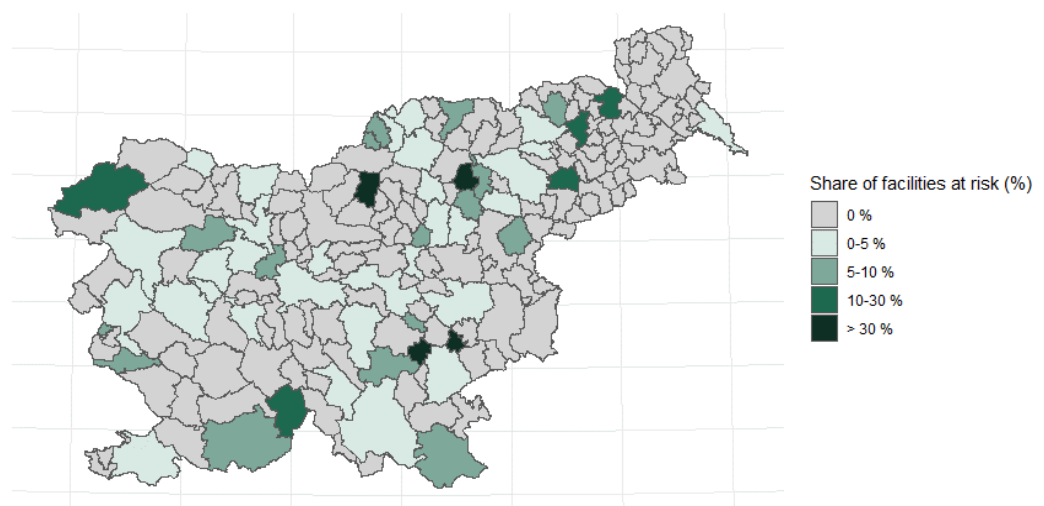
Sources: Bank of Slovenia, AJPES, SloExport, GURS, ChatGPT, Google MAPS, company websites, own calculations.

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[21] If we identify multiple industrial facilities in a single municipality, we consider only one.

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8 Robustness checks

In this chapter we make robustness tests of "performing companies at risk", based on the conclusions in Chapter 5, "*Risk assessment of the economy and the banking system*". Previously, we calculated that our performing companies at risk have approximately EUR 7 bn of operating revenue. Most of it (EUR 6.2 bn) is foreign operating revenue. Those companies have EUR 2.5 bn of trade receivables from Germany and EUR 1.1 bn of bank exposure. Now, we use the given numbers and definitions as our foundation and then modify certain assumptions or test various limitations individually one by one, while keeping everything else unchanged.

8.1 Changing the share of receivables to Germany

First, we change our assumption regarding the 10% threshold for the share of trade receivables in operating revenue. In the main analysis, we calculated that companies at risk have EUR 7 bn of operating revenue and EUR 1.1 bn of bank exposures.

In Figure 16, we can see that setting the share to 0%[22] substantially increases operating revenues from EUR 7.0 bn to EUR 10.0 bn (increase from 5.0% as share of total economy to 7.1%) and exposures from EUR 1.1 bn to EUR 1.3 bn (increase from 6.6% as share of total economy to 8.1%).[23] On the other hand, increasing the share by 5 percentage points does not have such a dramatic impact. If we set the threshold at 20%, the operating revenue at risk amounts to EUR 5.8 bn, with an exposure of EUR 0.9 bn. Furthermore, increasing the share to 30% substantially lowers the operating revenues and exposures at risk.

Figure 16: **Impact of different thresholds for the share of trade receivables to Germany in operating revenues on operating revenue (left) and exposure (right)**
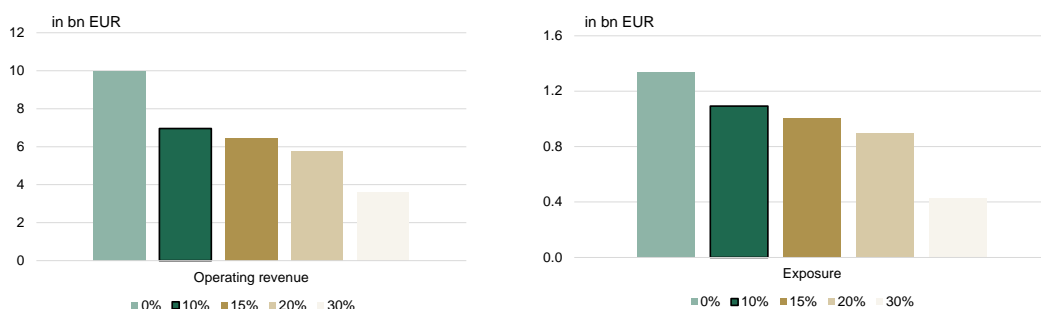
Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
Note: Please note that our analysis primarily focuses on the manufacturing sector. Companies in the wholesale sector are not extensively included, as they are more related to trade obligations rather than trade receivables within the German industry. Due to data limitations, smaller companies might be missing in our analysis. However, we have tested and confirmed that the overall coverage remains high.

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[22] Note that the sample of companies is still limited to companies that report into the trade receivables database.
[23] We show the impact of different thresholds on added value and number of employees in Appendix 12.7.

8.2 Including companies at risk from other industries, including non-borrowers, and relaxing the dependence on Germany by including other countries also

In Chapter 5, we estimated main results. Companies at risk sum to 5% of total companies in operating revenues (EUR 7 bn) and 6.6% of exposures to companies (EUR 1.1 bn). Next, we change some other conditions. The main results are shown in the first column in Figure 17. In the second column, we relax the limitation of company dependence solely on the German market. We now apply a 10% threshold to all countries in the trade receivables database combined, which increases the operating revenue at risk by EUR 2.7 bn (operating revenue at risk as a share of the total economy increases from 5.0% to 6.9%).

We previously highlighted that increases in trade receivables are merely an approximation for operating revenues. Therefore, we test the robustness of this definition by applying a 10% threshold to all countries in the trade receivables database combined, this time calculating it as the share of foreign operating revenue in total operating revenues.[24] We observe that the results do not change substantially (see second and third columns), which assures us that trade receivables can be used as a proxy.

In the fourth column, we set the trade receivables threshold to 0% while remaining restricted to the trade receivables database. This means that we include in the calculations only companies that report to the trade receivables database. This results in an additional increase of EUR 0.35 bn in operating revenue at risk, which increases the share of the total economy to 7.1%.

If we do not limit ourselves to companies reporting to the trade receivables database (here we keep all the companies that have at least some foreign operating revenue), the operating revenue at risk in the fifth column increases further by EUR 0.44 bn. Operating revenue at risk as a share of the total economy compared to the main result increases further to 7.4%.

In the sixth column, we compare the main results for our performing companies at risk with the same list of companies, but without restricting ourselves to the manufacturing sector (C). Note that the identification of all industries is less validated. Using trade receivables in the context of industries selling German automotive products (i.e. wholesale) is not as informative.

Lastly, in the seventh column, we relax the constraint of including only performing companies that are bank borrowers. If we also include non-borrowers, the operating revenue at risk would increase by EUR 0.42 bn compared to the main result.

Looking at the exposures, the increases are not that dramatic. In the most conservative case, the exposure amounts to EUR 1.4 bn (fifth column) compared to EUR 1.1 bn in the main results.

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[24] We can only perform this analysis without conditioning on dependence on Germany, as we lack the country-specific breakdown of foreign operating revenue in the accounting database.

Figure 17: **Robustness checks of various assumptions and data limitations on operating revenue (left) and exposure (right)**[25]
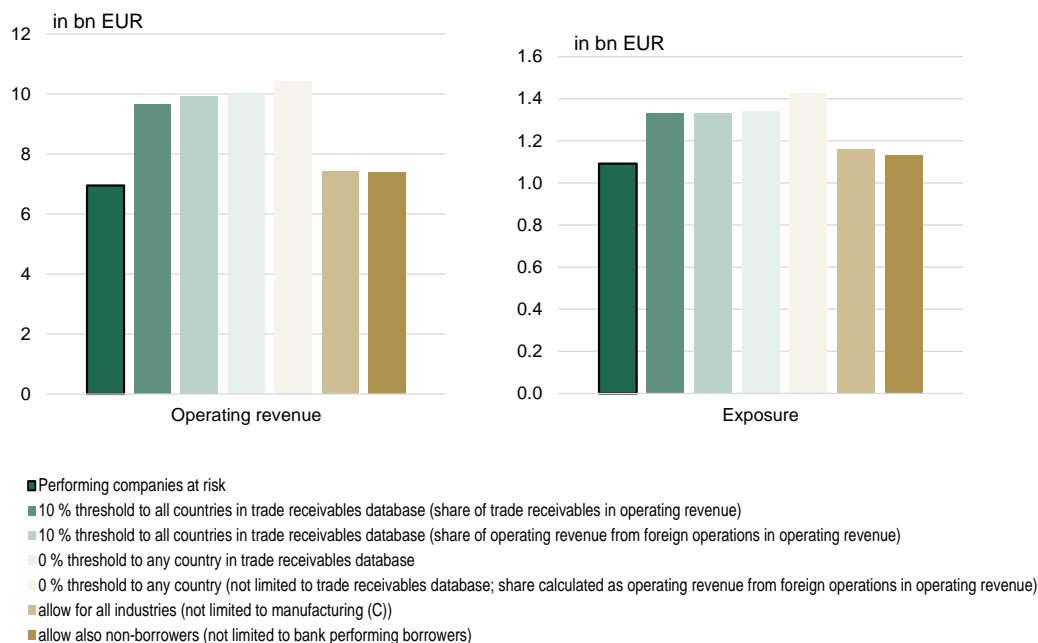
■ Performing companies at risk
■ 10 % threshold to all countries in trade receivables database (share of trade receivables in operating revenue)
■ 10 % threshold to all countries in trade receivables database (share of operating revenue from foreign operations in operating revenue)
□ 0 % threshold to any country in trade receivables database
□ 0 % threshold to any country (not limited to trade receivables database; share calculated as operating revenue from foreign operations in operating revenue)
■ allow for all industries (not limited to manufacturing (C))
■ allow also non-borrowers (not limited to bank performing borrowers)

Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
Note: When including all industries, the effect from the trade industry (G45) (wholesale) is likely underestimated, as our methodology is based on receivables, whereas in trade it would make more sense to focus on liabilities to Germany.

8.3 More conservative estimates

Now we change more assumptions and limitations simultaneously to determine more conservative estimates. In the first scenario, we revisit the figures from the previous chapter, where we applied a 0% threshold to any country without restricting ourselves to the trade receivables database.[26] In that case, we obtained EUR 3.5 bn additional operating revenue at risk (the share increases to 7.4%). Allowing also for non-borrowers (whole economy not limited to bank exposures), the amount of operating revenue at risk increases by EUR 4.2 bn and totals EUR 11.2 bn, which is a lot more than the EUR 7 bn in the main results (operating revenue at risk as a share of the total economy increases from 5.0% to 7.9%). This is the total operating revenue at risk for all manufacturing companies that we identified to be operating in the automotive industry, irrespective of their country dependence.

Looking at the exposures, our estimates for the performing companies at risk were EUR 1.1 bn. If we are more conservative, the numbers could amount to EUR 1.52 bn. Note that in all those conservative estimates, we include all companies from the list of "identified companies" but still restrict ourselves to the manufacturing sector (C). Note also that these figures are conservative, and it is not accurate to conclude that all these companies are at risk.

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[25] The results for added value and number of employees are in Appendix 12.8.

[26] In the first chapters, we note that if we do not restrict ourselves to the trade receivables database, we include many more companies. However, the amount of operating revenue and exposure does not increase significantly.

Figure 18: **Impact of more conservative assumptions on operating revenue (left) and exposure (right) (within manufacturing sector)**[27]
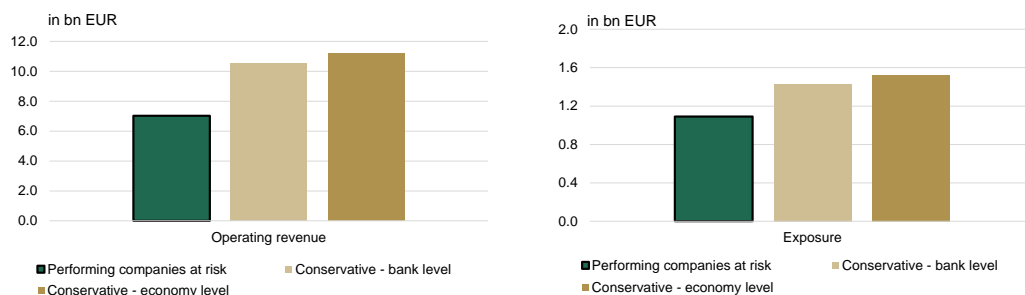
Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
Notes: **Conservative – bank level:** 0% threshold to any country (not limited to trade receivables database),
Conservative – economy level: 0% threshold to any country (not limited to trade receivables database) and not limited to bank performing borrowers.
Due to data limitations, smaller companies might be missing in our analysis. However, we have tested and confirmed that the overall coverage remains high.

8.4 Limitations of the analysis

Due to data limitations, our analysis has certain drawbacks. First, our final list of performing companies at risk does not include companies that are not part of the SloExport database or the trade receivables database. We can only be certain that all companies in industry *C29 – Manufacture of motor vehicles, trailers and semi-trailers* are included, as the inclusion of the entire C29 was an additional step in our identification process.

Our identification may be overly conservative. We lack information on the robustness and flexibility of individual companies. For example, we know that the included companies operate in the automotive industry and have more than 10% dependence on the German market according to our definition. However, we cannot determine their exact manufacturing mix. For some companies, their dependence on the automotive industry might be only a few percent. Hence not all risks will materialize for all companies. Many companies will effectively tackle challenges through various forms of restructuring. Some companies possess highly competitive or rare technologies that can readily attract customers in other markets (e.g. China). Additionally, some companies will adapt with ease and may even shift their focus to industries other than the automotive.

Additionally, it is challenging to differentiate between companies that manufacture products for used cars and those for electric vehicles. For these companies, the potential transition may be less difficult. Furthermore, our analysis includes companies involved in the activity *C29.2 – Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers*, and it may also encompass those producing trailers, semi-trailers, tractors, motorbikes and similar products. These activities might not necessarily be at risk unless they are also producing parts for the automotive industry. In this regard, our approach may be overly conservative.[28]

We do not consider other current risks that could exacerbate the situation for companies, such as geopolitical risks, energy prices and trade tariffs. The manufacturing sector is also very climate-sensitive, as discussed in Sokolovska (2022). Risks related to climate change and related policies are not analysed in this paper. On the

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[27] Results for added value and number of employees are in Appendix 12.9.

[28] Industry *C30,* "*Manufacture of other transport equipment, i.e. for shipbuilding, railway, spacecraft, motorcycles, etc.*", may be intuitively linked to the automotive industry; however, it is not included in its entirety. Only companies within C30 that explicitly identify as part of the automotive industry (according to the SloExport database) are considered.

one hand those risks already impose an additional financial burden on the companies. However, if the risks to the automotive industry addressed in this paper are to materialize, then policymakers might rethink the climate agenda and alleviate the burden on the automotive industry in order to keep them alive. On the other hand, it can also be argued that certain climate policies may foster competitive advantages in specific activities and create new opportunities for these companies.

It is important to note that this analysis primarily focuses on the dependence of companies on the German market. The automotive industry in other countries may also face challenges, particularly if they rely on Germany. We have included some robustness checks to account for this.

Our analysis focuses on the manufacturing sector (C) and companies in the S11 sector, excluding sole proprietors. Another significant industry that will be impacted is motor vehicle sales (wholesale). We do not include this industry, because it is much harder to identify companies dependent on the German market, as we would need information on payments to Germany rather than trade receivables from Germany. Additionally, other industries may have companies that supply products or services to the German automotive industry. We provided some robustness checks. Note that sole proprietors are completely out of the scope of this analysis, due to lack of data availability.

It is also important to note that our methodology can only cover the first-round direct effects. We cannot identify companies that may be in trouble due to risks faced by their foreign parent company or shareholders as a result of a shock in the automotive industry. Additionally, we cannot thoroughly address all the risks that may spill over from the companies we have identified to their associated entities. We will discuss possible spillover effects along the supply chains and associated entities in the next chapter.

9   Spillover effects

9.1 Spillover as identified by input-output tables

Given the important role of the automotive industry for Slovenia's economy and Germany's significance as a business partner, any disruptions are likely to have repercussions across various business sectors. In addition to our primary analysis of the automotive industry, we also aim to highlight other vulnerable industries and explore potential second-round or spillover effects.

In Chapter 3, "*Identification of industries at risk with input–output tables*", we identified industries at risk in Slovenia due to a decline in demand from the German automotive industry. Building on this, we now seek to identify additional industries in Slovenia that could suffer consequences as a result of disruptions in those identified industries at risk in Slovenia (second-round effect along supply chains).

There are two possible channels from which additional industries can be identified. First, we examine the effect if our identified industries at risk in Slovenia lower the demand for their inputs (which are at the same time outputs of other industries) and show the results in Figure 19 (upstream value chain). We show the shares of output of indirectly dependent industries/suppliers on the left into identified industries at risk on the right. The industries on the right, identified in Chapter 3, "*Identification of industries at risk with input–output tables*",[29] are more or less confirmed in Figure 6 in Chapter 5, "*Risk assessment of the economy and the banking system*". The industries on the left are identified if the share of their total output that goes to one of the previously identified industries at risk on the right is greater than 4%.[30] Using this approach, we can identify the following second-round industries at risk:

- *C26 – Manufacture of computer, electronic and optical products*,
- *C33 – Repair and installation of machinery and equipment*,
- *D35 – Electricity, gas, steam and air-conditioning supply*,
- *G45 – Wholesale and retail trade and repair of motor vehicles and motorcycles,* and
- *N78 – Employment activities*.

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[29] In Figure 19, we can see industries C24, C25, C27, C28 and C29. We have included in the calculations also industries C22 and C23, which are not shown in the figure because they have no dependent industry on the left that would have a share of total output of more than 4%.

[30] The threshold is based on expert judgement (in order to provide a meaningful figure).

Figure 19: **Spillover effects from industries at risk to their suppliers (upstream value chain)**
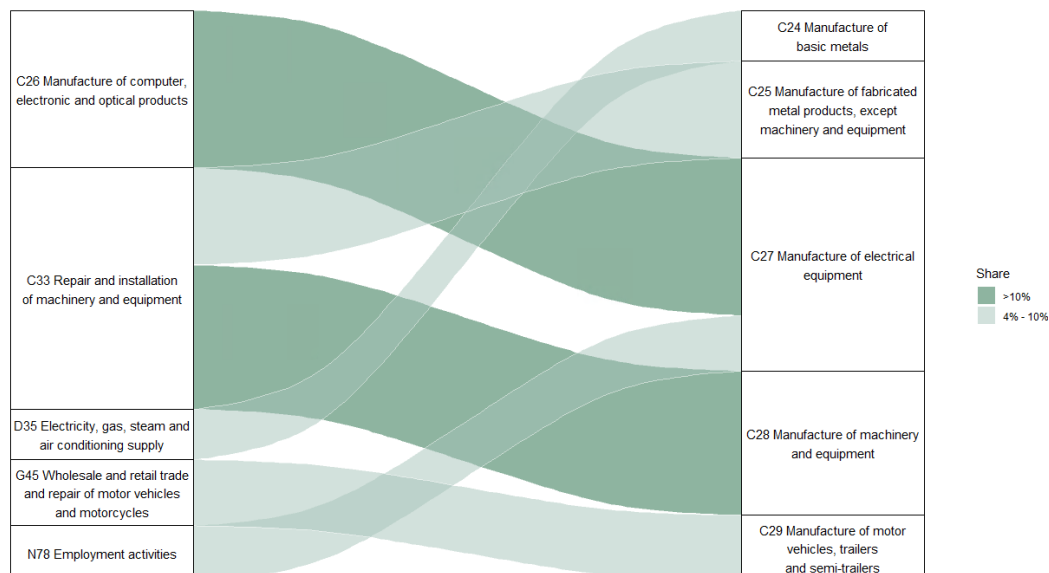
Sources: Eurostat, own calculations.
Notes: We include output to economies, households and governments of different countries. Input–output relations of industry with itself are not excluded in the calculations, but we exclude them in the figure. Gross fixed capital formation and changes in inventories and acquisition less disposals of valuables are excluded.

Second, we examine the effect if our identified industries stop producing their output and consequently do not provide inputs to other industries (downstream value chain). We show the results in Figure 20. Here we identify industries if the share of their total input that comes from one of the previously identified industries is greater than 3%.[31] The identified industries are the following:

- *C19 – Manufacture of coke and refined petroleum products*,
- *C26 – Manufacture of computer, electronic and optical products*,
- *C30 – Manufacture of other transport equipment*,
- *C33 – Repair and installation of machinery and equipment*,
- *F – Construction*,
- *G45 – Wholesale and retail trade and repair of motor vehicles and motorcycles*,
- *H51 – Air transport*, and
- *L – Real estate activities*.

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[31] The threshold is based on expert judgement (in order to provide a meaningful figure).

Figure 20: **Spillover effects from industries at risk to their customers (downstream value chain)**
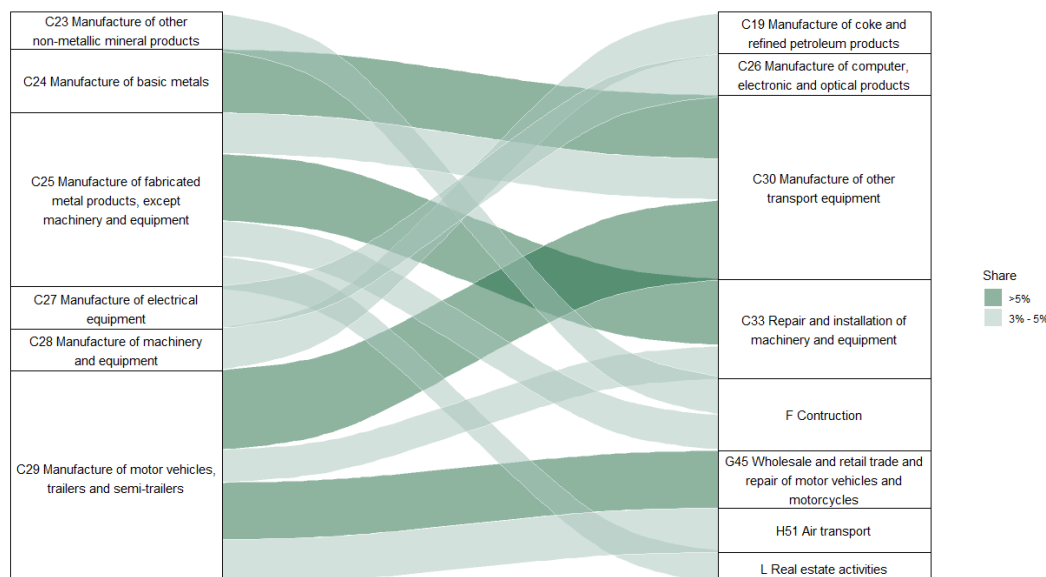

Sources: Eurostat, own calculations.
Notes: We include output to economies, households and governments of different countries. Input–output relations of industry with itself are not excluded in the calculations, but we exclude them in the figure. Gross fixed capital formation and changes in inventories and acquisition less disposals of valuables are excluded.

9.2 Spillover via associated entities

Given the complex ownership structures of many companies, particularly larger ones, issues within one company can often cascade throughout the entire group of associated entities. To account for this, we extended our analysis to include companies with ownership ties to those identified as at risk in the main part. Due to data constraints, we manually identified these related companies.

We examined the associated entities of the five largest of the performing companies at risk based on both operating revenues and exposures. We used information from their websites and the bizi.si website. Our focus was on related companies headquartered in Slovenia. We included additional companies in the final list of performing companies at risk if the operating revenue of the originally identified company exceeded 15% of the group's operating revenue.[32] We included these additional companies regardless of their performing status or share of trade receivables, as was the case for the identification process in Chapter 4, "*Identification of companies at risk*".

By such a procedure, we identified 30 additional companies that are related to the original five biggest companies (by operating revenue and by exposure) from the performing companies at risk list. Adding those companies increases the operating revenue at risk by 7% (from EUR 7 bn to EUR 7.42 bn), while the exposure increases by only 2% (from EUR 1.1 bn to EUR 1.12 bn). However, these are individual companies potentially operating in different segments, so it is not necessarily the case that those risks will materialize. Nonetheless, as associate companies, difficulties faced by one could potentially impact the others.

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[32] Due to data constraints, the group's operating revenue is calculated as the sum of the operating revenues of companies within the group that are headquartered in Slovenia.

10 Conclusion

The analysis addressed the importance of exports to the German automotive industry for Slovenia from multiple perspectives. We identified performing companies at risk as those operating within the automotive industry, that are performing bank borrowers and that have at least 10% of their total operating revenues from claims to Germany. These companies have approximately EUR 7 bn of operating revenues and EUR 1.1 bn of bank exposures. Companies under the given definition represent 10% of foreign operating revenues of all companies, 6.6% of bank exposures to companies, 5% of operating revenues of companies, 5.3% of value added and 5.4% of all employees. These companies primarily belong to four industries based on their operating revenues and bank exposures:

- *C29 – Manufacture of motor vehicles, trailers and semi-trailers*,
- *C24 – Manufacture of basic metals*,
- *C27 – Manufacture of electrical equipment*,
- *C25 – Manufacture of fabricated metal products, except machinery and equipment*.

This finding is consistent with the analysis of input–output tables. In the first two industries, the share of performing companies at risk is more than 50% in terms of operating revenue and exposures.

We were also interested in the financial health of the identified companies. We found that performing companies at risk have substantially reduced their debt and increased liquidity since the great financial crisis. However, we also note that the share of operating revenues of those companies in the total economy has been slowly falling again in recent years. Therefore, we checked whether some risks had already materialized by the end of 2024. Analysing default rates does not confirm this hypothesis. The risks have not yet started to materialize. Though there was a downturn in trade receivables in the last two months of 2024, this stabilized in the early part of 2025.

Next, we performed risk assessment of individual banks and municipalities that are exposed to the identified companies at risk. We concluded that all banks have shares of risky companies (under our main definition) to all companies lower than 10% (lower than 5% if we look at total exposures to all segments), while five banks have shares lower than 1% (note that banks have exposures also to other segments). At the municipality level, we found some clusters around a few municipalities with larger shares of industrial facilities or operating revenues at risk.

It is important to emphasize that we arbitrarily set the threshold of the share of trading receivables to operating revenues to Germany to 10%. It definitely is not the case that all those companies will default or become insolvent. Nonetheless, it may happen that many of these companies will need to revise their manufacturing mix or business strategy. In the analysis, we performed some robustness checks to test other thresholds.

We found that setting the share to 0% substantially increased the amount of operating revenues at risk from EUR 7.0 bn to EUR 10 bn and exposures at risk from EUR 1.1 bn to EUR 1.3 bn. On the other hand, increasing the share by 5 or 10 percentage points did not have such a dramatic impact. If we set the threshold at 20%, the operating revenue at risk decreases from EUR 7 bn to EUR 5.8 bn and the exposure from EUR 1.1 to EUR 0.9 bn. Next, we changed some other conditions. For instance, we relaxed the limitation of company dependence solely on the German market. We applied a 10%

threshold to all countries in the trade receivables database combined, which increased the operating revenue at risk by EUR 2.7 bn to EUR 9.7 bn.

Due to data limitations, our analysis has certain drawbacks. Note that we addressed many of the possible limitations in our various robustness checks. Our list of performing companies at risk does not include companies that are not part of the SloExport data-base or the trade receivables database (i.e. small companies and sole proprietors). Nevertheless, we have performed tests and concluded that the coverage is adequate. We also lack information on the robustness and flexibility of individual companies. Fur-ther, many may be able to easily restructure even in the event of a major shock.

It is important to note that this analysis primarily focuses on the dependence of com-panies on the German market. We focus solely on the manufacturing sector (C) and companies in the S11 sector, excluding sole proprietors. We do not consider other cur-rent risks that could exacerbate the situation for companies, such as geopolitical risks, energy prices, climate risks or US trade tariffs.

We also addressed possible spillover effects. We checked what could be the effect of including associated entities for the biggest companies in our list. Operating revenue at risk increases by 7% to EUR 7.42 bn, while the exposure at risk increases by only 2% to EUR 1.12 bn. Second, we utilized input–output tables to identify possible spillo-ver effects along the supply chains to buyers and to sellers. Using this approach, we can identify some further second-round industries at risk, the first four, for instance, being:

- *C26 – Manufacture of computer, electronic and optical products*,
- *C33 – Repair and installation of machinery and equipment*,
- *G45 – Wholesale and retail trade and repair of motor vehicles and motorcycles,* and
- *N78 – Employment activities*.

The impact on operating revenue, exposure to companies, added value and number of employees appears to be manageable. However, it is important to note that the esti-mates are based on certain aforementioned assumptions and that this represents only the first-round effects, with potential supply chain spillovers. This research could guide policymakers in mitigating risks and supporting affected businesses. Future research could explore the impact of the German automotive industry's slowdown on Slovenian banks' profitability, potential contagion effects within the banking sector and the prob-ability of default for exposed companies. Additionally, analysis of the economic impact on municipalities with high exposure would provide valuable insights. This could include assessing changes in local employment, tax revenues and economic activity.

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12   Appendix

12.1 List of included CPA codes

13.96.15 Tyre cord fabric of high tenacity yarn of nylon or other polyamides, polyesters or viscose rayon

22.11.11 New pneumatic tyres, of rubber, of a kind used on motor cars

25.72.14 Hinges, mountings, fittings and similar articles, suitable for motor vehicles, doors, windows, furniture and the like, of base metal

26.52.13 Instrument panel clocks and clocks of a similar type for vehicles

28.11.41 Parts for spark-ignition internal combustion engines, excluding parts for aircraft engines

28.29.13 Oil filters, petrol filters and intake air filters for internal combustion engines

30.91.1 Motorcycles and side-cars

30.91.2 Parts and accessories of motorcycles and side-cars

30.91.3 Internal combustion engines of a kind used for motorcycles

30.91.9 Sub-contracted operations as part of manufacturing of motorcycles

We also include all subcodes of "C29 – Motor vehicles, trailers and semi-trailers".

12.2 List of NACE manufacturing industries (C)

C10 – Manufacture of food products

C11 – Manufacture of beverages

C13 – Manufacture of textiles

C14 – Manufacture of wearing apparel

C15 – Manufacture of leather and related products

C16 – Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials

C17 – Manufacture of paper and paper products

C18 – Printing and reproduction of recorded media

C19 – Manufacture of coke and refined petroleum products

C20 – Manufacture of chemicals and chemical products

C21 – Manufacture of basic pharmaceutical products and pharmaceutical preparations

C22 – Manufacture of rubber and plastic products

C23 – Manufacture of other non-metallic mineral products

C24 – Manufacture of basic metals

C25 – Manufacture of fabricated metal products, except machinery and equipment

C26 – Manufacture of computer, electronic and optical products

C27 – Manufacture of electrical equipment

C28 – Manufacture of machinery and equipment n.e.c.

C29 – Manufacture of motor vehicles, trailers and semi-trailers

    C29.1 – Manufacture of motor vehicles

    C29.1.0 – Manufacture of motor vehicles

    C29.2 – Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers

    C29.2.0 – Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers

    C29.3 – Manufacture of parts and accessories for motor vehicles

    C29.3.1 – Manufacture of electrical and electronic equipment for motor vehicles

    C29.3.2 – Manufacture of other parts and accessories for motor vehicles

C30 – Manufacture of other transport equipment

C31 – Manufacture of furniture

C32 – Other manufacturing

C33 – Repair and installation of machinery and equipment

12.3 Data coverage of SloExport website and database on trade receivables

We have consistently pointed out that our identification of "performing companies at risk" is constrained by the availability of individual company information on the SloExport website and in the trade receivables database. The coverage of these sources can be most accurately compared using a subsample of companies in the industry "*C29 – Manufacture of motor vehicles, trailers, and semi-trailers*", as the majority of filters in the SloExport database are focused on the automotive industry. The figure below demonstrates that the coverage is quite extensive.

Figure 21: **Data coverage of SloExport website and database on trade receivables based on industry C29**
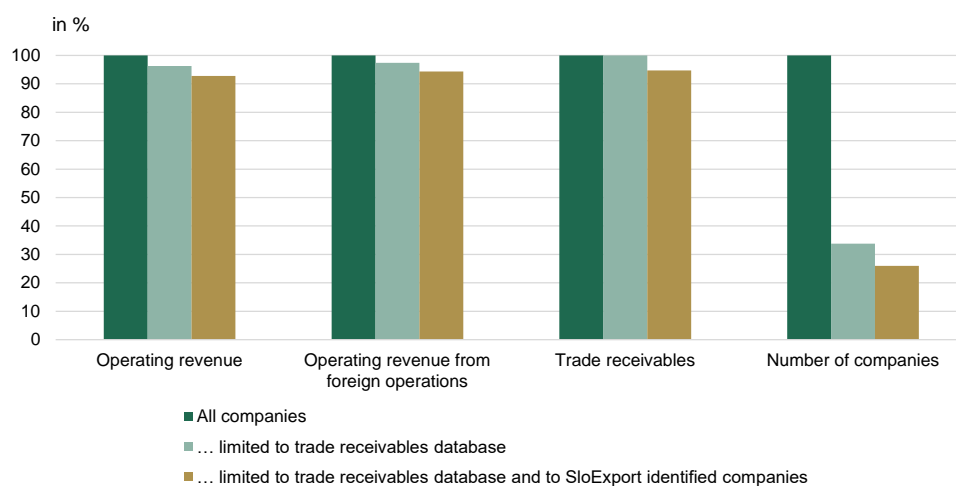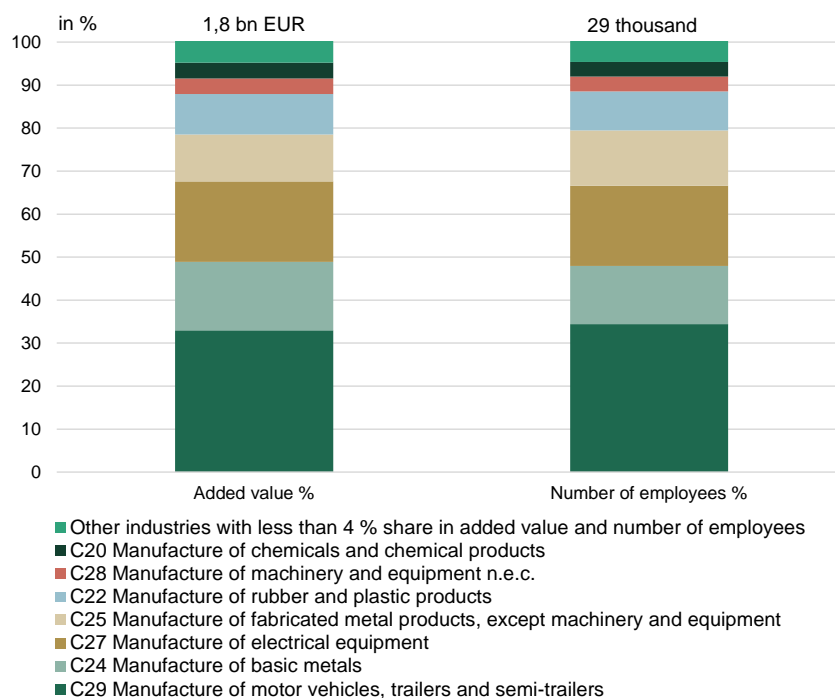

Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
Note: Database is limited to industry C29, to performing borrowers, and to companies that have foreign operating revenue > 0.

12.4 Industry decomposition of performing companies at risk by added value and number of employees

Figure 22: **Industry decomposition of performing companies at risk, by added value (left) and number of employees (right)**

Legend:
- Other industries with less than 4 % share in added value and number of employees
- C20 Manufacture of chemicals and chemical products
- C28 Manufacture of machinery and equipment n.e.c.
- C22 Manufacture of rubber and plastic products
- C25 Manufacture of fabricated metal products, except machinery and equipment
- C27 Manufacture of electrical equipment
- C24 Manufacture of basic metals
- C29 Manufacture of motor vehicles, trailers and semi-trailers

Sources: Bank of Slovenia, AJPES, SloExport, own calculations.

12.5 Distribution of bank exposure of performing companies at risk relative to the total bank exposure across banks

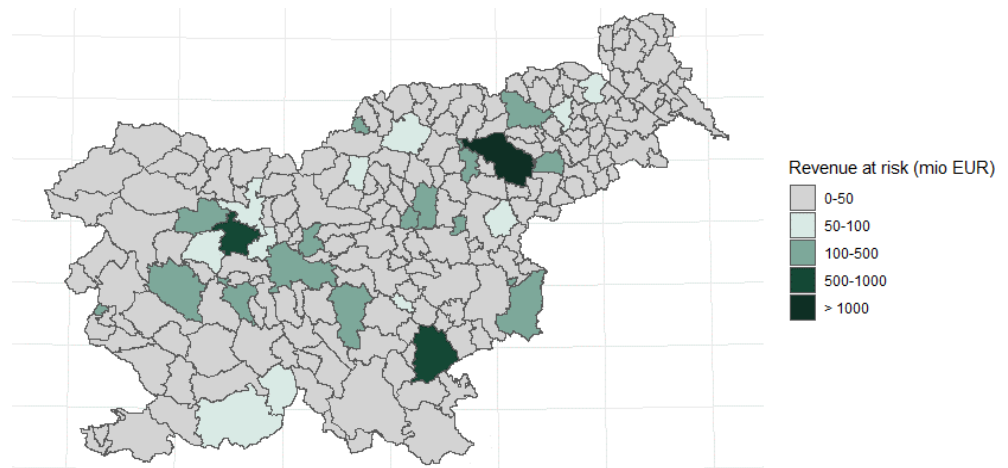Figure 23: **Share of exposures to companies at risk in total exposures across banks**
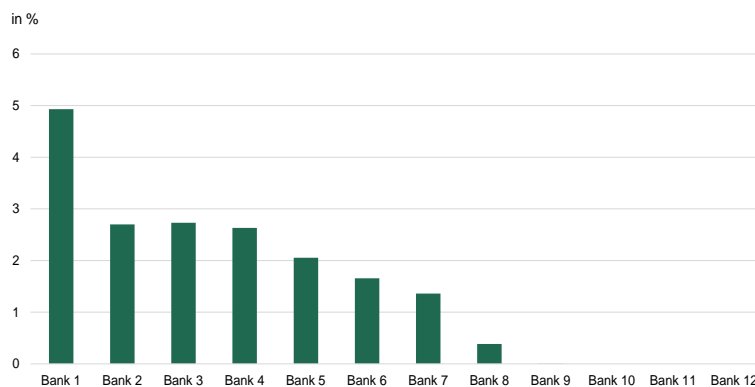
Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
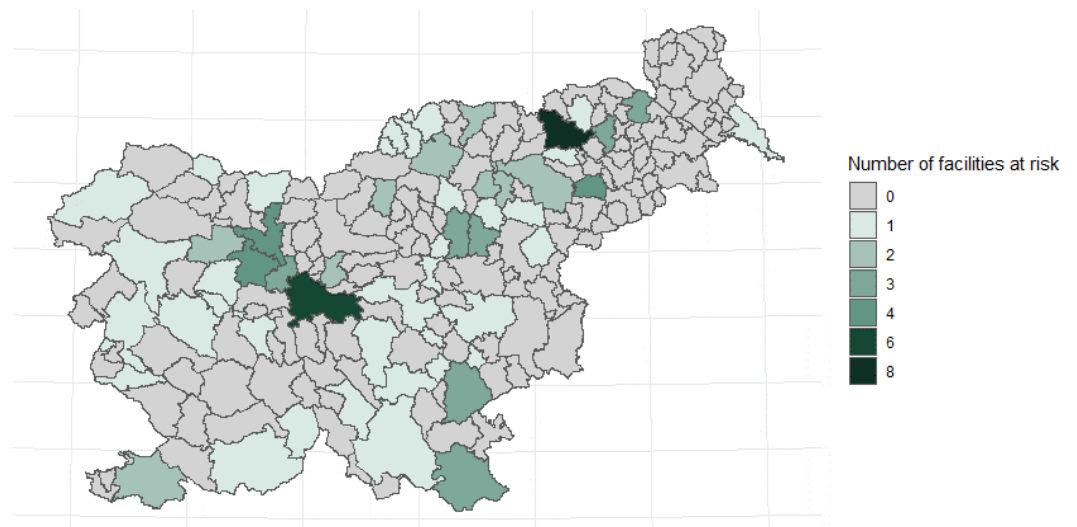Note: Exposures are defined as performing classified claims, gross on-balance and off-balance sheet.

Figure 24: **Operating revenue of performing companies at risk, on the municipality level**

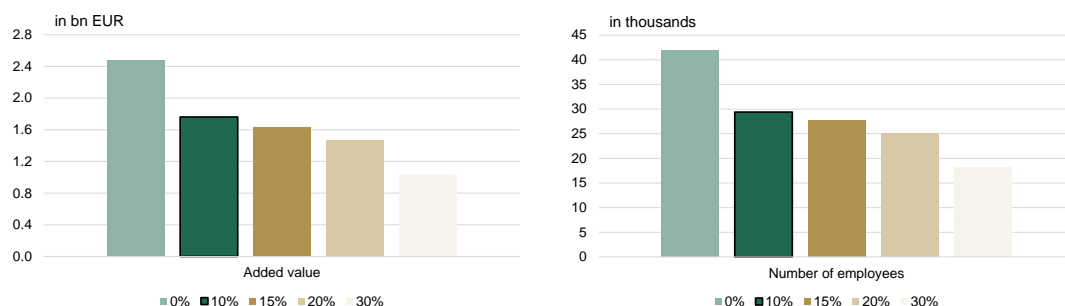Sources: Bank of Slovenia, AJPES, SloExport, GURS, own calculations.

Figure 25: **Number of industrial facilities of performing companies at risk, on the municipality level**

Sources: Bank of Slovenia, AJPES, SloExport, GURS, own calculations.

12.7 Impact of different thresholds for the share of trade receivables in operating revenues on added value and number of employees

Figure 26: **Impact of different thresholds for the share of trade receivables to Germany in operating revenues on added value (left) and number of employees (right)**
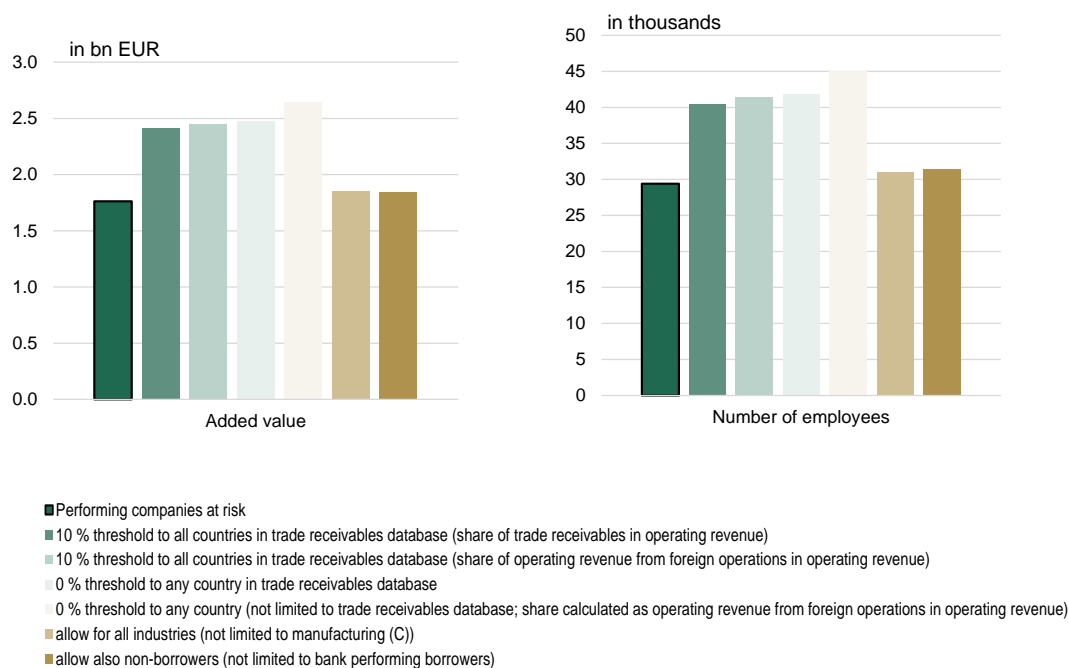

Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
Note: Please note that our analysis primarily focuses on the manufacturing sector. Companies in the wholesale sector are not extensively included, as they are more related to trade obligations rather than trade receivables within the German industry. Due to data limitations, smaller companies might be missing in our analysis. However, we have tested and confirmed that the overall coverage remains high.

12.8 Robustness checks of various assumptions and data limitations on added value and number of employees

Figure 27: **Robustness checks of various assumptions and data limitations on added value (left) and number of employees (right)**

- Performing companies at risk
- 10 % threshold to all countries in trade receivables database (share of trade receivables in operating revenue)
- 10 % threshold to all countries in trade receivables database (share of operating revenue from foreign operations in operating revenue)
- 0 % threshold to any country in trade receivables database
- 0 % threshold to any country (not limited to trade receivables database; share calculated as operating revenue from foreign operations in operating revenue)
- allow for all industries (not limited to manufacturing (C))
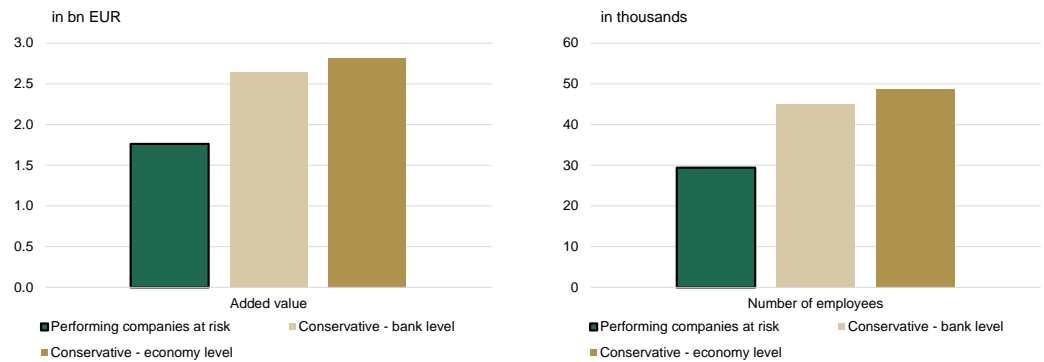- allow also non-borrowers (not limited to bank performing borrowers)

Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
Note: When including all industries, the effect from the trade industry (G45) (wholesale) is likely underestimated, as our methodology is based on receivables, whereas in trade it would make more sense to focus on liabilities to Germany.

12.9 Impact of more conservative assumptions on added value and number of employees

Figure 28: **Impact of more conservative assumptions on added value (left) and number of employees (right) (within manufacturing sector)**

Sources: Bank of Slovenia, AJPES, SloExport, own calculations.
Note: **Conservative – bank level:** 0% threshold to any country (not limited to trade receivables database)
Conservative – economy level: 0% threshold to any country (not limited to trade receivables database) and not limited to bank performing borrowers.
Due to data limitations, smaller companies might be missing in our analysis. However, we have tested and confirmed that the overall coverage remains high.