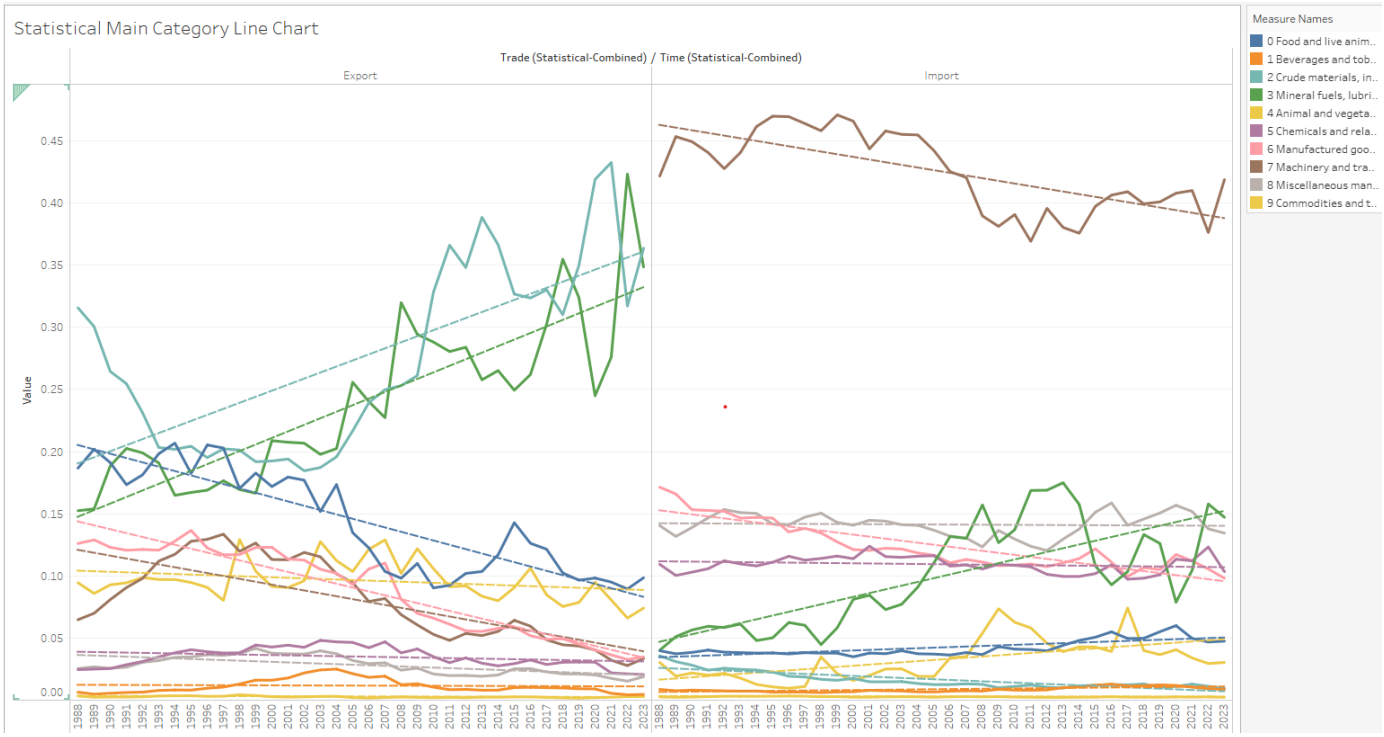
Assignment 3

Main Categories Comparison

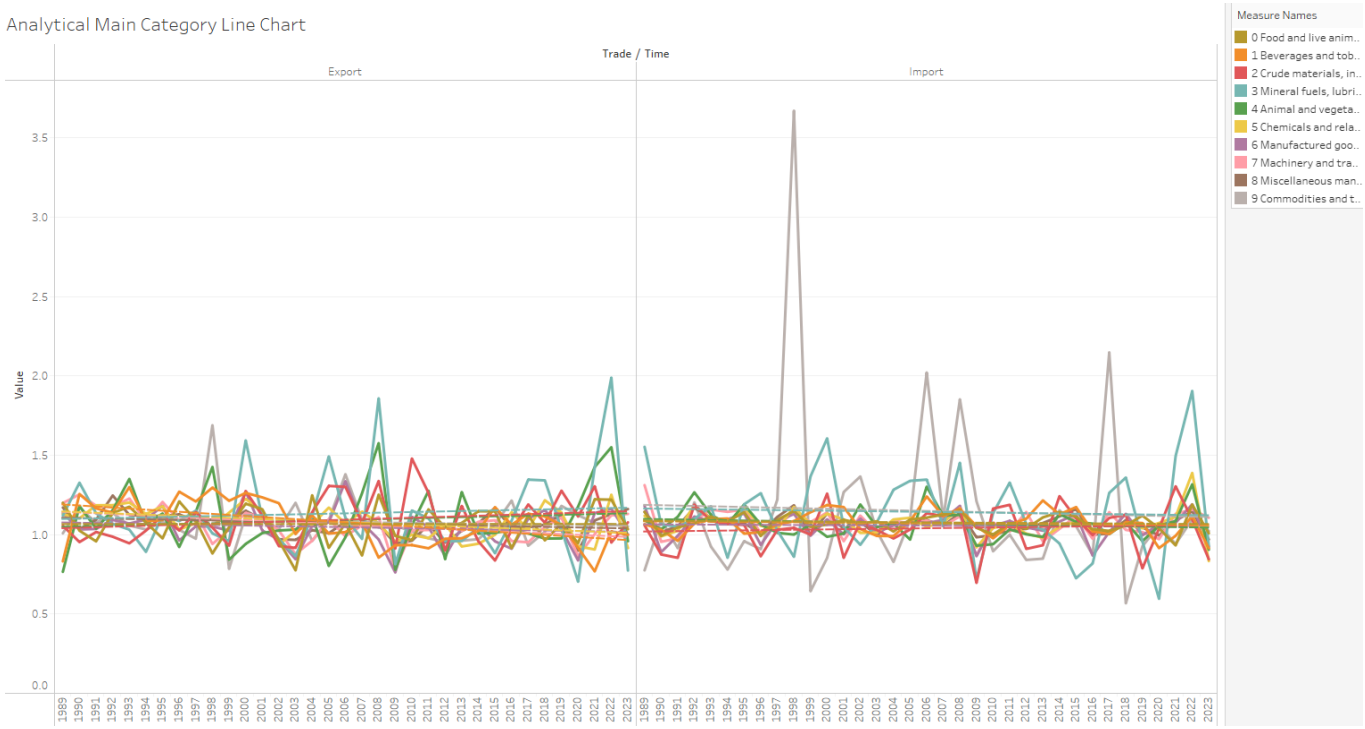
Statistical Trends



A few categories can be seen notably trending upwards over time in exports, with “2 Crude materials, inedible, except fuels” and “3 Mineral fuels, lubricants and related materials” having the steepest trend lines and ending in highest values. “0 Food and live animals”, “6 Manufactured goods classified chiefly by material”, “7 Machinery and transport equipment” display a notable and similar downward trend. Other categories have a somewhat horizontal trend over time.

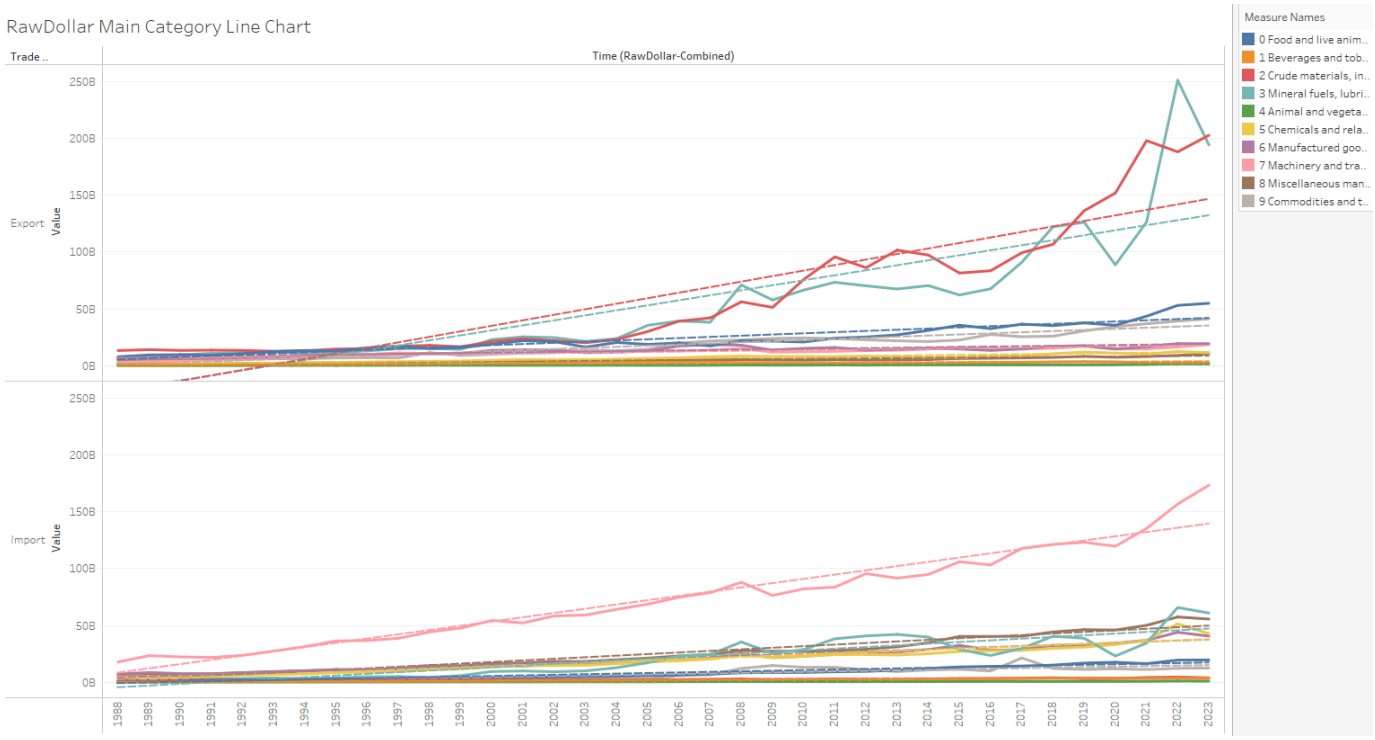
For imports, it is apparent that “7 Machinery and transport equipment” contributes a large part of imports but shows a downward trend, which is also shown by “6 Manufactured goods classified chiefly by material”. One notable upward trend is “3 Mineral fuels, lubricants and related materials”. All other categories show almost horizontal trend lines.

Analytical Trends



For both imports and exports, the trend lines are almost flat for all categories, although occasional upward and downward spikes can be seen at different times.

Raw Dollar Value Trend

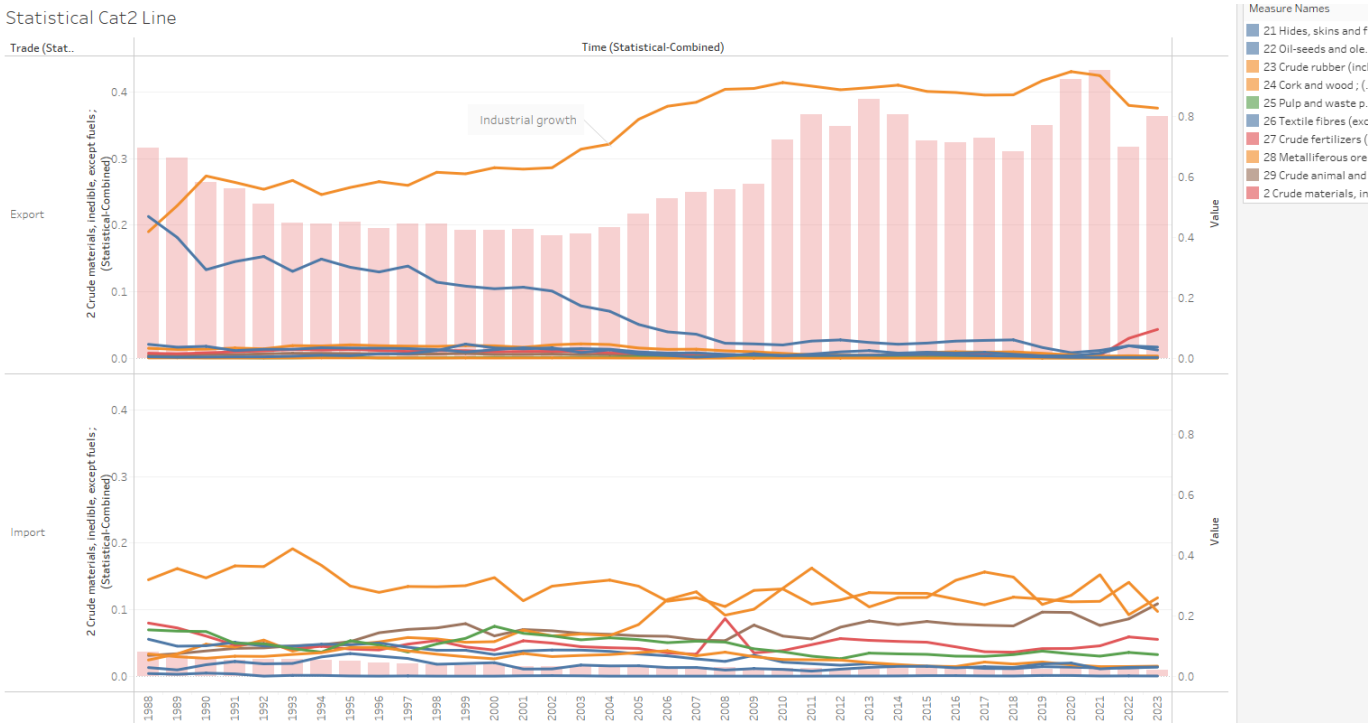


For exports, two notable upward trends - “2 Crude materials, inedible, except fuels” and “3 Mineral fuels, lubricants and related materials” can be seen, similar to that from statistical trends. And a very slight upward trend is displayed by “0 Food and live animals” and “9 Commodities and transactions not classified elsewhere in the SITC”. Other trends show close to horizontal compared to these.

For imports, “7 Machinery and transport equipment” displays the steepest trend again, with other categories having slightly upward or flat trends.

Relationship between main category and subcategories

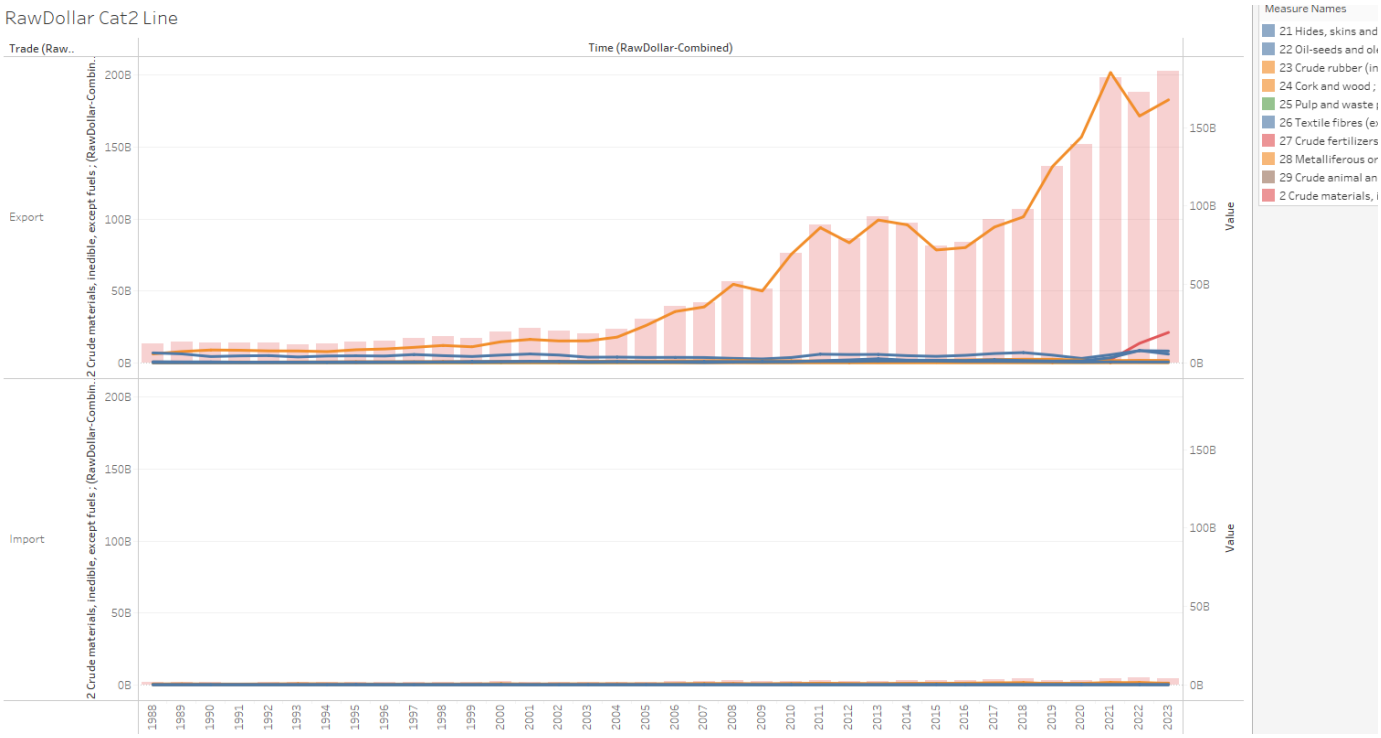
Statistical Data



Below are some major trend lines and change points seen in the statistical chart above.

- Exports
    - 28 Metalliferous ores and metal scrap: this subcategory rises with a steep trend throughout the year and rose significantly in the early 2000s. This could be due to the commodities boom that occured during that time. Since the main category also rises during that time, this subcategory contributes a lot to it. There is also a slight decrease after peaking in 2020, which could be due to the Covid-19 pandemic.
    - 26 Textile fibres and their wastes, not manufactured into yarn or fabric: opposite to metalliferous ores, this subcategory decreases with a steep trend over the years. This could be due to the shift in export interest and the increasing use of synthetic alternatives.
- Imports
    - 27 Crude fertilizers and crude minerals: this had a notable increase in 2008, which could be due to the global food price crisis.

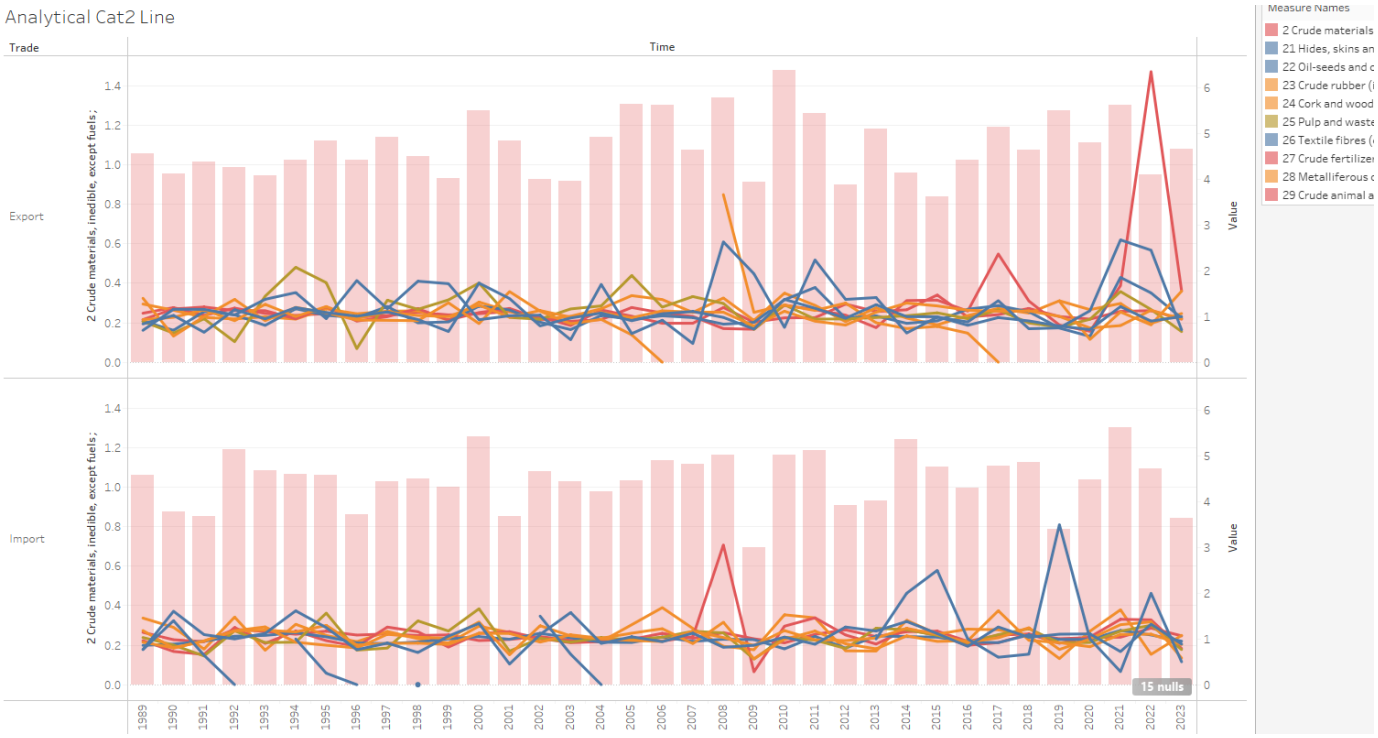
Raw Dollar Data



Below are some major trend lines and change points seen in the raw dollar chart above.

- Exports
    - 28 Metalliferous ores and metal scrap: this subcategory has a steep trend and started rising considerably from 2004, which could be due to industrial growth. After peaking in 2021, it decreased a bit in 2022. Since the main category raw dollar almost perfectly overlaps with this subcategory, it can be said that this subcategory also makes up a large part of total export raw dollar value.

Analytical Data

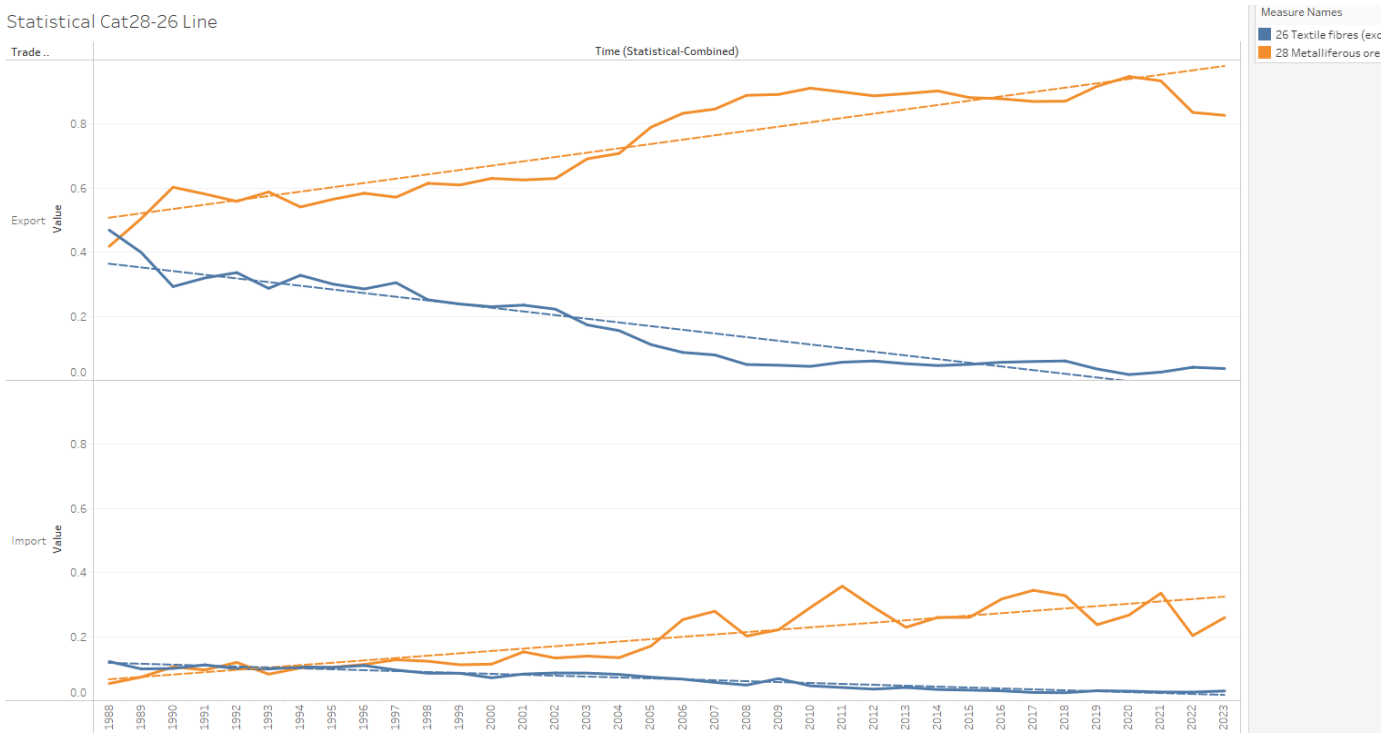


Below are some major trend lines and change points seen in the analytical chart above.

- Exports
    - 27 Crude fertilizers and crude minerals: this subcategory rose considerably up to 600% in 2022 probably due to the Russian Ukraine war since Russia is also major exporters of these materials and got sanctioned.
    - 22 Oilseeds and oleaginous fruits: This subcategory has a spike in 2008 which could be due to global food price crisis and 2021 which could be due to covid-19 pandemic.
    - 23 Crude rubber (incl. synthetic and reclaimed): This subcategory had a flat trend but also had zero points in 2006 and 2017, which could be due to trade disruptions or increasing usage of synthetic alternatives.
- Imports
    - 27 Crude fertilizers and crude minerals: like statistical analysis, this had a notable increase in 2008, which could be due to global food price crisis.
    - 21 Hides, skins and furskins, raw: this had an upward spike in 2019, which could be due to resurgence of leather products in fashion. It also had zero points in 1992, 1996, 1998 and from 2004 to 2013. This could be due to the fur-free policies announced by many famous fashion brands. It also had a small spike in 2022, which could be due to Russian Ukraine war.

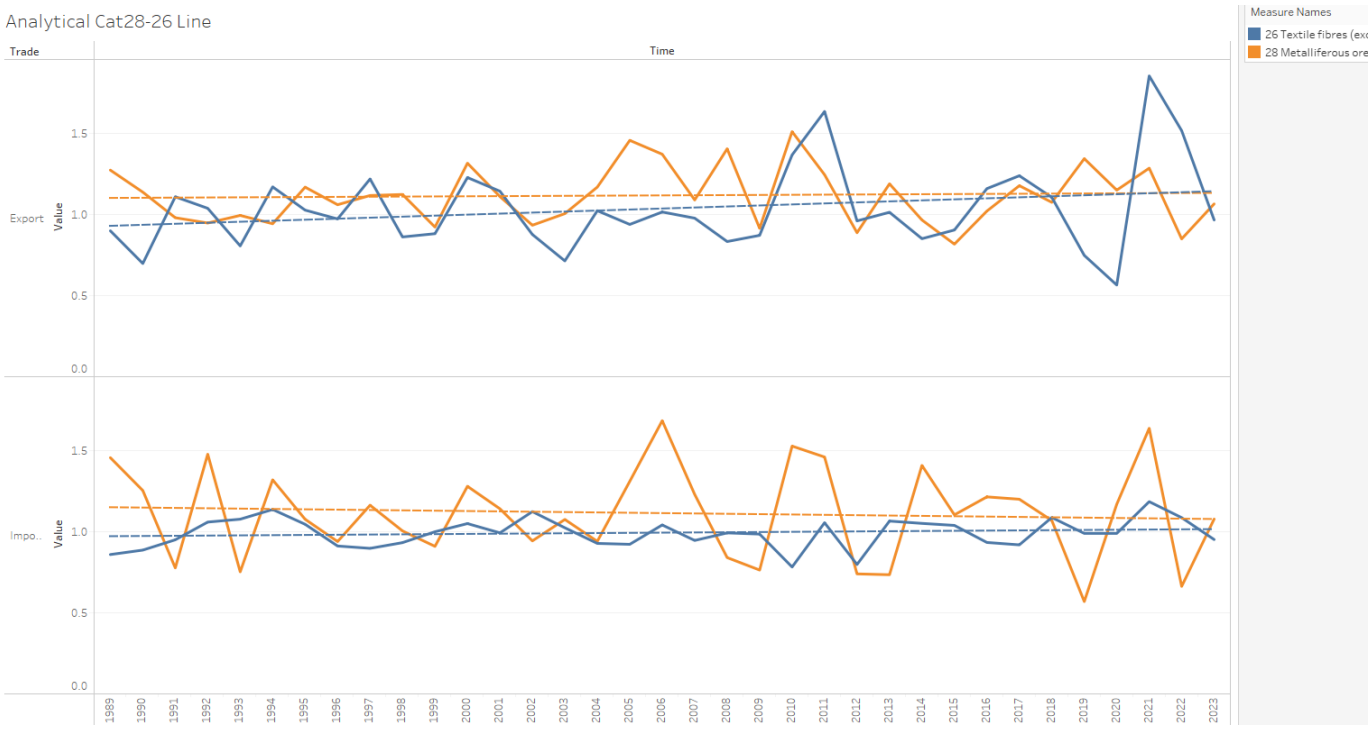
Dashboard for one subcategory and another subcategory

Since the dashboard includes four different sheets, they are shown separately below for easier viewing.

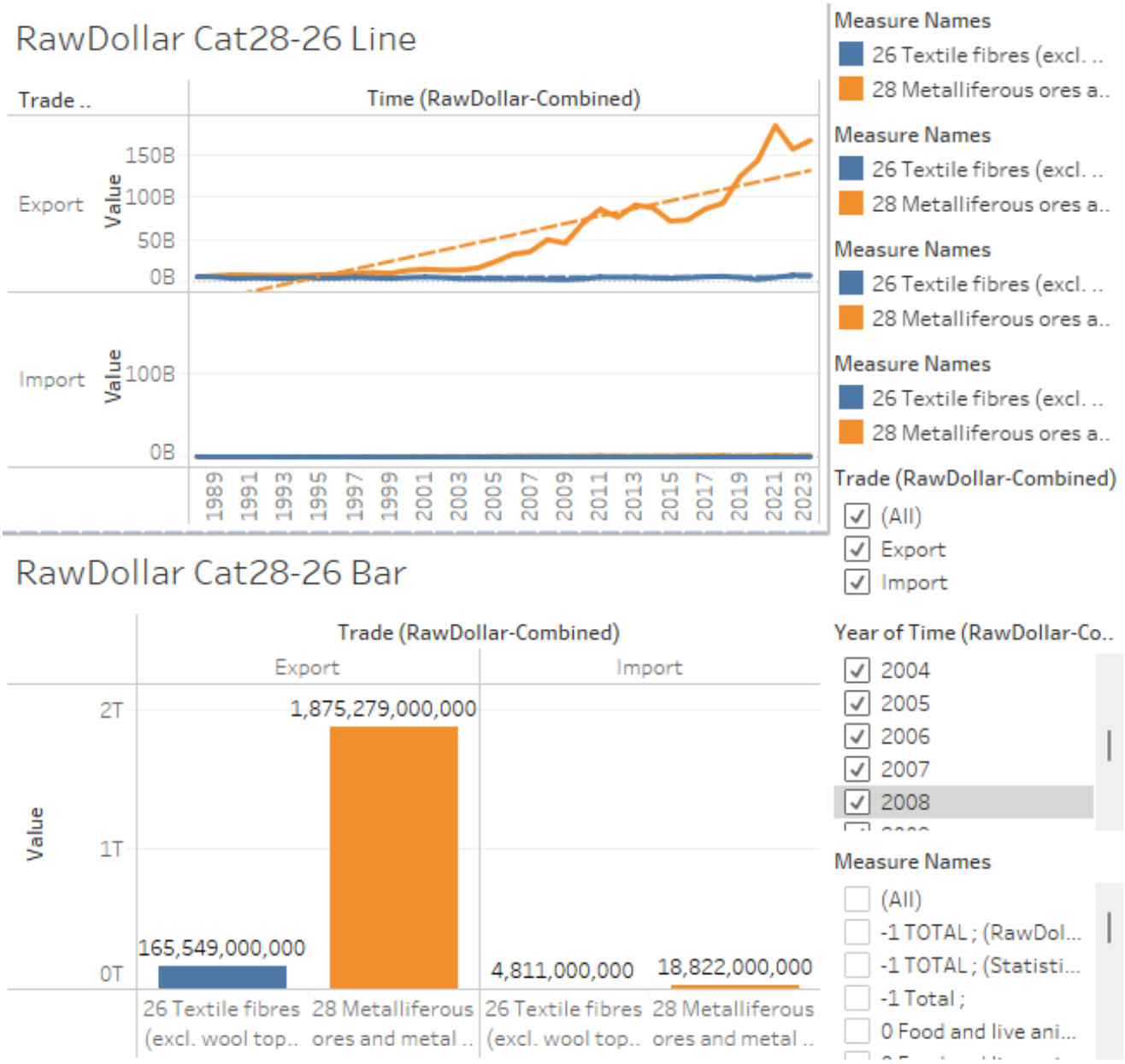


The subcategory “28 Metalliferous ores and metal scrap” was used for analysis and comparison with the other subcategory “26 Textile fibres (excl. wool tops and other combed wool) and their wastes, not manufactured into yarn or fabric”.

Based on the statistical chart, in exports, metalliferous ores show a significant upward trend which could indicate an increase in demand or production. In contrast, textile fibres show a decline over time that is almost opposite to metalliferous ores, which could mean a shift in focus leaning towards metalliferous ores or reduced global demand. For imports, metalliferous ores show a steady rise in trend with minor fluctuations, while textile fibres decrease at a steady pace. This could also mean domestic textile fibres are relied more on.



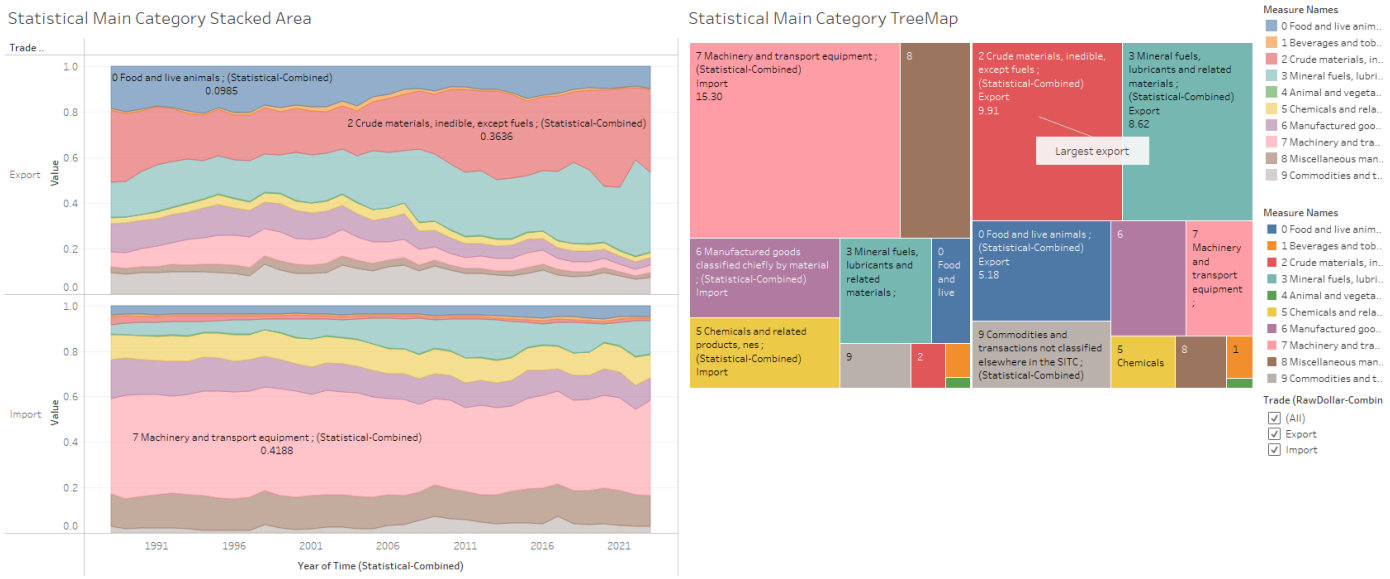
Both categories have fluctuations around 100%/1 for both imports and exports in the analytical chart, with textile fibres being a bit more stable for imports, which is acceptable as they contribute less than 10% of the category 2 imports. But a considerable spike can be seen for textile fibres imports and metalliferous ores exports in 2021, which could be the increased demand due to the COVID-19 pandemic. These values decrease in the following years.



By observing the raw dollar chart, it is obvious that the profit for metalliferous ores start rising from around 2004, which is around the period of industrial growth. This is also the time when it started to get exported a lot more as shown in the statistical chart. From that time onwards, it has made up more than 1.8 trillion dollars from exports alone as shown in the bar chart.

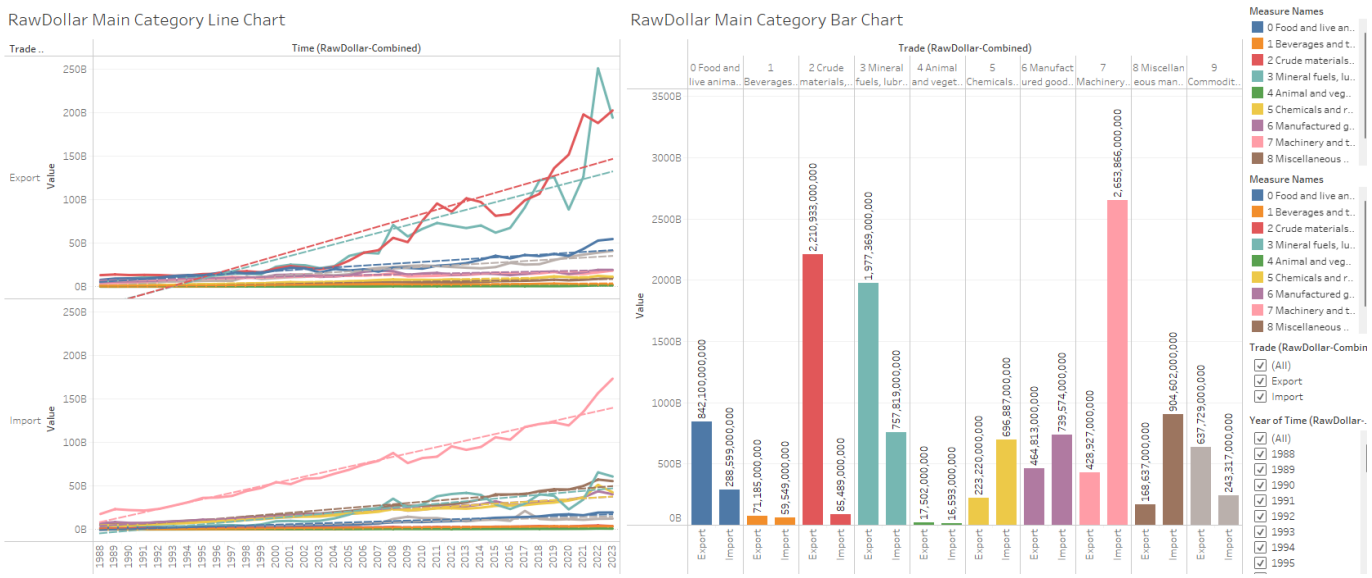
Storyboard for one subcategory and other subcategories

A storyboard based on category 2 and its subcategories is created and explained below.



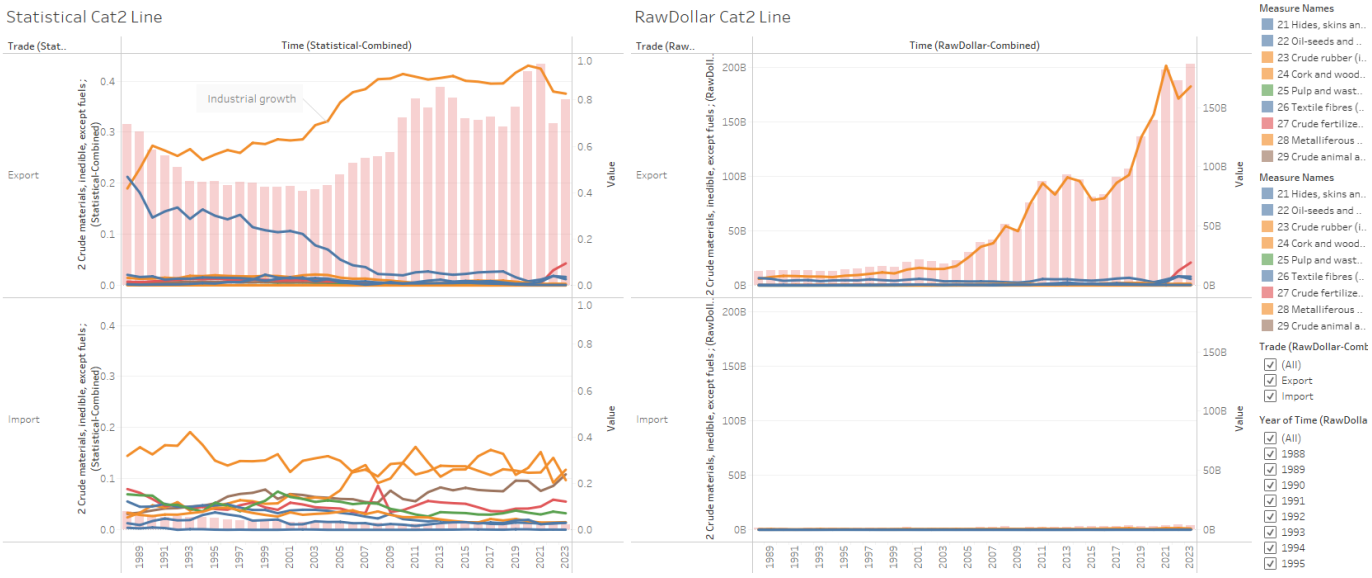
The stacked area chart above shows the percentage that each main category contributes to the import or export. It is apparent that “2 Crude materials, inedible, except fuels” makes up a large part of the exports throughout the years. The export section in the treemap also shows that crude materials are the largest export materials overall, with mineral fuels coming in second.

Other main category charts are drawn further to confirm its significance.



The line chart above shows the raw dollar values of each main category over time. It shows that the crude material category is the second highest in value for exports. But according to the bar chart, we can see that the crude materials category actually sums up to be the highest exported materials than any other export materials.

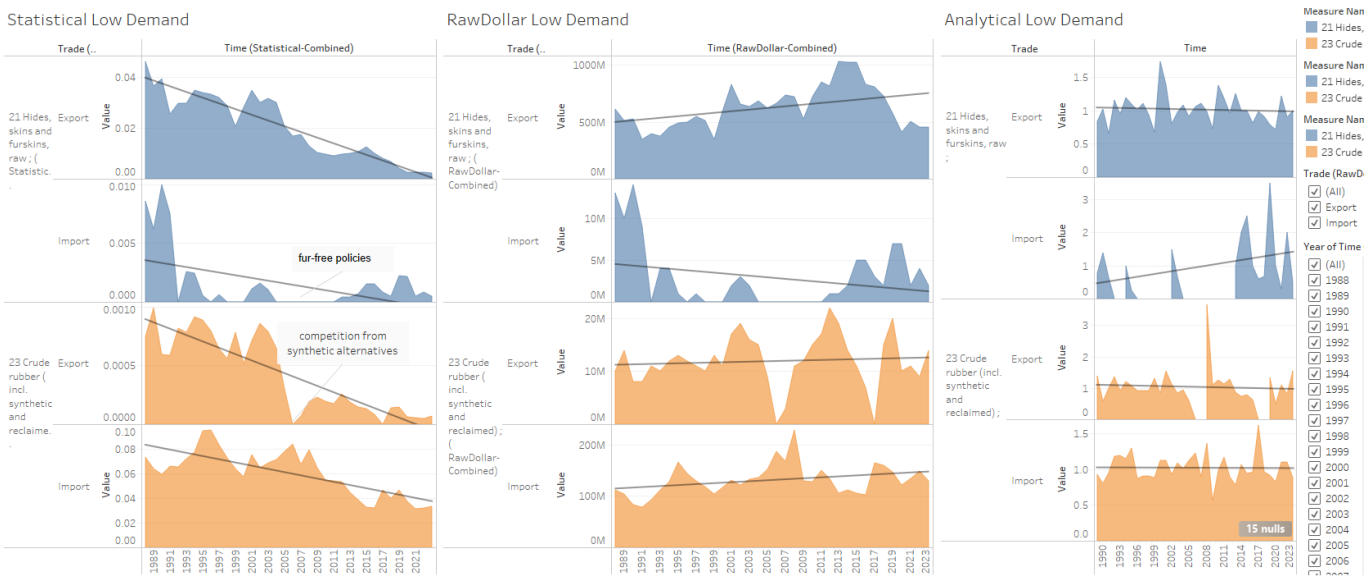
Thus, the crude materials category and its subcategories are chosen for further analysis.



The above line charts show the statistical and raw dollar values of each subcategory of category 2. It is apparent that “28 Metalliferous ores and metal scrap” has the highest value throughout the years for exports for both charts. Thus, this category is further explored.

As mentioned in the dashboard, metalliferous ores exports rose throughout the years, both in terms of statistics and raw dollars while textile fibres exports decrease statistically, possibly due

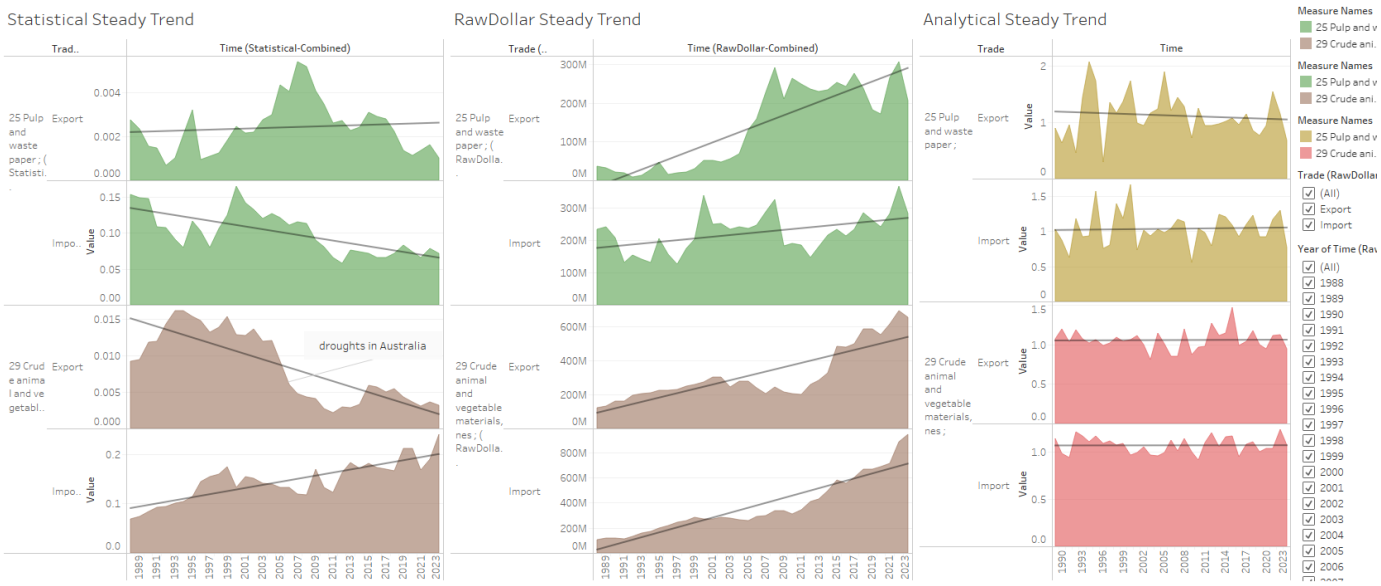
to a decrease in demand or more reliance on domestic fibres. Some discrete demand increases are also seen during 2021 – the covid-19 pandemic era.



The above dashboard shows the hide skins, fur skins and crude rubber metrics. In statical charts, both categories only contribute to less than 5% of the country's imports and exports. While both categories decrease over time for both imports and exports, there were some years when these values dropped to zero. In the longest period of between 2004 to 2011, the country stopped importing hide skins and fur skins possibly due to shifting policies. The country also stopped exporting crude rubber in 2006 and 2017, possibly due to the competition from synthetic alternatives.

While raw dollar charts for both subcategories show fluctuations, hides, skins and fur skins rake in more than 500 million dollars despite its low export percentage.

The analytical charts also show fluctuations with occasional spikes influenced by the stopping and resuming of imports and exports.

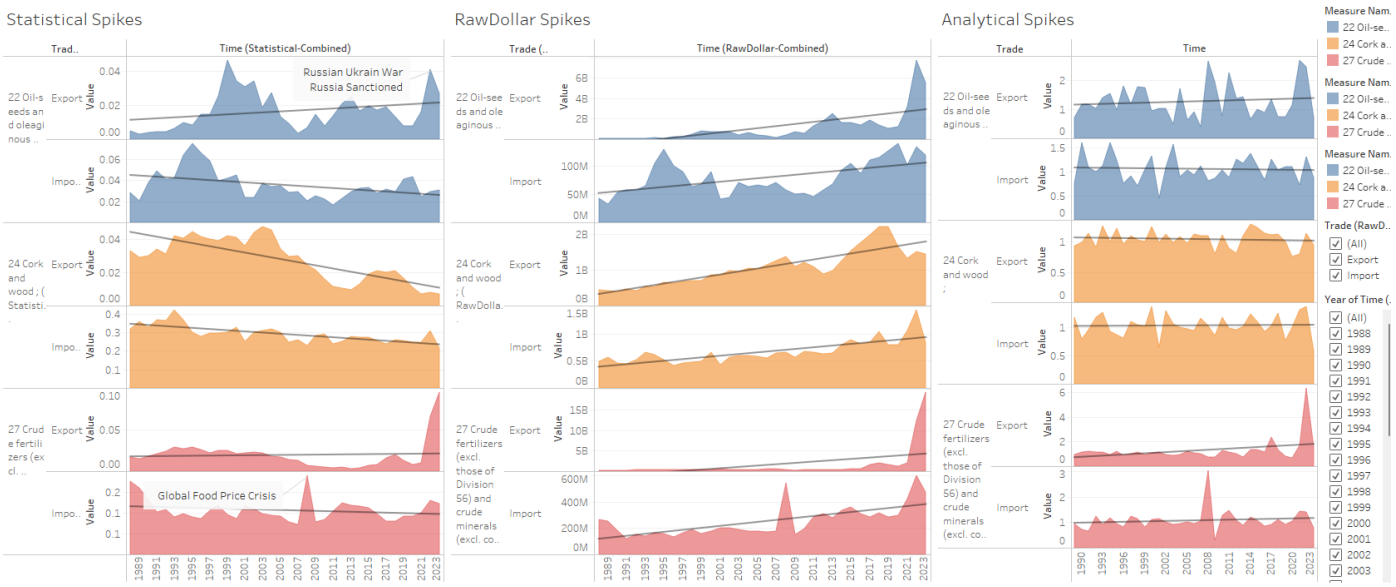


The above dashboard shows the pulp and wastepaper VS crude animal and vegetable materials metrics.

From the statistical charts, we can see that pulp and wastepaper exports increase till 2007 and then gradually decrease again, possibly because of the reduced production due to global financial crisis. The import chart shows a gradual decline throughout the years. The crude animal and vegetable materials show a gradual decline for exports and gradual rise for imports. There is also a notable declination around 2004 to 2011, which could be due to droughts in Australia.

In raw dollar trends, pulp and wastepaper shows significant upward trend for exports, which could be due to the global trend for recycling and sustainable materials. Its import shows a slight upward trend despite its decreasing percentage share which could also indicate its global price increase. This could also be possible for both import and export raw dollar trends for crude animal and vegetable materials, which show a considerable steep slope despite the decreasing export percentage share.

As for the analytical charts, the charts for pulp and wastepaper show a steady trend with only a few spikes. The charts for crude animal and vegetable materials also show a flat trend with only minor fluctuations, indicating that the category has remained unchanged in importance, and reflects a consistent use of these materials despite the declining export value.



The above dashboard shows oilseeds and oleaginous fruits vs cork and wood vs crude fertilizers and crude minerals metrics and how they mainly get affected by extrnal events. For oilseeds and oleaginous fruits, its statistical trends show a slight trend increase in exports and slight trend decrease in imports, but having sharp changes throughout the timeline, which could indicate its susceptibility to external influences such as global food price crisis in 2007-2008. This can also be seen from the almost flat trend but many fluctuations in its analytical charts. Its raw dollar charts show a steady increase in trend with a notable spike in exports, possibly due to the Covid-19 (2020-2021) and Russian Ukraine war (2022).

For cork and wood, both imports and exports in its analytical charts show a flat trend with minor fluctuations, indicating their low importance but stability. Its statistical charts show a steady trend decline and raw dollar charts show a steady trend increase, but with a sharp decline in exports and sharp spike in imports around the Covid-19 and Russian Ukraine war period.

For crude fertilizers, the trends for all three charts are flat to slightly inclined. But it also experiences external influences such as Russian Ukraine war, which can be seen from its spike in all three export charts and raw dollar import chart. A sharp increase in 2008 can also be seen for all its import charts, possibly due to the global food price crisis.

Summary

Findings and key trends

In this analysis, the import and export trends of different subcategories of crude materials were explored using three different data – statistical, raw dollar and analytical to find out the major trends, notable changes and influences on these products.

The graphs showed insights for both trade types and for each subcategory, with statistical charts showing the percentage share over time, analytical charts showing trend stability and raw dollar charts showing monetary growth. The observations showed that metalliferous ores and metal scrap showed the highest trend with the highest raw dollar values in exports, possibly due to their usage in synthetic materials.

The subcategory was also compared to other categories as well. From these results, we see that metalliferous ores bring in the largest profit. It started growing in the early 2000s around the global commodities boom. It also showed a strong correlation with the main category growth, and textile fibres trends in the opposite direction, suggesting a lesser market demand for traditional fibres. Crude fertilizers and crude minerals also showed notable spikes in export charts, particularly around 2008 – global food price crisis and 2022 – Russian Ukraine war, thus sensitive to external crises. The impacts of these crises can also be seen across statistical, analytical and raw dollar charts of different subcategories. Hides, skins and furskins also faced great declines throughout the past with a few instances where they had to be stopped, which occured due to the fashion industry's ethical movements and the growth of synthetic alternatives. The resurgence in 2019 saw its temporary rise but unstable due to the ongoing conflicts.

Recommendations

For this crude materials industry, it is recommended that metalliferous ores and crude fertilizers are focused. This is because metalliferous ores remain the highest export revenue and keep on rising in statistical and raw dollar charts year after year. Although crude fertilizers recently got significantly higher, the trend continues to the following years unlike those affected by the Russian Ukraine war or covid-19. These metrics also prove their resilience and demand growth. Moreover, industries that work with animal hides and furs should start adopting sustainable, synthetic materials into their product lines to adapt to the customer preferences and regulatory bodies.

Advantages and Disadvantages of Dashboard & Storyboard

Advantages

Both dashboards and storyboards can be used to convey a story within the data. Data analysts can group charts from different sources with annotations, texts and highlights in a dashboard for comparison across different data types. In dashboards, layouts can be customized for displaying the most relevant information and their drag-and-drop interface allows users to create dashboards and storyboards easily without deep technical knowledge. Then these dashboards can be shown in an interactive storyboard and create a narrative for clear insights. Colorful visuals, texts and annotations can also be used for engagement and can be shared among members as well.

Disadvantages

As the amount of data to present gets bigger, it becomes more difficult to organize the dashboard, storyboard and convey the insights effectively. Since these dashboards are designed to display tableau formats effectively and users may have difficulties trying to display other formats such as third-party graph methods or live animations. Although it is user-friendly, users still need time to get used to all the functions to effectively display their data. And different scaling factors might make the users misinterpret the data shown if they do not fully understand the chart types. Despite having a canvas to convey a story and providing additional navigation functions, storyboards can be more time-consuming than just simple dashboards.