32146 Assessment Task 3: Applied Data Visualisation

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1.0 Executive Summary

International trade is vital to Australia's economy. It can create jobs and provide opportunities for Australian businesses to expand. The purpose of this report is to provide an in-depth analysis of Australia's import and export international trade, and presented in a dashboard and storyboard format. This dataset comes from more than 30 years of import and export data from the Australian Bureau of Statistics (ABS) between 1988 and 2021, and has information on 10 main categories and 67 subcategories. Each subcategory addresses the performance of multiple industries in terms of productivity and resources.

The 10 main categories are as follows:
0. Food and live animals
1. Beverages and tobacco
2. Crude materials, inedible, except fuels
3. Mineral fuels, lubricants and related materials
4. Animal and vegetable oils, fats and waxes
5. Chemicals and related products, nes
6. Manufactured goods classified chiefly by material
7. Machinery and transport equipment
8. Miscellaneous manufactured articles
9. Commodities and transactions not classified elsewhere in the SITC

Note: The unit of measurement for all data in the dataset is $AU Millions

Through the visualization and in-depth analysis of the dataset, the following main conclusions are drawn:

- In Australia's international trade, both imports and exports show a clear upward trend from 1988 to 2021.
- Since 1988, the value of Australia's imports has increased by 678%, and the value of exports has increased by 981%.
- The record rise in the Australian dollar in 2003 and the reduction in import duties led to a historic surge in total imports during the year.
- In 2014, Australia successively signed free trade agreements with China, South Korea and Japan, and the total export value of all categories increased significantly during the year, with around 190%.
- As of 2021, the total import of Machinery and transport equipment reached $2,376,715 million, however, the total export is much lower in comparison, accounting for only $406,559 million.

- In the import trade, Machinery and transport equipment has always played a dominant role from 1988 to 2021, accounting for almost 40% of the total import trade every year.
- Food and live animals have shown a gradual downward trend over the years, from 18% of the total export trade in 1988 to 9.55% in 2021.
- China accounted for 35% of Australia's total export trade in 2018, with an annual transaction value of US$85 billion.
- Due to the limitations of the Australian market and the greater competitive pressure in foreign markets, Australia's manufacturing industry has not been able to develop well.

2.0 Data Preparation:

Data preparation is a very important initial step before data visualization and analysis. In order to better analyze the trends and breaking points in the dataset, I added statistical (Ratio) and analytical (Yearly Change) pattern for all the main categories and subcategories in the dataset, as follows:

2.1 Statistic Pattern:

The statistical pattern can help to quickly find out the proportion or percentage of each type of commodity in the total import and export every year, thereby importing the understanding of the data.

For main category i=0 to 9, the percentage of each main category can be expressed as:

$$Percentage\_main_{(i-import/export)} = \frac{sub\_total_{(i-import/export)}}{total_{(i-import/export)}} \times 100\%$$

For sub-category j=0 to 9, the percentage of each sub-category can be expressed as:

$$Percentage\_sub_{(j-import/export)} = \frac{d_{(i-import/export)}}{sub\_total_{(i-import/export)}} \times 100\%$$

2.2 Analytical Pattern:

The analytical pattern is used to measure the year-over-year change in a specific category or sub-category. For time series t = 1988, 1989,…,2021, the ratio of yearly change for category(i) or sub-category(j) between t and t-1 can be expressed as:

$$Yearly\_Change = \frac{d_t}{d_{t-1}} \times 100\%$$

Where d is data for category(i) or sub-category(j).

Note：Since 1988 has no data for the last year, its rate of yearly change is 100% (initial data).

2.3 Data Transpose

Due to the lack of information on data category dimensions, Tableau cannot create charts such as tree charts and bubble charts. In order to solve this problem, I transpose the data that needs to be drawn in the category chart in the data, so that the proportion information between different categories can be compared.

3.0 Data Visualization

3.1 Time Series Charts

The figure below shows the analysis pattern of all main categories of Australia's import and export trade from 1988 to 2021. In this time series figure (Refer to Figure1), I used different types of charts (such as line charts, column charts and polygon charts) displays the yearly changes of all main categories, which makes it easier for the audience to compare the yearly changes of different categories.
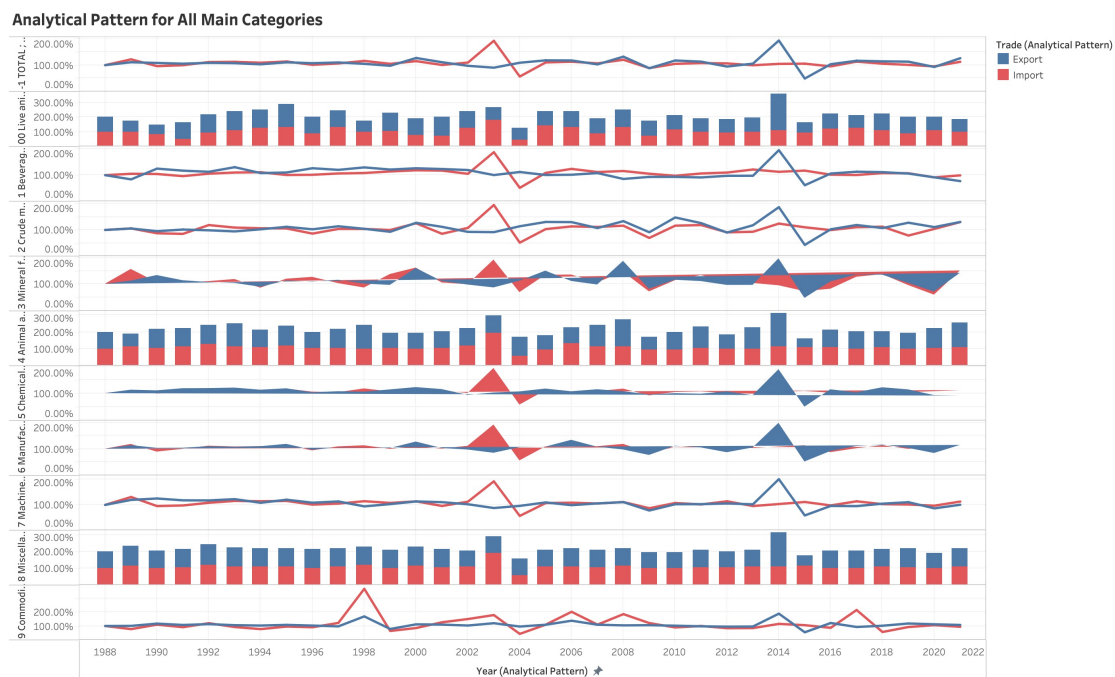

Figure 1 # Analytical Pattern for All Main Categories(Yearly change)

By comparing the import and export changes of all major categories, it can be found that almost all major categories have similar change fluctuations between 1988 and 2021. In 2003, almost all major categories of import trade had a strong increase, with an increase of about 190% compared with the previous year. According to Gregory (2012), the author pointed out that the significant increase in Australia's import trade in 2003 was mainly due to the rapid development of the Australian economy and the appreciation of the Australian dollar

exchange rate. In this year, the Australian exchange rate soared by 33% against the US dollar, and it was also the strongest year for the Australian exchange rate since the mid-20th century (Atkin et al., 2021). However, there was a slight drop in Australian exports during the year, also due to a record rise in the exchange rate and domestic supply constraints (AGT, 2004). Unlike the other categories, Category 9 (commodities and transactions not classified elsewhere in SITC) did not see a significant increase in 2003. In contrast, imports of this category experienced a historic surge in 1998, increasing by 367.39% compared to the previous year. The main contributor to this was non-monetary gold, which soared from 796 million in 1997 to 3,174 million in 1998. The main reason behind this is the increase in the amount of gold used for refining and re-export in Australia (Andrew, n.d.).

In addition, there was also a marked increase in export trade in all categories in 2014. Especially for food and live animals, its total exports increased by 247.1% compared to 2013. The main reason behind this is that Australia signed free trade agreements with China, South Korea and Japan in 2014. This agreement allowed Australia to have unrestricted goods and trade with these countries and greatly reduced tariffs, allowing Australia's free trade to be greatly expanded during the year (Nunez, 2019).

Figure 2 # Statistical Pattern for All Main Categories(Ratio)

Another time series graph analyzes the proportion of all main categories from 1988 to 2021. As shown in the figure above (Refer to Figure 2), it is still a collection of three different types

of charts: line chart, column chart and polygon chart. The top line chart shows how Australia's total imports and exports have changed over the past 33 years. It can be found that there is an upward trend in general and total exports and total exports are very close except for the two peaks mentioned earlier. In addition, in this time series graph, it can also be found that the proportion of exports of some major categories is much larger than the proportion of imports, such as "0 Food and live animals", "2 Crude materials, inedible, except fuels" and other categories. In contrast, the proportion of imports in categories such as "5 Chemicals and related products" and "7 Machinery and transport equipment" accounted for the major part.

3.2 Interactive Charts

Interactive charts allow users to change what the chart displays by taking action. Users can interact with the chart by scrolling, hovering, or using buttons or tabs. Essentially, interactive data visualization has advantages over static data representation because it provides tools to interact with information displayed in real-time, allowing viewers to see more details, generate new insights and questions, and draw more insights from the data. Valuable and potential information.

The first interactive chart is a bubble chart, which can clearly show what are the largest sources of Australia's export and import trade from 1988 to 2021 (Refer to Figure 3). The size of the bubble is based on the total amount of import and export trade, and different colors represent different trades. On the right side of the bubble chart, we can also select the range of years to be observed or the situation of a specific year by dragging the slider. In this bubble chart, it can be found that "Machinery and transport equipment" accounts for the largest share in the import trade. The total import value in these 33 years exceeded 2386 billion. In contrast, "Animal and vegetable oils, fats and waxes" accounted for the smallest proportion of total imports, only 14.8 billion. In the export trade, "Crude materials, inedible, except fuels" and "Mineral fuels, lubricants and related materials" account for the vast majority. However, it is impossible to see the specific changes between them in this bubble chart, so I created a line chart and an area chart for further analysis and observation.
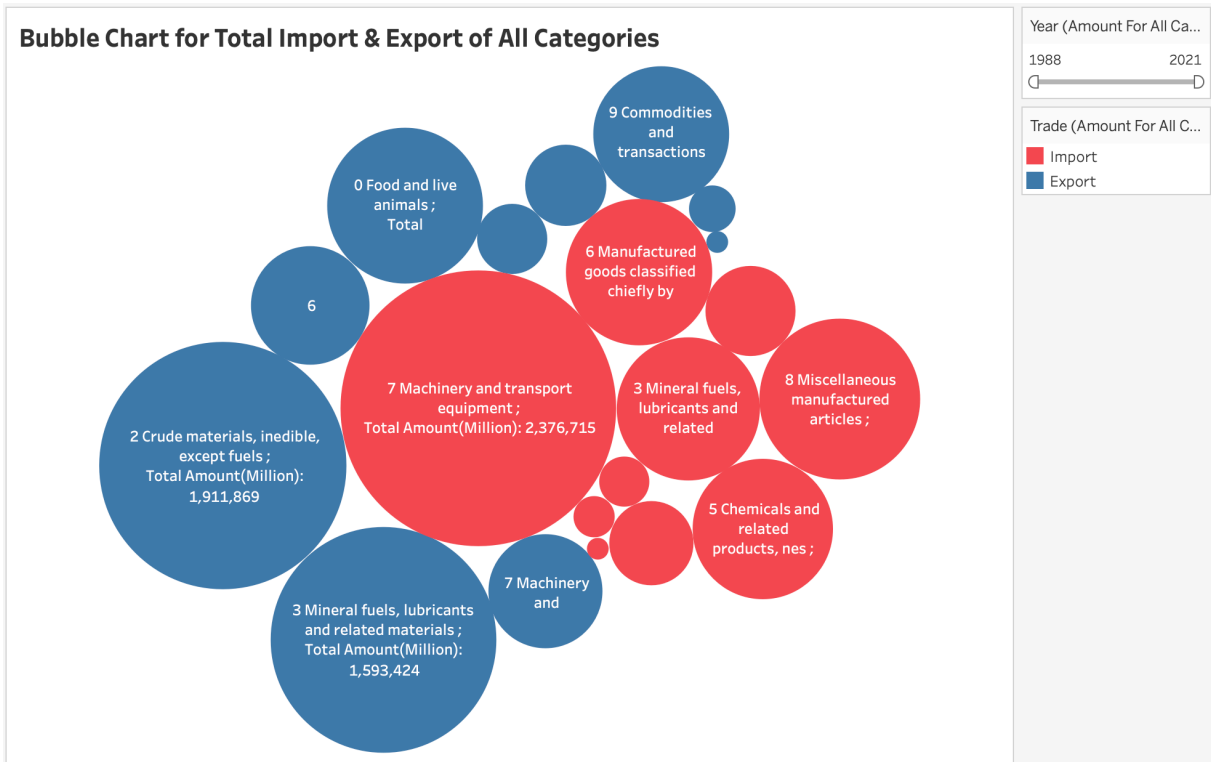
Bubble Chart for Total Import & Export of All Categories

9 Commodities and transactions

0 Food and live animals ; Total

6

6 Manufactured goods classified chiefly by

7 Machinery and transport equipment ; Total Amount(Million): 2,376,715

3 Mineral fuels, lubricants and related

8 Miscellaneous manufactured articles ;

2 Crude materials, inedible, except fuels ; Total Amount(Million): 1,911,869

5 Chemicals and related products, nes ;

3 Mineral fuels, lubricants and related materials ; Total Amount(Million): 1,593,424

7 Machinery and

Year (Amount For All Ca...
1988   2021

Trade (Amount For All C...
■ Import
■ Export

Figure 3 # Bubble chart for Total Import & Export of All Main Categories

The first is for import trade, as shown in the figure below (Refer to Figure 4), it can be found that 7 "Machinery and transport equipment" has always dominated the import trade from 1988 to 2021, accounting for almost every year of the total import trade. of about 40%. This also seems to explain Australia's strong dependence on machinery manufacturing. According to Crittenden (2020), the author also mentioned that since 1970, there has been a certain decline in the manufacturing industry in Australia. Local manufacturers cannot compete with imported goods, and imported goods are much cheaper than Australian-produced goods (Crittenden, 2020). By contrast, the proportion of "Animal and vegetable oils, fats and waxes" in the import trade is always the least, with an average of about 0.3%. This just shows that Australia's demand for "animal and vegetable oils, fats and waxes" is not large or self-sufficient, so its demand for imports is very low. In addition, some categories such as "Mineral Fuels, Lubricants and Related Materials" can be found to vary erratically. Since 1988, the proportion of imports in this category has been rising in fluctuations and peaked in 2013, accounting for 17.51% of the total. However, it dropped sharply to 9.28% during 2013-2016.
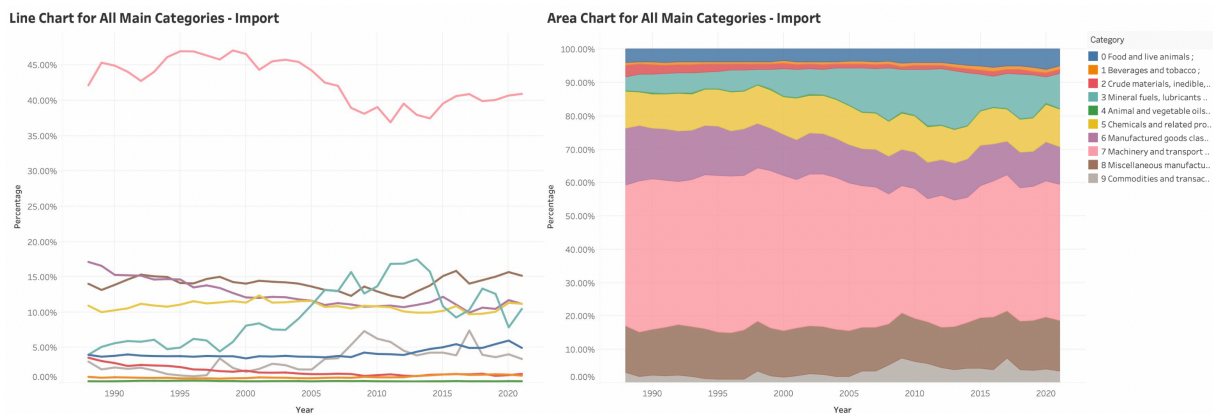
Figure 4 # Import Percentage for All Main Categories

The other is to visualize and analyze the proportion of Australia's ten main categories of export trade. As shown in the figure below (Refer to Figure 5), in Australia's export trade, it can be found that Crude materials, inedible, except fuels basically occupy a dominant position. Although there was a large fluctuation during this period, the overall trend is still an upward trend. Especially after 2018, its share of total exports rose sharply from 30.99% to 43.18% in 2021. According to Crittenden (2021), the authors point out that this increase is mainly due to the sharp increase in the price of ore in international trade. According to statistics, the price of iron ore has soared from US$69.75/ton in 2018 to US$161.71/ton in 2021 (STD, 2022). Similarly, the overall export trade of mineral fuels, lubricants and related materials is also on an upward trend. It surpassed Crude materials many times throughout the period, and inedible, except fuels became the category with the highest export proportion at that time, especially accounting for 35.49% of the overall export trade in 2018. However, after 2018, the share of this category dropped sharply to 24.68% in 2020. This is mainly due to the health and environmental impacts of coal use and competition from cheap natural gas, which has led to a reduction in the use of fossil fuels (Nunez, 2020).

In addition, food and live animals seem to show a gradual downward trend over the years, from 18% of the total export trade in 1988 to only 9.55% in 2021. However, this is mainly due to the voices of some groups against the export trade of live animals. RSPCA (2020) states that exporting live animals for slaughter is inherently high risk. Because of the unbearable conditions on board, millions of sheep and cattle suffered needlessly during the live export process. Evidence of suffering and cruelty in transport of live animals has emerged repeatedly over the decades, so the export of live animals should be phased out (RSPCA, 2020). However, the ban has not been implemented, but ensures that live animals exported from Australia can only be slaughtered in approved facilities. In addition, some categories have consistently maintained a low export share such as: "Beverages and tobacco", "Animal and vegetable oils,

fats and waxes". Especially for "Animal and vegetable oils, fats and waxes", its proportion in Australia's total export trade is the lowest, which remains around 0.2% all year round.
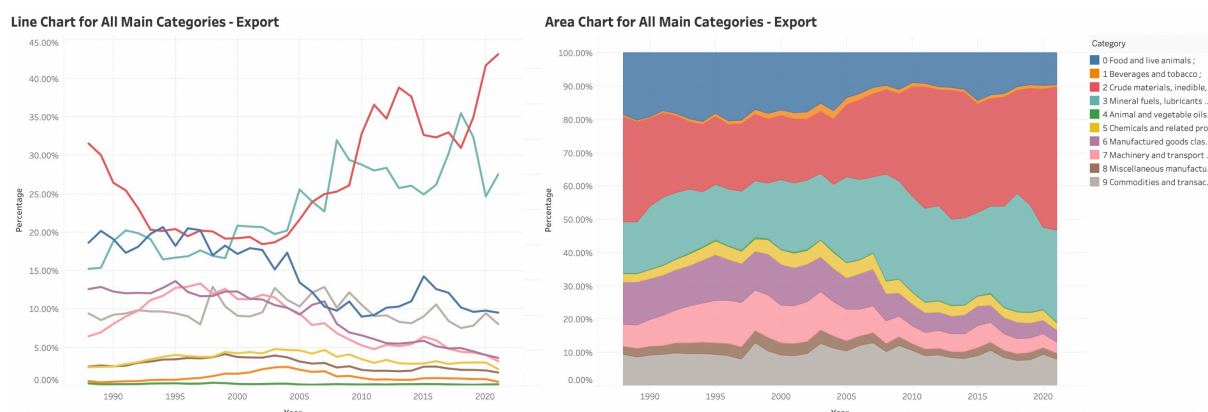

Figure 5 # Export Percentage for All Main Categories

3.3 Visual Dashboard

From 1988 to 2021, Australia's annual import trade of machinery and transport equipment has dominated. As of 2021, Australia's import trade of machinery and transport equipment has reached $135,107 million (ABS, 2021). To further explore and analyze the key trends and changes in this category in terms of imports and exports, here is an in-depth exploration of the data for key category 7 – "Machinery and transport equipment" using dashboard visualizations.

Below are the 9 subcategories of "Machinery and transport equipment":

71 Power generating machinery and equipment

72 Machinery specialized for particular industries

73 Metalworking machinery

74 General industrial machinery and equipment, nes, and machine parts, nes

75 Office machines and automatic data processing machines

76 Telecommunications and sound recording and reproducing apparatus and equipment

77 Electrical machinery, apparatus and appliances, nes, and electrical parts thereof (incl. non electrical counterparts, nes, of electrical household type equipment)

78 Road vehicles (incl. air-cushion vehicles)

79 Transport equipment (excl. road vehicles)

Dashboards are collections of multiple views that combine multiple different types of visualizations into one place, allowing viewers to view and compare different visualizations at the same time. The dashboard I created here consists of five charts. Refer to the following (Refer to Figure 6):

Dashboard 1: Changes and Trends in Machinery and Transport Equipment in Australia

Machinery and Transport Equipments - Data Table Changes

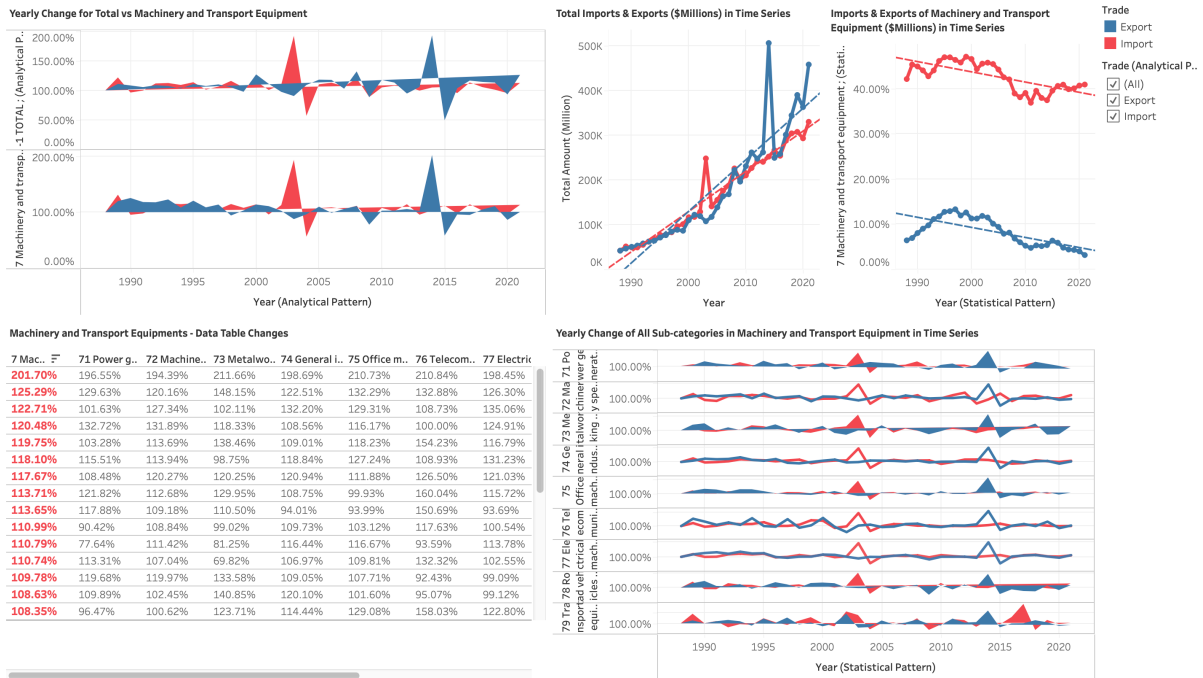| 7 Mac..	71 Power g..	72 Machine..	73 Metalwo..	74 General i..	75 Office m..	76 Telecom..	77 Electric..
201.70%	196.55%	194.39%	211.66%	198.69%	210.73%	210.84%	198.45%
125.29%	129.63%	120.16%	148.15%	122.51%	132.29%	132.88%	126.30%
122.71%	101.63%	127.34%	102.11%	132.20%	129.31%	108.73%	135.06%
120.48%	132.72%	131.89%	118.33%	108.56%	116.17%	100.00%	124.91%
119.75%	103.28%	113.69%	138.46%	109.01%	118.23%	154.23%	116.79%
118.10%	115.51%	113.94%	98.75%	118.84%	127.24%	108.93%	131.23%
117.67%	108.48%	120.27%	120.25%	120.94%	111.88%	126.50%	121.03%
113.71%	121.82%	112.68%	129.95%	108.75%	99.93%	160.04%	115.72%
113.65%	117.88%	109.18%	110.50%	94.01%	93.99%	150.69%	93.69%
110.99%	90.42%	108.84%	99.02%	109.73%	103.12%	117.63%	100.54%
110.79%	77.64%	111.42%	81.25%	116.44%	116.67%	93.59%	113.78%
110.74%	113.31%	107.04%	69.82%	106.97%	109.81%	132.32%	102.55%
109.78%	119.68%	119.97%	133.58%	109.05%	107.71%	92.43%	99.09%
108.63%	109.89%	102.45%	140.85%	120.10%	101.60%	95.07%	99.12%
108.35%	96.47%	100.62%	123.71%	114.44%	129.08%	158.03%	122.80%

Figure 6 # Dashboard 1- Changes and Trends in Machinery and Transport Equipment in Australia

As shown in the figure above, the first graph in the upper left corner is composed of two polygons, which respectively show the yearly change of the total import and export value and the yearly change of the import and export of "Machinery and transport equipment". Overall, the changes in Machinery and transport equipment and the overall import and export time series are very similar, especially for 2003 and 2014. In 2003, Australia's total imports and total imports of "Machinery and transport equipment" both increased by around 193%. In 2014, there was also a larger increase in their total export value. However, there are also some differences between them. During this 33-year period, whether for the total import value or the export value, it has a varying degree of upward trend in the yearly rate of change. That is to say, its growth has a certain exponential rise. However, for Machinery and transport equipment, the increase in its yearly rate of change does not seem to be so obvious, especially for its exports. Although its yearly rate of change in the previous ten years was larger than that of total imports, it remained at 100%.

In the upper right corner of the dashboard are two line graphs. The line chart on the left shows the changes in the total import and export volume from 1988 to 2021 (US$ million), and the line chart on the right shows the changes in the proportion of "Machinery and transport equipment" imports and exports in the total imports and exports. From the line chart on the left, it can be seen that not only did two large increases occur in 2003 and 2014, but Australia's total import and export trade also experienced a significant increase during the 33-year period,

and this trend is still increasing. According to DFAT (2019), the author mentioned that Australia's import and export trade has also been significantly improved with the cooperation with Asian markets. Especially for China, which accounted for 35% of Australia's total export trade in 2018, with an yearly transaction value of up to US$85 billion (DFAT, 2019).

However, although Australia has a larger increase in international trade transactions, the overall import and export trade of "Machinery and transport equipment" shows a downward trend. Especially for its export share, as of 2021, the export value of "Machinery and transport equipment" only accounts for 3.23% of the total export value. It is worth considering that before 1997, its export share is showing an upward trend. Scales (2017) mentioned that in Australia from 1960 to the early 1980s, the government encouraged local producers to enter the full-scale manufacturing industry, and the government also provided greater assistance to the industry. However, due to the limitations of the Australian market and the greater competitive pressure from foreign markets, Australia's manufacturing industry has not been able to develop very well (Scales, 2017). This further explains why although the import value of "Machinery and transport equipment" fluctuates greatly, its proportion in total imports has always maintained a large share.

In addition, in the data table in the lower left corner, we can view the changes and years in each subcategory of "Machinery and transport equipment" in tabular form, and by selecting ascending or descending order, we can quickly view the year with the largest variation in each subcategory and category, etc. The chart in the lower right corner shows the yearly change of each subcategory in "Machinery and transport equipment" in the form of line and polygonal graphs, allowing us to analyze the impact of each subcategory on the total import and export of the parent category. In addition, an interactive filter has been added to the dashboard, which allows viewers to quickly view the categories of import and export trade in the dashboard, as shown in the image below.
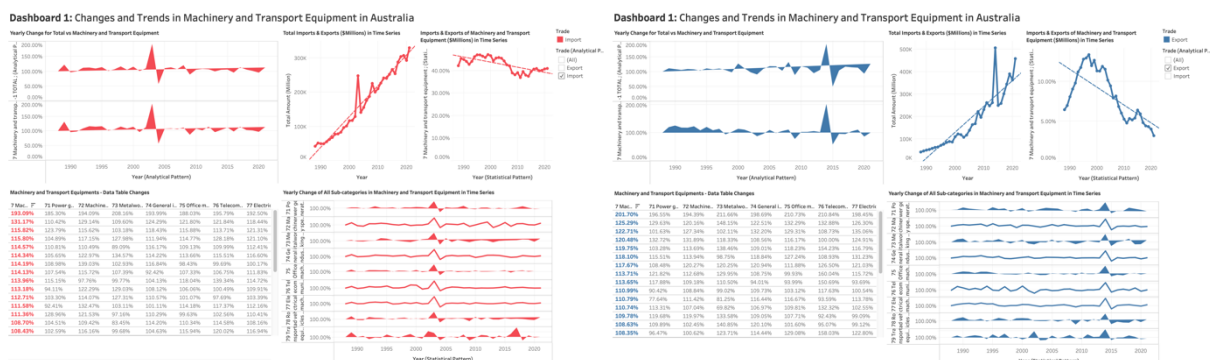

Figure 7 # Dashboard 1-Quick view of import and export trade

In order to better observe and compare the trends between subcategories, I created two line charts in the second dashboard to observe the change in the proportion of subcategories from 1988 to 2021, and two The treemap is used to view the proportion of imports and exports between all subcategories (Refer to Figure 8).
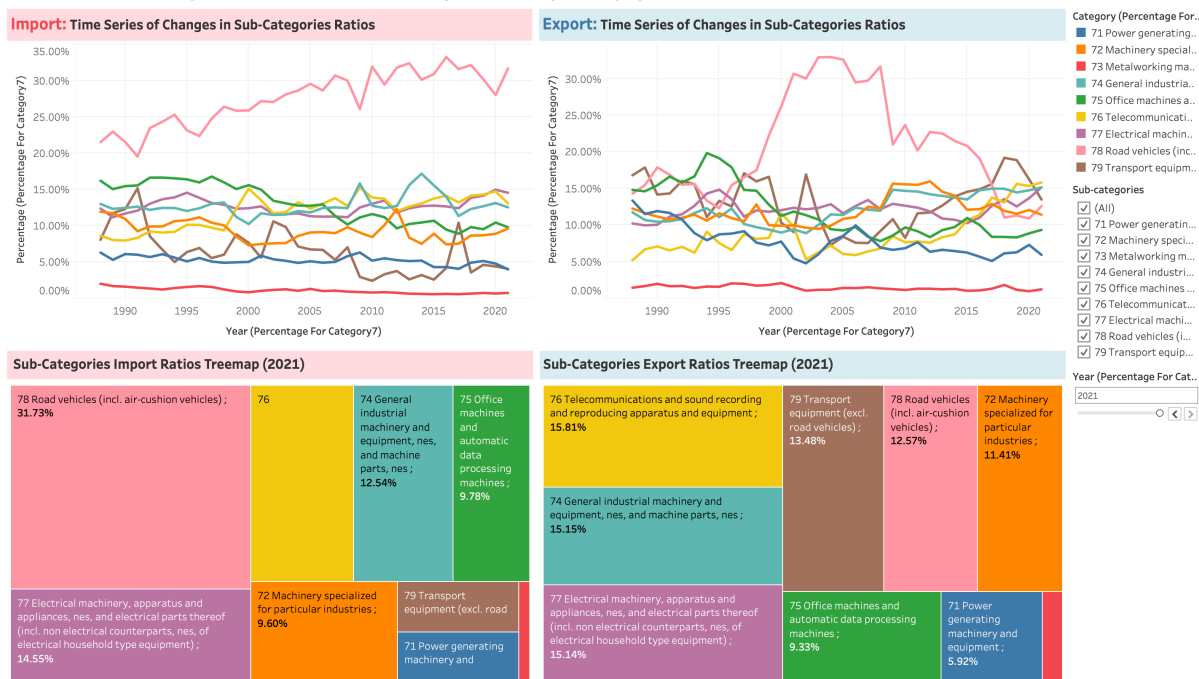

Figure 8 # Dashboard 2- Changes and trends in Machinery and transport equipment trade in Australia

The first time series graph in the upper left corner is the change in the proportion of all subclasses in Machinery and transport equipment. First of all, it can be seen from the figure that "78 Road vehicles" is the sub-category with the highest proportion in the total import of Machinery and transport equipment, rising from 21.54% in 1988 to 31.73%, and this proportion shows a continuing upward trend . However, there is a huge fluctuation in the share of "78 Road vehicles" in its total exports. It is worth noting that "75 Office machines and automatic data processing machines" used to be the second largest sub-category in the total import of machinery and transport equipment, but this proportion has been declining over the years, from 16.21% in 1988 down to 9.78% in 2021. In addition, "73 Metalworking machinery" is the sub-category with the lowest proportion in both imports and exports, and there is a slight decrease in the proportion of imports of "73 Metalworking machinery".

As of 2021, it can be found that the total import of Machinery and transport equipment has reached $2,376,715 millions, while the total export value is much lower, accounting for only $406,559 millions (Refer to Figure 9). "78 Road vehicles" is the subcategory with the largest

share of the total import of Machinery and transport equipment, with $42,874 millions. Followed by "77 Electrical machinery, apparatus and appliances, nes, and electrical parts thereof", with $19,656 millions. Of the total exports of all sub-categories in transport equipment, "76 Telecommunications and sound recording and reproducing apparatus and equipment" was the largest export in the Machinery and transport equipment category, with 2,336 million. Interestingly, the export quotas for "74 General industrial machinery and equipment, nes, and machine parts, nes" and "76 Telecommunications and sound recording and reproducing apparatus and equipment" are quite similar, at $2,238 million and $2,237 million, respectively.
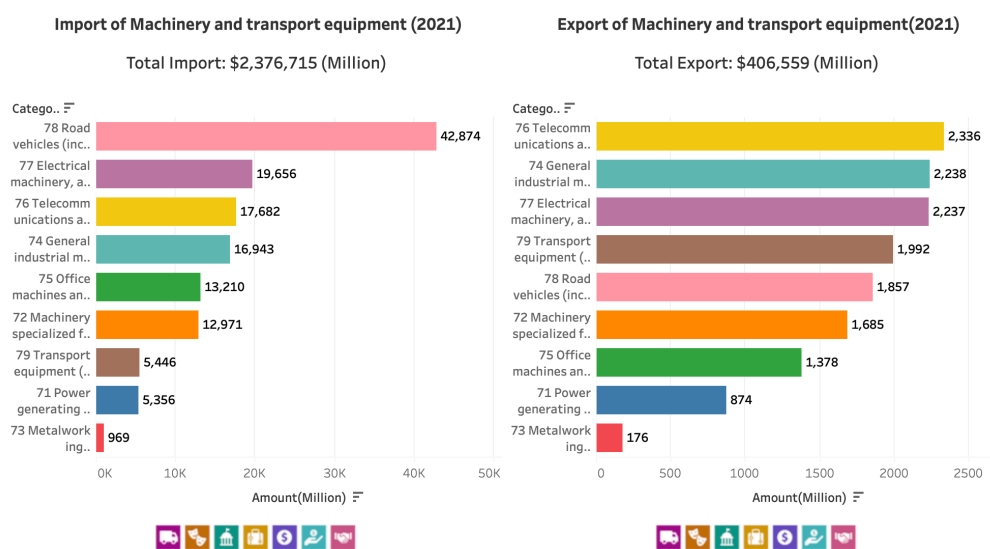
Figure 9 # Import & Export of Machinery and Transport Equipment

4.0 Data Storytelling

A storyboard in Tableau is a sheet that contains a series of sheets or dashboards that work together to convey information. Each sheet or dashboard in a storyboard is called a story point. It narrates through data, provides context, and delivers a compelling message to the audience in the form of storytelling. The storyboard created here consists of five story points:
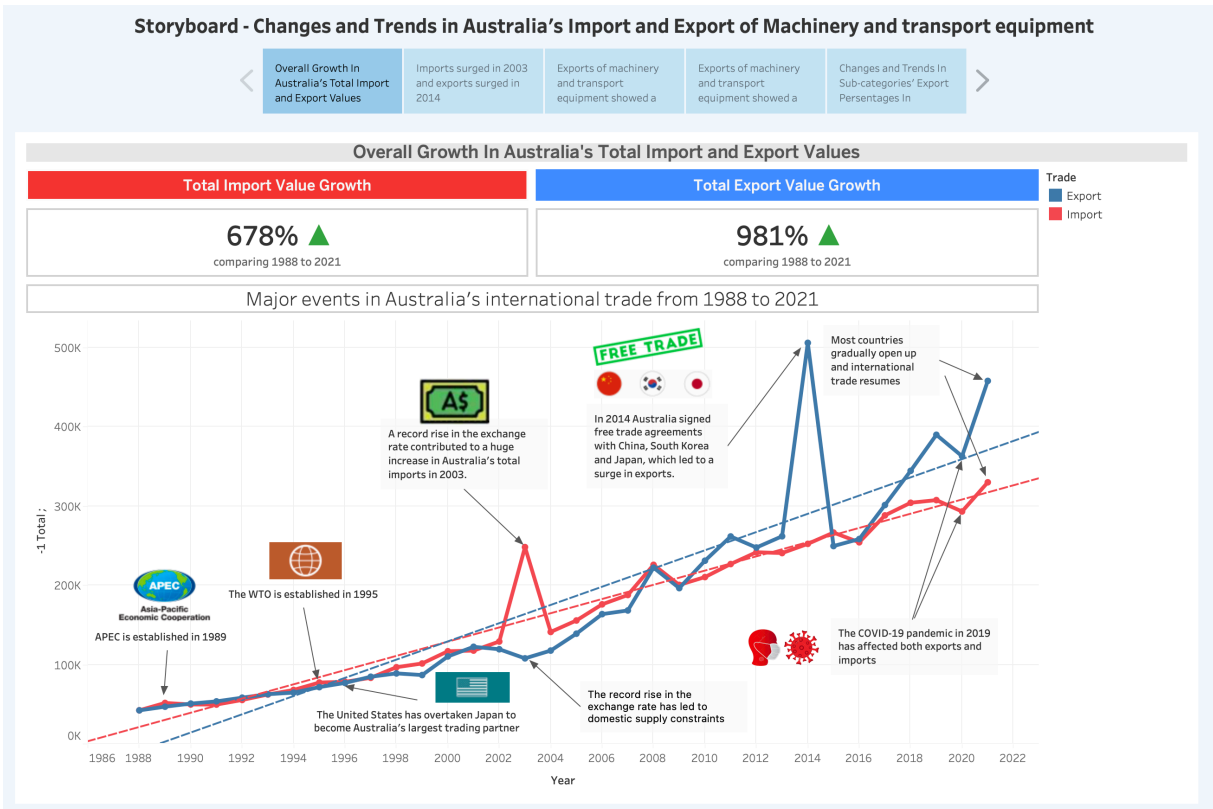
Figure 10 # Story 1- Overall Growth In Australia's Total Import and Export Values

As shown in the figure above (Refer to Figure 10), the first story describes the overall growth in the value of Australia's exports and imports and major events in Australia's international trade between 1988 and 2021. First, since 1988, Australia's imports have grown by 678%, and exports have grown by 981%. This can also be found in the line chart, which clearly shows the overall upward trend of total imports and exports between 1988 and 2021. In addition, some major events along the entire timeline of Australia's international trade are depicted with some icons and markers added to the line chart. For example, the record appreciation of the Australian dollar in 2003, and the reduction of import duties, stimulated consumption of imported goods. This led to a historic surge in total imports during the year. In 2014, Australia successively signed free trade agreements with China, South Korea and Japan, resulting in a sharp increase in total exports. Especially for China's exports, China has become Australia's largest partner in international trade in recent years (DFAT, 2021).
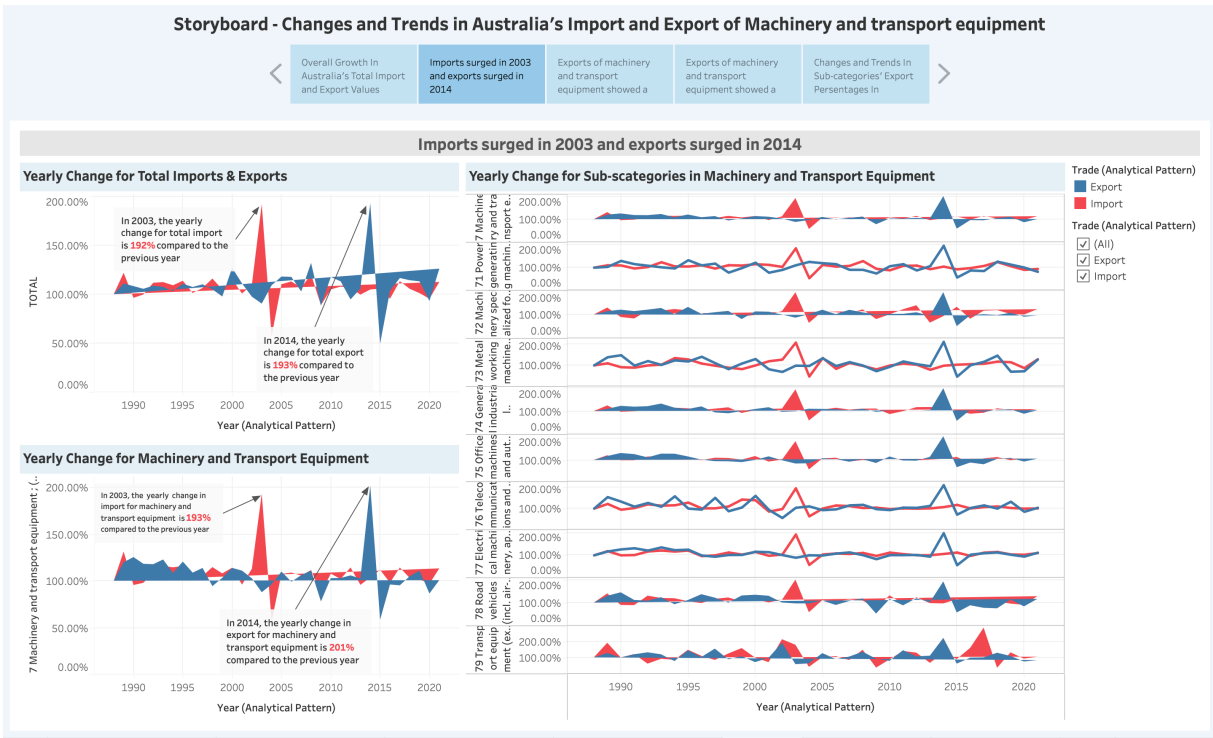
Figure 11 # Story 2- Yearly Change for Both Total and Sub-categories

The second story point is to visualize and compare the yearly changes of overall imports and exports with the yearly changes of imports and exports of all subcategories of Machinery and transport equipment. As shown in the above figure (Refer to Figure 11), it is clear that two important trade worlds in 2003 and 2014 had a large impact on the output of Machinery and transport equipment and all its subcategories. The percentage change between imports in 2003 and exports in 2014 is very large for all subcategories. It is worth noting, however, that total exports of machinery and transport equipment have a larger yearly change than total exports. The total import value of "79 Transport equipment (excluding road vehicles)" also had very large changes between 2002 and 2017. Especially for 2017, the total import value of "79 Transport equipment (excluding road vehicles)" compared to 2016 reached 285.59%.
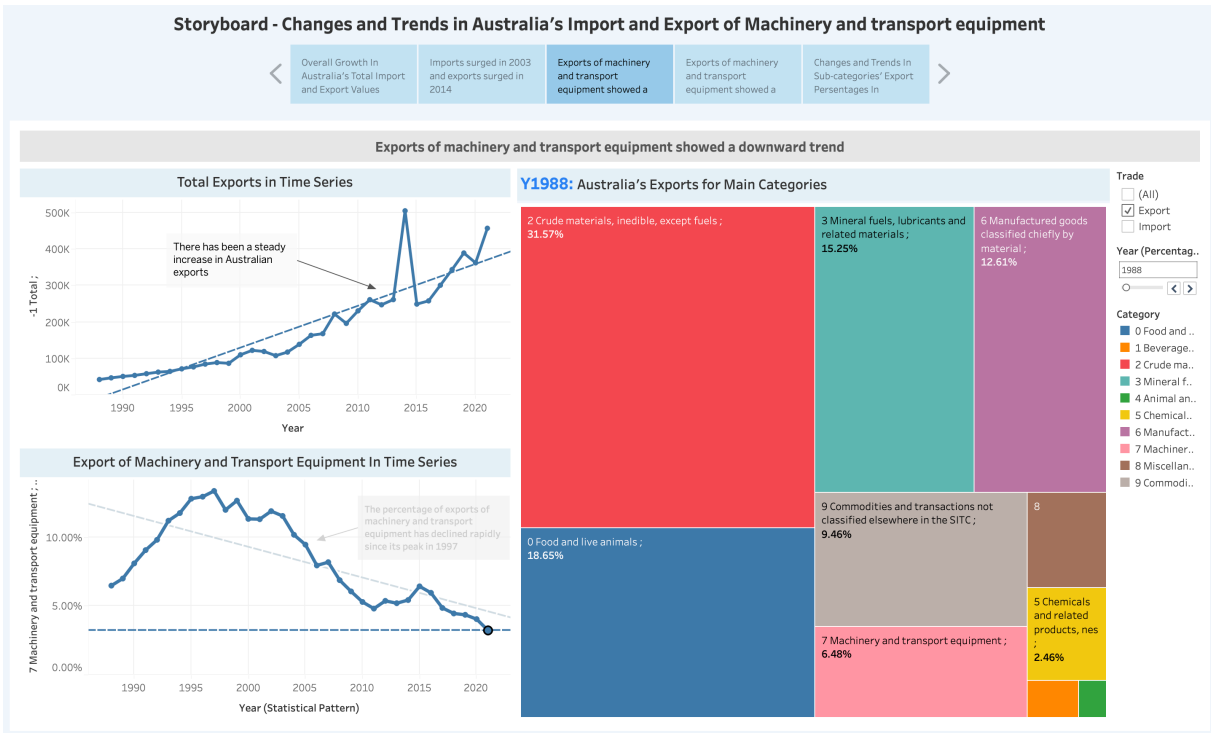
Figure 12 # Story 3- Total Exports & Machinery and Transport Equipment in Time Series

The third story point shows the relationship between total exports and exports of machinery and transport equipment, and the changes in the different shares in Australia's main categories. As shown in the above figure (Refer to Figure 12), it is obvious that the overall export volume is showing a steady upward trend. However, as mentioned before, the export proportion of machinery and transportation equipment was on the rise in 1997, and this The magnitude of the change is larger than the overall export change. However, after peaking in 1997, it declined rapidly. By 2021, the export of machinery and transport equipment will only account for 3.23% of the total export value. The main reason behind this is also the recession caused by the small local market of Australia's automobile manufacturing industry and the high competitive pressure in foreign markets (Scales, 2017). The tree diagram in the dashboard also clearly shows the relationship between each main category and total exports. In addition, by dragging the year slider, viewers can see the changes in the proportion of the entire export over time, making the story more interactive.
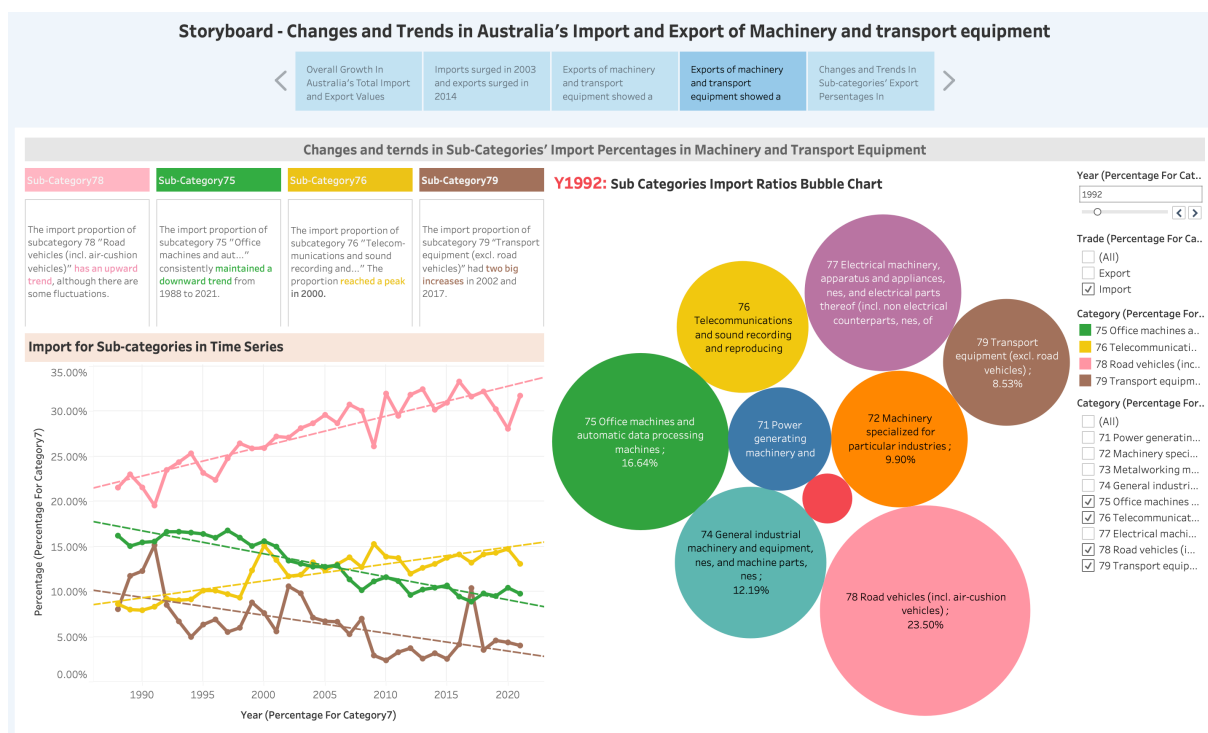
16

Figure 13 # Story 4- Changes and trends in Sub-Categories' Import Percentages in Machinery and Transport Equipment

The fourth story point focuses on changes and trends in the import share of subcategories. As shown in the figure above (Refer to Figure 13), four subcategories with more characteristics are selected here, and text is added to further enhance the understanding and analysis of key points. For example: the import ratio of subcategory 78 "road vehicles (including air-cushion vehicles)" has always maintained an upward trend. As of 2021, this proportion is more than 30% of the total imports of Machinery and transport equipment, and it is also the subcategory with the highest proportion of Machinery and transport equipment imports. According to OEC (2020), the author also mentioned that cars are Australia's largest import product. In 2019, Australia imported 1.1 million road vehicles, and the total import value of road vehicles reached 37.3 billion (ABS, 2021). It also reflects Australia's reliance on imported cars from other countries. In contrast, subcategory 75 "Office machines and automatic data processing machines" and subcategory 79 "Transport equipment (excl. road vehicles)" both showed a more obvious downward trend. Especially for the subcategory 75 "Office machines and automatic…", it has dropped from 16.21% in 1988 to 9.78% in 2021. In addition, the bubble chart on the right visually shows the changes in the proportion of each subcategory to the total import value of Machinery and transport equipment. We can drag the time bar to see the change of the proportion of time, so as to add more interactivity for the audience.
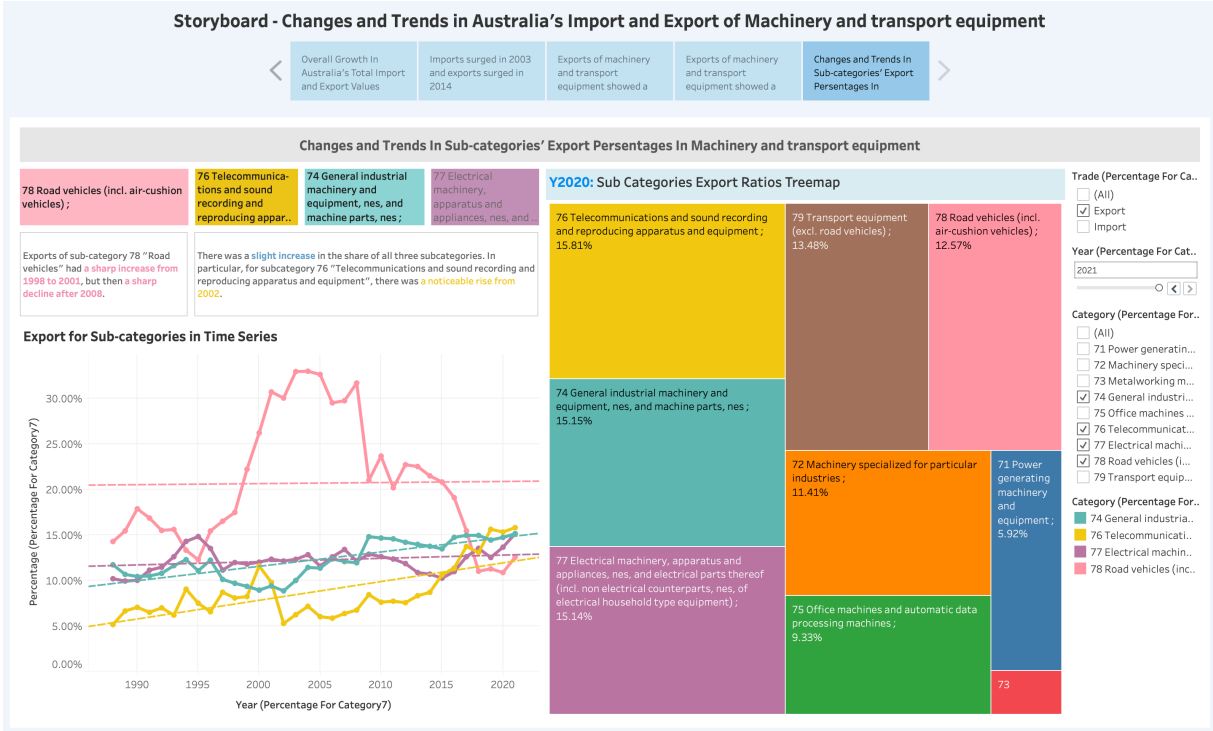
17

Figure 14 # Story 5- Changes and trends in Sub-Categories' Export Percentages in Machinery and Transport Equipment

The main focus of the last story will focus on the changes and trends in the export share of the Machinery and transport equipment sub-category. As shown in the figure above (Refer to Figure 14), it can be first found that as of 2021, sub-category 76 "Telecommunications and sound recording and reproducing apparatus and equipment" is the largest contributor in the export of Machinery and transport equipment. However, it accounted for only 5.17% of Machinery and transport equipment exports in 1988. Similarly, "74 General industrial machinery and equipment, nes, and machine parts, nes" and "76 Telecommunications and sound recording and reproducing apparatus and equipment" both have a slight increase and will exceed the share of exports in 2021. 15%. It is worth noting that exports of sub-category 78 "Road vehicles (incl. air-cushion vehicles)" increased substantially from 1998 to 2001, but declined sharply after 2008. However, the reason behind this is mainly due to the limitations of the Australian market and the greater competitive pressure in foreign markets, which has led to the rise and fall of the Australian auto manufacturing industry (Scales, 2017).

5.0 Summary: Dashboard & Storyboard

Dashboards can bring together multiple worksheets into a single interface, which can provide viewers with a comprehensive overview of many different types of charts to provide more valuable trends and breakthroughs. For example, with the first dashboard we created earlier, viewers can visually see the changes between the main category and the overall import and export and compare them. And in the second dashboard, viewers can not only view the overall time series analysis chart, but also view the proportion of different categories in a specific year. In addition, the layout of the dashboard has a high degree of freedom, and we can customize the form that can best express the characteristics of the data according to different project requirements. Finally, dashboards are more interactive. Viewers can view and select data of interest for deeper information by using filters or sliders.

For storyboards, it tells data in the form of creating stories, providing context and presenting insights to the audience. The purpose of a storyboard is not just to visualize the data, but to make a convincing case based on key information obtained from the data. The fundamental difference between storyboards and dashboards is that dashboards describe trends, patterns, and changes in visualizations, but they don't explain why they're actually happening. Storyboards, however, can present findings across the data as a single story. There are not only changes and trends, but also the reasons and stories behind them, so that the audience can truly understand and be convinced of the insights from the data. The storyboard is also more like a "slideshow", with an introductory story title, description tags, and emphasis on the most valuable information in the story. The whole storyboard allows the audience to understand the whole story from shallow to deep over time.

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6.0 Findings and Recommendation

The following insights and conclusions emerged from the analysis of 33 years of import and export data on Australia's international trade:

- In Australia's international trade, both imports and exports show a clear upward trend from 1988 to 2021.

- Since 1988, the value of Australia's imports has increased by 678%, and the value of exports has increased by 981%.

- The record rise in the Australian dollar in 2003 and the reduction in import duties led to a historic surge in total imports during the year.

- In 2014, Australia successively signed free trade agreements with China, South Korea and Japan, and the total export value of all categories increased significantly during the year, with around 190%.

- As of 2021, the total import of Machinery and transport equipment reached $2,376,715 million, however, the total export is much lower in comparison, accounting for only $406,559 million.

- In the import trade, Machinery and transport equipment has always played a dominant role from 1988 to 2021, accounting for almost 40% of the total import trade every year.

- Food and live animals have shown a gradual downward trend over the years, from 18% of the total export trade in 1988 to 9.55% in 2021.

- China accounted for 35% of Australia's total export trade in 2018, with an annual transaction value of US$85 billion.

- Due to the limitations of the Australian market and the greater competitive pressure in foreign markets, Australia's manufacturing industry has not been able to develop well.

As mentioned earlier, Australia is very dependent on the import trade of machinery and transport equipment, and the annual import of machinery and transport equipment accounts for about 40% of all imports. In the long run, it is still indispensable for the development of Australian industrial manufacturing, especially for the automobile

manufacturing industry, the government should also give greater support and policies to enable the effective development of Australia's local automobile manufacturing industry.

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