35_Chile

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1 How have trademark applications by residents evolved relative to those by nonresidents in Chile between 2007 and 2021?

1.1 Abstract

Using World Bank World Development Indicators (WDI), this study examines the evolution of trademark applications in Chile between 2007 and 2021, focusing on the relationship between resident and nonresident filings. The analysis compares two key indicators: trademark applications, resident (by count) and trademark applications, nonresident (by count). Over this fifteen-year period, both indicators followed a similar cyclical pattern — marked by sharp increases between 2008 and 2010, followed by an equally sharp decline to near-2007 levels by 2012. After several years of relative stability, applications surged again toward the end of the period, with residents peaking in 2019 and nonresidents following in 2020. Interestingly, both peaks reached levels comparable to the earlier 2010 highs, suggesting a recurring pattern of expansion and consolidation in Chile's trademark activity. These dynamics reflect shifts in domestic entrepreneurial behavior, international engagement, and broader global economic cycles that influenced innovation and business formation in Chile.

1.2 1. Question

How have trademark applications by residents evolved relative to those by nonresidents in Chile between 2007 and 2021?

- **Resident proxy**: Trademark applications, resident (by count)
- **Nonresident proxy**: Trademark applications, nonresident (by count)

1.3 2. Data

- **Source**: World Bank World Development Indicators (WDI)
- **Indicators**:
  - Trademark applications, resident (by count)
  - Trademark applications, nonresident (by count)
- **Coverage**: Chile, 2007–2021
- **Notes**: National-level data only

1.4 3. Method

1. Filtered dataset for Chile and the relevant trademark indicators.
2. **Selected relevant columns**: Year, Indicator Name, and Value.

3. Pivoted resident and nonresident trademark data into separate series, ordered chronologically from 2007 to 2021.
4. Produced a dual-line graph comparing application trends to visualize relative movements and cyclical patterns over time.

(Analysis is descriptive; no causal inference applied.)

1.5 4. Results

- **Trademark applications (residents)**: Increased sharply between 2008 and 2010 before declining to roughly 2007 levels by 2012. From 2012 to 2018, application volumes remained relatively stable, followed by a strong rebound peaking in 2019.
- **Trademark applications (nonresidents)**: Followed a nearly identical trajectory, with a sharp rise to 2010, a return to baseline by 2012, and another significant increase culminating in a 2020 peak.
- **Comparison**: Both resident and nonresident filings displayed synchronized cycles of expansion and contraction, with the 2019–2020 peaks matching the intensity of the 2008–2010 surge. This pattern indicates a close linkage between domestic and international engagement with Chile's intellectual property system.

(Figure 1. Chile: Trademark Applications by Residents vs Nonresidents, 2007–2021)

(Table 1. Pivoted dataset summary)

1.6 5. Interpretation

- The twin surges in resident and nonresident filings suggest that both domestic and foreign actors respond similarly to shifts in Chile's economic and innovation climate.
- The 2008–2010 boom may correspond to pre- and post-financial-crisis adjustments, as firms sought brand protection during volatile global trade conditions.
- The mid-decade stability reflects a normalization phase, likely driven by steady growth and policy continuity in Chile's intellectual property framework.
- The renewed upswing from 2019 onward may signal revived entrepreneurial activity, greater integration into international markets, and rising confidence in Chile's innovation ecosystem.
- The synchronization of resident and nonresident trends highlights Chile's interconnectedness with global business cycles and its role as a stable, open economy for intellectual property investment.

1.7 6. Limitations

- National-level aggregates may obscure industry-specific or regional variations in trademark activity (e.g., manufacturing vs. services).
- WDI data do not capture trademark renewals, approvals, or enforcement intensity, which could provide a deeper picture of innovation outcomes.
- The descriptive approach does not isolate the drivers behind these fluctuations, such as policy reforms, macroeconomic cycles, or international agreements.

1.8 7. Next Steps / Extensions

- Compare Chile's trademark application trends with those of similar Latin American economies (e.g., Peru, Colombia, Argentina) to explore regional convergence in innovation and branding

activity.

- Investigate relationships between trademark filings and macroeconomic indicators like GDP growth, business creation rates, or foreign direct investment inflows.
- Examine how digital transformation, online commerce, and technology startups may have influenced the post-2018 resurgence in filings.
- Assess the role of trade agreements and IP law reforms in shaping foreign and domestic participation in Chile's trademark system.

[1]:
```
# How have trademark applications by residents evolved relative to those by␣
 ↪nonresidents in Chile between 2007 and 2021?

import pandas as pd
import matplotlib.pyplot as plt
import os

# Folders
data_raw_folder = "data_raw/"
data_clean_folder = "data_clean/"
figures_folder = "figures/"

# Load CSV
filename = "infrastructure_chl_filtered.csv"  # Filtered dataset with only␣
 ↪relevant rows
df = pd.read_csv(os.path.join(data_raw_folder, filename))

# Keep only needed columns
df = df[["Year", "Indicator Name", "Value"]]

# Convert Year and Value to numeric, drop invalid rows
df["Year"] = pd.to_numeric(df["Year"], errors="coerce")
df["Value"] = pd.to_numeric(df["Value"], errors="coerce")
df = df.dropna(subset=["Year", "Value"])

# Pivot indicators into separate columns
df_pivot = df.pivot(index="Year", columns="Indicator Name", values="Value").
 ↪reset_index()
df_pivot = df_pivot.sort_values("Year")

print("Pivoted Chile dataset:")
display(df_pivot)

# Interpolate missing values for smooth plotting (optional)
df_plot = df_pivot.interpolate(method='linear')

# Plot the two indicators
plt.figure(figsize=(10,6))
```

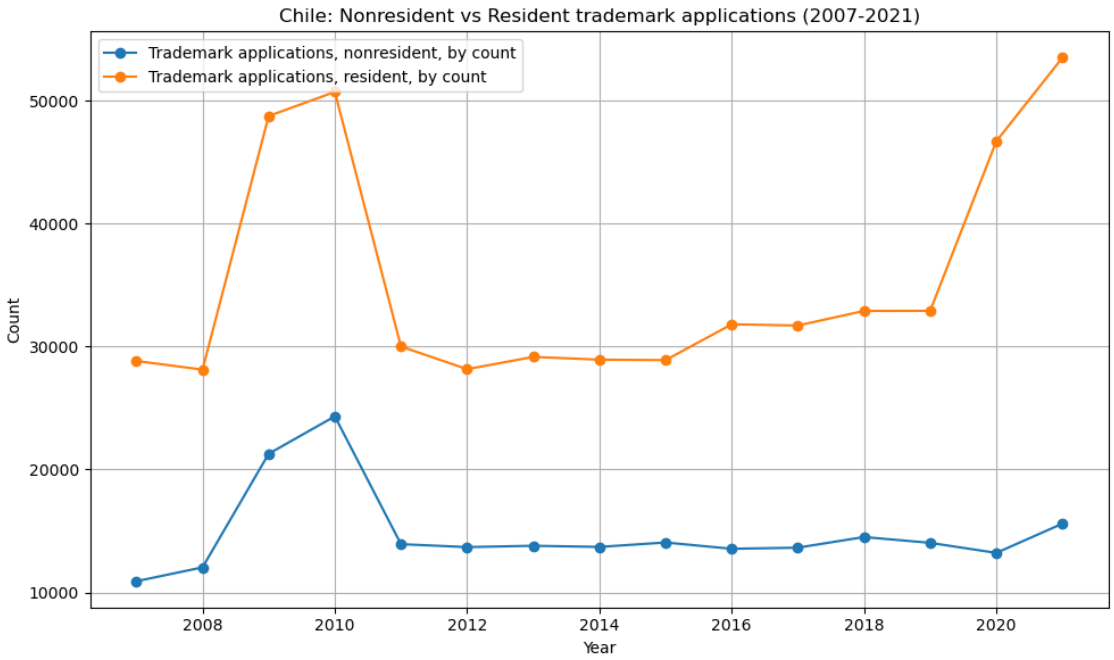
```
plt.plot(df_plot["Year"], df_plot["Trademark applications, nonresident, by␣
 ↪count"],
         marker='o', linestyle='-', label="Trademark applications, nonresident,␣
 ↪by count")
plt.plot(df_plot["Year"], df_plot["Trademark applications, resident, by count"],
         marker='o', linestyle='-', label="Trademark applications, resident, by␣
 ↪count")

plt.title("Chile: Nonresident vs Resident trademark applications (2007-2021)")
plt.xlabel("Year")
plt.ylabel("Count")
plt.legend()
plt.grid(True)
plt.tight_layout()
plt.savefig(os.path.join(figures_folder,␣
 ↪"chile_nonresident_vs_resident_trademark_applications.png"))
plt.show()

# Save cleaned CSV
df_pivot.to_csv(os.path.join(data_clean_folder,␣
 ↪"chile_nonresident_vs_resident_trademark_applications"), index=False)
```

Pivoted Chile dataset:

Indicator Name	Year	Trademark applications, nonresident, by count	\
0	2007	10908	
1	2008	12036	
2	2009	21281	
3	2010	24328	
4	2011	13925	
5	2012	13684	
6	2013	13794	
7	2014	13701	
8	2015	14061	
9	2016	13548	
10	2017	13640	
11	2018	14505	
12	2019	14032	
13	2020	13214	
14	2021	15595	

Indicator Name	Trademark applications, resident, by count
0	28833
1	28130
2	48771
3	50733
4	30011
5	28169

6	29167
7	28939
8	28903
9	31820
10	31720
11	32909
12	32915
13	46719
14	53520



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