Question 4: Billionaires

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1. Introduction

To tackle this problem, we investigate a few relationships found in the data. The first one we'd like to examine is the claim that the US has more new billionaires who came from entrepreneurial success vs in other developed and emerging economies where there tends to be more inherited wealth.

2. Entrepreneurial spirit in US vs Others

We start by examining the United States billionaire landscape on its own, checking to see how many of the billionaires came from entrepreneurship and how many came from inherited wealth.
First want to extract US billionaires only.

After that, want to compare their sources of wealth and how it changed over the 3 time periods. For each period, want to calculate the proportion of wealth that was inherited and that which was not inherited.

We use a simple pie chart to display the change in proportion of those who inherited wealth over the 3 time periods.

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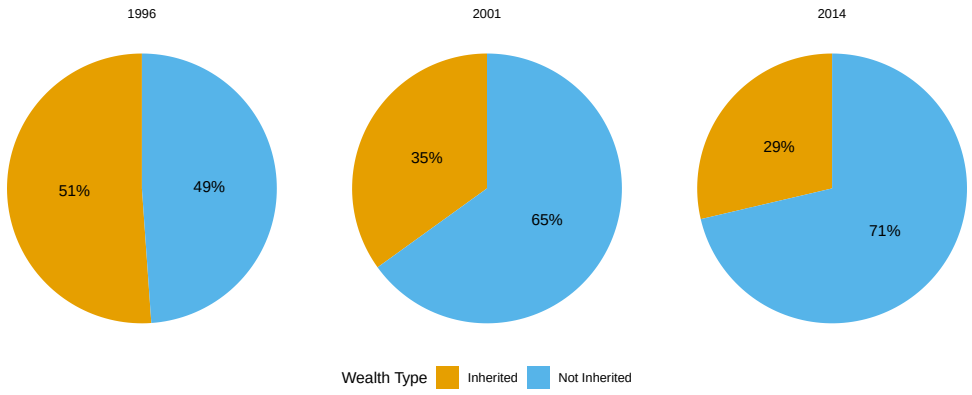

Figure 2.1: Pie chart showing proportions of US billionaires that had inherited vs those that did not inherit their wealth

The following table also shows how even though the proportion of inherited wealth has decreased relative to non-inherited sources, the number of billionaires who have inherited their wealth has increased.

Table 2.1: Table showing the US inheritance statistics

Year	No. of billionaires who inherited their wealth	No. of billionaires who have not inherited their wealth
1996	69	66
2001	94	175
2014	143	356

This leads us to investigate what entrepreneurial spirit and inherited wealth looks like in countries outside of the United States.
We begin again by extracting all the billionaires from outside of the US.

Then we obtain the proportion of this group that have inherited their wealth vs those that have not.

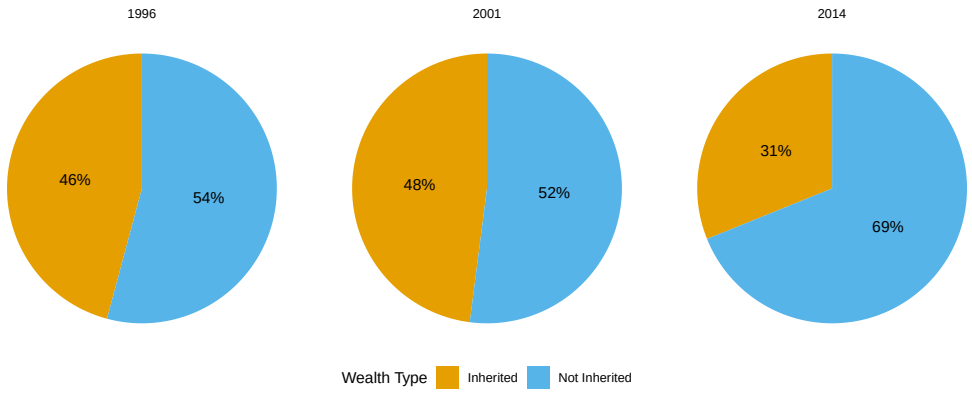

Figure 2.2: Pie chart showing proportions of those outside of the US billionaires that had inherited vs those that did not inherit their wealth

Table 2.2: Table showing Outside of the US inheritance statistics

Year	No. of billionaires who inherited their wealth	No. of billionaires who have not inherited their wealth
1996	132	156
2001	129	140
2014	359	795

Figure 2.2 shows us that while there was a decrease in the proportion of those who obtained their wealth from non-inheritance over 1996-2001, a large increase in this proportion occurred over 2001-2014. Note also how in each period the proportion of those who made their wealth from non-inheritance is greater than half of the population of billionaires outside of the US. This contradicts the statement saying that outside the US houses billionaires who've mostly sourced their wealth from inheritance.

Tables 2.1 and 2.2 show how even though the US has a slightly higher proportion over time of those billionaires who had not inherited their wealth which had increased over the time periods, those from outside of the US also experienced a decrease in proportion of the number of wealthy coming from inheritance.

A simple calculation shows that the growth rate for those who have inherited wealth in the US is 36.2% for 2001 and 52.1% over 2014, and 165.2% and 103.4% for those who have not inherited wealth. These same rates for those outside of the US are -2.3% for 2001 and 178.3%, and -10.3% and 467.9%.

What these figures show is that those from outside of the US have experienced the largest growth rate in the number of new billionaires who have not come from inherited wealth. This contradicts the first statement, showing that there may be a stronger entrepreneurial spirit displayed by those from outside of the US in more recent years, seen with the higher growth rate when compared to that of the US over 2001-2014.

3. Sector analysis

This section lays out the analysis of the second statement that most new-made millionaires are in software, compared to consumer services type industries of the 90s.

Here I created a plot showcasing the top 10 billionaire sectors while using number of billionaires in software as a measuring device.

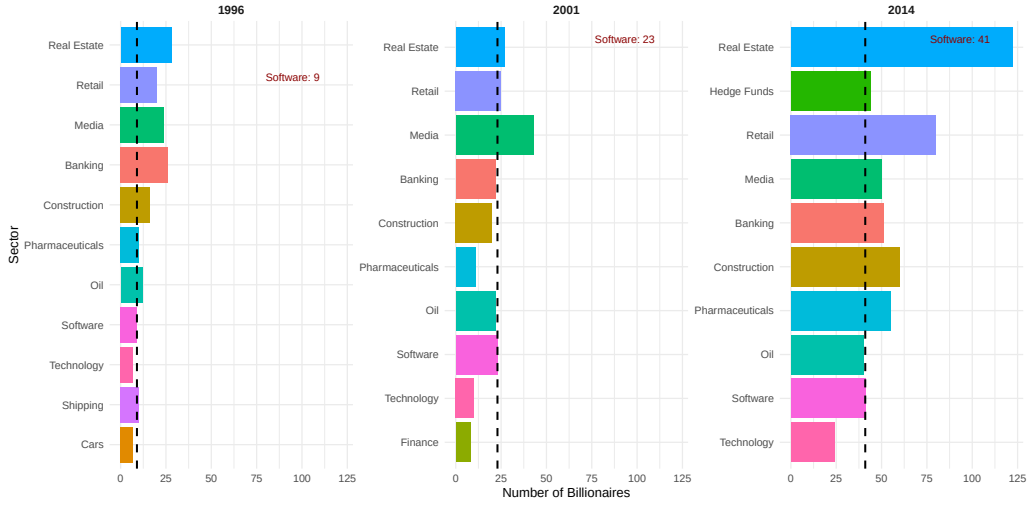

Figure 3.1: Column plots showing the top 10 billionaire sectors over the 3 periods, using the number of software billionaires as a benchmark in each

Figure 3.1 shows that the second statement is also not valid. Clearly, the number of billonaires in the software sector are lagging behind many sectors such as real estate, retail, construction, media, banking, pharmaceuticals and hedge funds.
To evaluate the second part of this statement we include GDP per country in the analysis. This entails using a simple linear regression to model if coming from a richer country increases or decreases the probability of the billionaire being part of the software sector.

Table 3.1: Table showing results of regression of log of GDP on the probability of being in the software sector

Variable	Coefficient	Std. Error	Statistic	p-value
(Intercept)	-7.223	4.763	-1.516	0.130
ln_gdp	0.006	0.003	1.909	0.057
year	0.004	0.002	1.481	0.139

Table 3.1 shows also contradicts the statement made. It shows that there is a very small and positive insignificant linear relationship between GDP and the probability of a billionaire being in the software sector, after including for time controls.

Fama & French (1997)

References

Fama, E.F. & French, K.R. 1997. Industry costs of equity. *Journal of financial economics*. 43(2):153–193.

Appendix

Appendix A

Some appendix information here

Appendix B