

Wealth of Nations Latent Dirichlet Allocation

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1 Introduction

Adam Smith's *Wealth of Nations*, published in 1776, spans over five hundred pages of old-style English, making it ideal for analysis with Latent Dirichlet Allocation (LDA), a machine learning algorithm that identifies hidden topics in text. LDA scans the text to detect patterns of words that frequently appear together, grouping them into themes for further analysis. This mathematical approach offers new insights into large texts. Applying LDA to the introduction and Book I of *Wealth of Nations* revealed three distinct topics: inputs/outputs, currency, and society.

2 Topic One

The first topic's words revolve around inputs and the needs of a workforce, including labor, time, rent, wages, corn, land, and improvement. Smith discusses how all these elements are necessary for a functioning society and how they are innately interconnected. Smith states, "improvements in the productive powers of labor, which tend directly to reduce the rent price of manufactures, tend indirectly to raise the real rent of land." This demonstrates how the costs of manufacturing can fluctuate and are all linked. In the book, there seems to be a greater emphasis on the intangible aspects of manufacturing, which can be seen in Topic 1 of the LDA. During the discussion of manufacturing and agriculture, there is little mention of equipment or raw materials, but rather a focus on labor, rent, and time.

3 Topic Two

The second topic centers on currency and trade value, which is logical since Smith devotes several chapters to discussing how monetary systems naturally arise. The main topic words include time, stock, rise, profit, price, proportion, gold, and shilling. Smith explains how currencies evolve from the inefficiencies of bartering once a society becomes advanced enough, with individuals taking on specialized jobs or participating in manufacturing processes where they handle just one specific task. Sentences in this topic mention natural prices and the rise of expenses, but interestingly, corn is not a keyword in this topic. The machine learning algorithm grouped currency-related terms with a strong focus on "hard" currencies such as shillings and gold.

4 Topic Three

The final topic focuses on society, with keywords including country, society, people, money, market, quantity, and employed. Throughout the book, Smith does not only discuss city-based manufacturing as a path to prosperity but also emphasizes the importance of importing and exporting resources and goods to other countries. Expanding the range and access to resources can lead to changes in the real value of a nation's currency: "when, after the discovery of the abundant mines of America, corn rose to three and four times its former money price, this change was universally ascribed, not to any rise in the real value of corn, but to a fall in the real value of silver." During Smith's time, there were large fluctuations due to the ease of water transportation to other countries and the influx of raw resources from colonies. A country needed a strong economic base, particularly in the industrial sector, but also had to leverage outside advantages through trade and external power.

5 Conclusion

Using LDA to analyze Smith's *Wealth of Nations* has allowed us to see how distinct topics emerge, leading to a deeper understanding of the book. Through this analysis, three major groups formed, which highlight important themes and takeaways from his work.