## **Resource 1: US Industrialization Process in the Late 19th Century**

Adapted from: Acuña-Alfaro, Jairo. US Industrialization Process in the Late XIX Century. The Natural Resource Endowment.

"At the beginning the combination of the land, a great natural resource to be exploited, together with a rapidly growing, able population, gave Americans a history of unprecedented overall economic growth".

--- Hughes, Jonathan & Cain, Louis P. (1998). American Economic History. Fifth Edition. Addison-Wesley. United States. *p.602.* 

## INTRODUCTION

In what ways did the available natural resource base influence American economic growth in the nineteenth century? . . . .

## AMERICAN ECONOMIC GROWTH IN THE 19th CENTURY

The exceptional rate of growth of the United States in the XIX century, which leads it to catch-up with the Europeans leaders, especially the United Kingdom, and subsequently, to position as a world leader, may be related with the rapid assimilation of modern machines and tools of production. American economic growth was first devoted to the so-called 'light industry', as textiles, leather and foodstuff-producing. Later on, with the advancement of transportation and communication, came the development of 'heavy industry', with the construction of railroads, steam-boats, and the parallel coal, iron and steel-making industries. The distribution and commercialization of goods soon followed.

The direction of change in American manufacture is demonstrated by statistics. By 1913 the United States made 31.9 million metric tons of crude steel, compared with 35.5 for all Western Europe. The US also mined 517 million metric tons of coal, compared with Europe's 493 million. And, by the 1880s businessmen and politicians in Britain were already acutely aware that the economic prosperity and political status the first industrial nation had enjoyed for almost a century was being challenged with steadily increasing effect.

In this case the United States was catching-up and forging ahead in the industrial lead, turning economic and political activities towards the new huge economy that emerged from the other side of the Atlantic. For example, Edison's invention of the lamp was accompanied by the development and promotion of an entire system of generating, distributing, consuming and measuring electric power. In that sense, Edison "directed a team effort that produced a working lamp in one year and an entire commercial electric system in four". It is an example of complete innovative process of research, development, manufacturing, finance, promotion, publicity and politics, to lay conduits in the first generating station in New York in 1882. Edison's innovation was vital in the American and world-wide industrialization process. It provided a source of lighting and power that "altered urban living and transportation; changed the ways of the workplace; and gave rise to new industrial methods such as electrolytic processes for producing copper and other materials."

## INFLUENCE OF ABUNDANT NATURAL RESOURCES ON US GROWTH

There is no doubt the American economy had a privileged endowment of natural resources. If we compare the size of the country, it becomes clear. While the US territory covers 9,629,091 square kilometers, together, the UK, France, Sweden and Germany hold just 1,594,808 square kilometers. In addition, in comparing the US with other countries, relative to population, the US had a usually rich resource base. Indeed, it was short on labor and long on raw material. In that sense, the US industrialization process, especially, in the late 19<sup>th</sup> century, was confined mainly to its large access to natural resources and to the world's largest domestic market.

Another fact that explains the growth of the US in late nineteenth century is what has been called 'the logic of managerial enterprise'. The technologically advanced and capital-intensive American industries were characterized by a dual economic principle. They operated as economies of scale and economies of scope. Economies of scales refer to the economics principle that large plants can produce at a lower cost than smaller competitors, because the cost per unit falls as the volume of outputs rises. Meanwhile, economies of scope, refers when large plants can use many of the same raw and semi-finished materials and intermediate production processes to make a variety of different products.

The abundant natural resources of the country and the development of communication means, such as railroads, the telegraph and steamboats "made possible to speed goods and messages through an entire economy for the first time". Furthermore, once precious metals were found they tended to dominate mineral extraction at the expense of everything else.

Finally, when thinking about American natural resource endowment, it is important to consider the ability of its citizens to innovate. Besides the large resources at their disposal, they chose industrial processes of scope, adding more value to the resources they inherited. For example, to make a technology like steel production work, Americans got useful insights into seeing exactly how Europeans did it, but successful steel production required that European methods be altered to fit local American conditions (e.g. the precise chemical composition of local ores and coal, etc.).

Early in the nineteenth century, Europeans knew what worked for their particular local resources, but did not know why. In contrast, by the end of the 19th century, the chemistry of steel making had been largely worked out and tacit knowledge of local conditions became less important. Thus Americans could know why things worked and could therefore tell what they could expect from any given inputs of coal and ore and how they could change production methods to suit what they had on hand. In addition, it is important to note that in the case of wood (particularly abundant compared with other materials, for example) it was widely used for houses, tools, furniture and transport equipment. As a matter of fact, "in 1860 American per capita wood consumption was five times that of England and Wales". In 1860, the lumber industry was second only to cotton textiles in creation of value added and market value, as figure below shows.



