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Financing Universities and a Plea for Privatization

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3.1 Three generations of universities

An investigation into ways by which universities can escape the financial predicament in which many find themselves should start with an analysis of the current situation and the forces that created it. In earlier work three generations of universities were defined (Wissema, 2009). The Medieval, or First Generation, University was involved in education based on the achievements of antiquity. Universities of this type did not engage in research as we now know it. They rather passed on existing knowledge and discussed interpretations of the classical texts, the infamous scholastic exchanges. Teaching was in Latin, which allowed for considerable mobility of masters and students. The modern scientific method, based on the objective observation of nature, evolved outside universities. Leonardo da Vinci, Galileo Galilei and so many others who made groundbreaking discoveries all worked outside universities. After the Renaissance, some of the groundbreaking scientists did work at universities. Isaac Newton, for instance, was a professor at the University of Cambridge; Herman Boerhaave, who did fundamental research in medicine and botany, worked at Leiden University where he became rector in 1714.

3.1.1 The Second Generation University

It was only in the post-Napoleonic period that the first Second Generation University (2GU) was created. This was the University of Berlin, later named Humboldt University after its founder. This
example was rapidly followed by many others although, at the end of the nineteenth century, there were still quite a few universities that retained the old model. The primary focus of the 2GU was research according to the modern scientific method. Education followed in the slipstream, employing a master-fellow-apprentice system. 2GUs taught in their national languages. Mobility suffered and universities would recruit most students from the area around them. The *raison d’être* of the 2GUs was scientific development: they were not interested in bringing their results to the market. They left that to private inventors who sometimes collaborated with universities but were not part of it: James Watt, Benjamin Franklin, Samuel Morse, Thomas Edison, Alexander Bell and so many others. Agricultural universities, established for the first time in the United States in 1864 in Iowa thanks to the land-grant bill, were closer to practice.

At the end of the nineteenth century, companies started creating their own research laboratories, first at what is now BASF where the Haber-Bosch process for producing ammonia and hence fertilizers was invented. Industrial research labs were heavily involved in fundamental research, competing and collaborating with universities. Fritz Haber, the inventor and one of the BASF’s directors, received the Nobel Prize in Chemistry in 1918. Hendrik Casimir, the director of the Philips Electronics’ Physics Laboratory, discovered the Casimir effect and was nominated for the Nobel Prize in Physics.

Following the crash of 1929, many countries established government-sponsored institutes for applied research with the aim of helping small- and medium-sized companies that could not afford research activities of their own. The applied research in agriculture also resulted in significant production increases. The knowledge development system of the nineteenth and early twentieth centuries was neatly specialized according to the principles of the industrial revolution: universities did fundamental research, applied research was the domain of special public laboratories and companies did the development. Only some large enterprises did all three, but they had a different department for each task.

### 3.1.2 Trends leading to a paradigm shift

In the 1960s, European universities were confronted with a tsunami of new students. In the United States, this influx had started earlier when, as a result of the GI Bill, demobilized soldiers from World War