

# What is an ECOSYSTEM?

*Knowledge is probably the only antifragile<sup>1</sup> asset in the world. Knowledge-based businesses and economies have three unique characteristics, especially when compared to industrial economies and asset-heavy businesses<sup>2</sup>.*

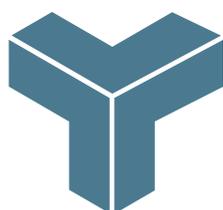
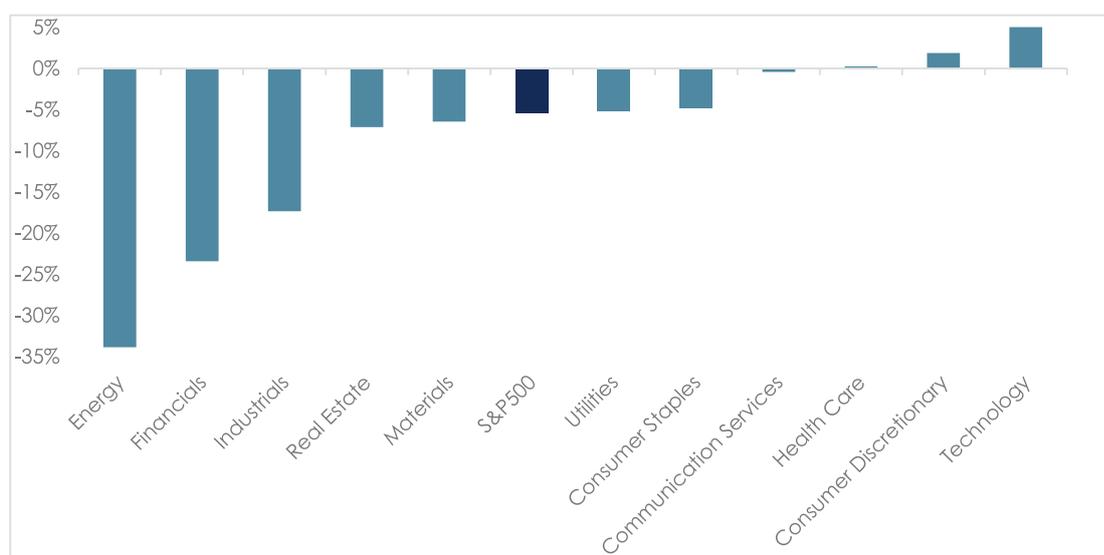
*First, the more we know, the more we can learn, like an inverted pyramid structure. In industrial economies and asset-heavy businesses it is the opposite<sup>3</sup>.*

*Second, the more we know, the faster we can learn, like a snowball rolling down a snow-covered hillside. In industrial economies and asset-heavy businesses it is the opposite, because owning lots of industrial assets doesn't mean we can acquire even more assets at a higher speed.*

*Third, the more we use and tear apart our knowledge, the stronger and fresher it becomes. In industrial economies and asset-heavy businesses it is the opposite, as more usage leads to faster amortization and asset deterioration.*

COVID-19 has divided most economies into two parts – necessities (let's call it N) and optionals (let's call it O). The N sector of most economies – healthcare, agriculture, IT, food retail, logistics, government services – is operating at almost full capacity. The O sector – tourism, airlines, entertainment, restaurants, theatres – has essentially collapsed. Chart of the Week indicates the performance of various sectors of the S&P 500 stock index. The problem is that it is very hard to divide companies such as Amazon or Apple into specific sectors. For example, is Apple a utility or an IT company, or both?

Chart of the Week: The S&P 500 Stock Index Sectors (Price change since January 2, 2020)



FUTURES STUDIO

Think to connect!

<sup>1</sup> "Some things benefit from shocks; they thrive and grow when exposed to volatility, randomness, disorder, ... and love adventure, risk and uncertainty. Yet, ... there is no word for the exact opposite of fragile. Let us call it anti-fragile. Anti-fragility is beyond resilience or robustness. The resilient resists shocks and stays the same; the anti-fragile gets better." – Nassim N. Taleb, [Antifragile: Things That Gain from Disorder](#), 2014

<sup>2</sup> Businesses which own lots of physical assets, such as plants and heavy equipment, are considered Asset-Heavy.

<sup>3</sup> For more on this, see the [Law of Diminishing Marginal Returns](#).

The Merriam Webster dictionary<sup>4</sup> defines ecosystem as **(1)** a complex community of organisms and its environment functioning as an ecological unit; **(2)** a network of businesses that resembles an ecological ecosystem because of its complex interdependent parts.

Ecosystems can be physical or virtual. The most obvious example of an extremely complex ecosystem is the human body, with thousands of interdependent parts and senses. Just like humans, businesses have interdependent parts, life-expectancy and mortality rates. On average, the typical company lasts about ten years before it gets bought by another company, merges, or is simply liquidated<sup>5</sup>.

Business ecosystems have similar attributes. Some ecosystems adapt and survive, others disappear or get taken over by competing ecosystems: *“our research shows how ecosystems rise and fall. According to the findings, even successful ecosystems often do not last, given their highly dynamic nature”*<sup>6</sup>. Designing ecosystems has become an essential part of the business model design.

## 1.0 Ecosystems of Individual Companies

Ecosystems of individual organisations can be physical/tangible or nonphysical/nontangible (also known as virtual) or a combination of both. The combined model is, in our opinion, the most powerful. Let us think of a few existing and successful examples.

For many people visiting and/or living in Dubai, *The DubaiMall* – with a total area<sup>7</sup> exceeding one million square meters – has become a true ecosystem. Residential apartments, hotel rooms, sports activities such as an Olympic-sized skating rink, a large medical clinic and all sorts of entertainment allow people to spend weeks in one location. The Dubai Mall is an example of a unique and a very successful physical ecosystem, which could be replicated in many cities around the world.

*Walmart Inc.* and *Costco Wholesale Corp.* are the two largest retail store corporations in the world<sup>8</sup>. Walmart employs more than 2,0 million people, operates 11,500 stores in more than 25 countries, generates annual revenues exceeding US\$ 500 bn and has a market capitalization of around \$350 bn<sup>9</sup>. Walmart is trying to build an ecosystem for its customers by offering a range of products and services, from financial to medical. Many Walmart customers are ignored by financial institutions because they earn low incomes. Walmart has filled this gap, by offering financial services tailored to its customers.

**Chart 1.0: Daily Stock Prices (rebased to January 2020 = 100)**



<sup>4</sup> [www.merriam-webster.com](http://www.merriam-webster.com)

<sup>5</sup> Madeleine I. G. Daepf, et al. *The mortality of companies*. *Royal Society Interface*, 2015

<sup>6</sup> M. Reeves et al., *How Business Ecosystems Rise (and Often Fall)*. MIT Sloan Management Review, 2019

<sup>7</sup> [www.thedubaimall.com](http://www.thedubaimall.com)

<sup>8</sup> Forbes, **Who Are the 10 Biggest Retailers in the World**, June 2020 (for charts see Appendix 1)

<sup>9</sup> As of June 2020, Walmart had a total of 2.83B shares trading at \$123.94, hence the market cap of \$351.27B.

Sberbank is Russia's largest bank, with nearly 100 million active retail clients throughout Russia<sup>10</sup>. It employs 280,000 people and consistently generates more than \$10,0 bn of net profits every year. Under the leadership of its innovative CEO, it has started to build its own ecosystem, from insurance, healthcare and logistics to online shopping, to lure its customers to do as much via Sberbank platforms as possible. Although Sberbank seems to be heading towards a virtual ecosystem, it could add several physical structures, to become an all-encompassing ecosystem, virtual as well as physical.

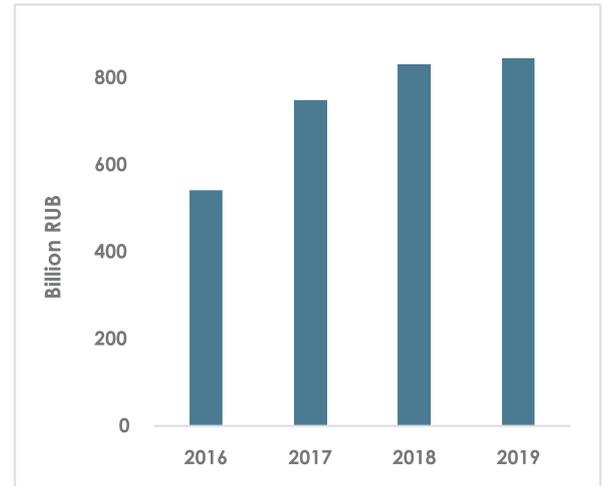
Sberbank's logic is simple – if we don't offer goods and services of other industries, other industries will offer banking services. In the IT sector, various giants such as Microsoft, Apple, Google, Amazon, Facebook are building ecosystems, which cut across several industries. Over the coming ten years, these IT companies will pose a much bigger threat to Sberbank, than any major western bank. If Apple Corporation, for example, applied for a full-scale banking license, it could quickly become the biggest bank in the world, with the largest number of customers and the highest credit rating<sup>11</sup>.

China's *Alibaba* has a financial arm called *Ant Financial*, which offers a lot of what many Chinese banks offer – global payment services, credit cards, investment management services – to more than 500 million customers. *Ant Financial* also analyses and tries to model Alibaba's existing userbase to better understand what future financial services customers may need. Many conventional banks don't have access to this information. Within the next decade, a significant part of China's financial services could revolve around *Ant Financial's* ecosystem and many Chinese banks could simply become users rather than coordinators of this financial ecosystem.

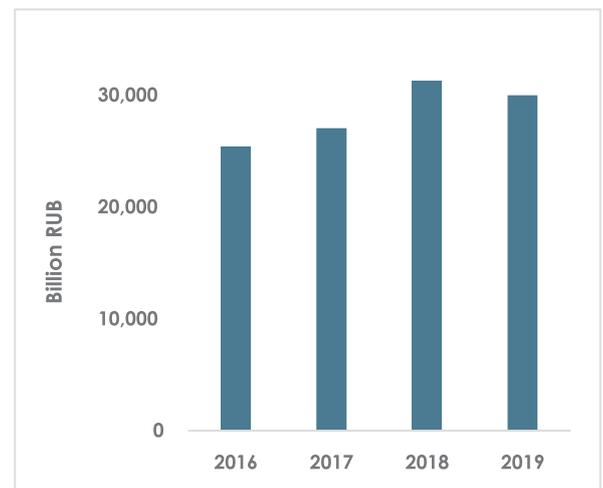
<sup>10</sup> <https://www.sberbank.com/investor-relations/financial-results-and-presentations>

<sup>11</sup> Apple Corporation currently has a AA+ credit rating, which is, for example, higher than JP Morgan Chase & Co's A+ credit rating, Deutsche Bank's A—rating or BNP Paribas' A+ rating or Sberbank's BBB rating.

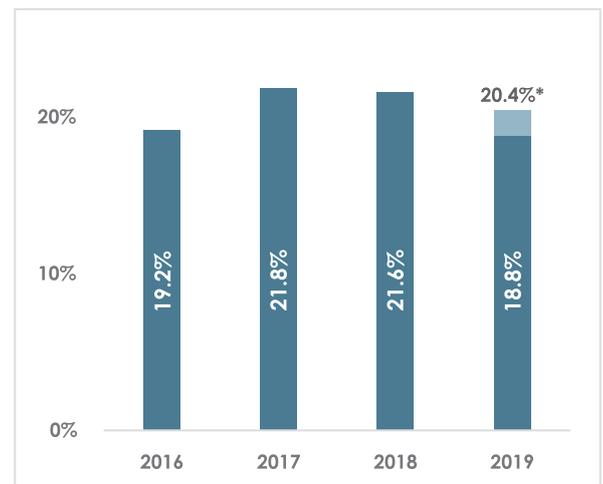
Chart 1.1: Sberbank's Net Profit



Sberbank's Total Assets



Sberbank's Return on Equity



\* ROE based on profit from continuing operations

## 2.0 Ecosystems of Various Industries

Just like with individual businesses, ecosystems of entire industries could be physical, virtual or a combination of both. Understanding ecosystems has become as important as designing business models. Over the next ten years, the word ecosystem could fully replace the word industry, as borderlines between industries are blurring. Let us think of two examples.

**Healthcare Industry:** A modern healthcare ecosystem, for example, has a minimal set of requirements to be fully functional and capable of progress.

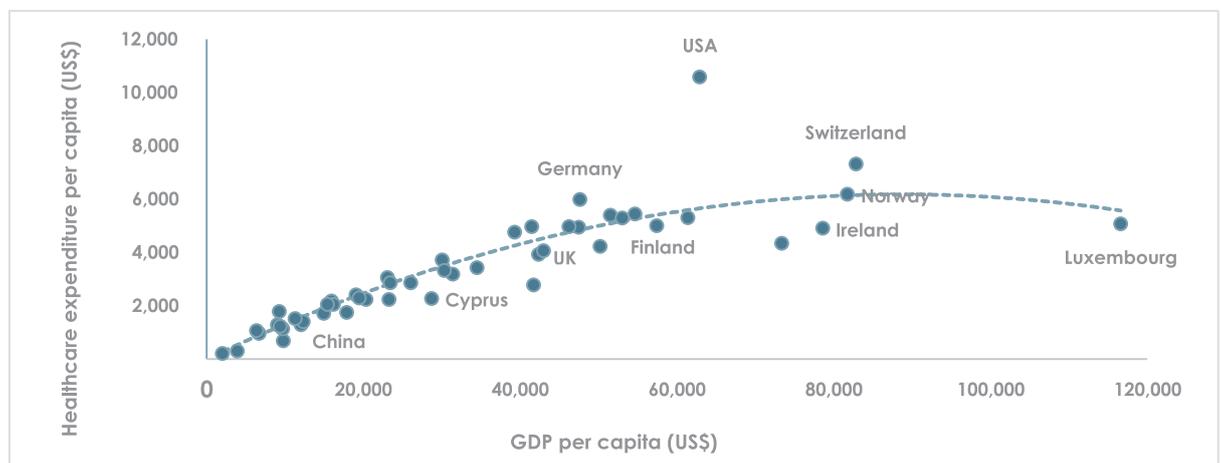
First, good quality education in areas such as medicine, biology and chemistry. Second, modern hospitals and clinics equipped with laboratories and analytical IT systems. Third, a medical culture that encourages practicing doctors to also teach, conduct research and keep learning rather than spend their time buying medical equipment. Fourth, an insurance system – public or private – that allows to share the costs of healthcare and thereby encourages people to undergo timely checkups. Fifth, an active government-led information campaign that informs people on healthy lifestyle choices.

If a country doesn't have a functional healthcare ecosystem, with all of its required components, then an individual hospital could create its own healthcare ecosystem, by building a modern university clinic. This ecosystem could then be connected to a global healthcare ecosystem. This solution would be especially relevant for emerging economies with dysfunctional healthcare ecosystems.

Even the most advanced healthcare ecosystems, however, need to constantly improve. As argued in a recent article<sup>12</sup> *"no health system, however sophisticated, can ever be fully prepared to cope with a pandemic of this nature and on this scale. We urgently need to build a global pathogen shield: a rapid response capability primed to develop new treatments and vaccines against novel diseases such as Covid-19 and deploy them at scale."*

As shown in Charts 2.0 and 2.1 there is a considerable correlation/relationship between expenditures on healthcare, GDP per capita and life expectancy. We must be careful, however, not to confuse a correlation with a causality/causation. For example, it could be that higher expenditure on healthcare leads to longer life expectancy. But it could also be that as people in wealthier societies live longer, they require higher healthcare expenses. Similarly, it could be that higher GDP per capita allows for higher health care expenditure, or, that higher healthcare expenditure improves life quality and leads to higher GDP per capita. In functional ecosystems, this causation becomes almost impossible to establish. We can also observe from Chart 2.2 that it doesn't make any difference whether the healthcare system is public or private.

Chart 2.0: Healthcare Expenditure per Capita vs. GDP per Capita, 2018



<sup>12</sup> [A global pathogen shield: the health security step to never again](#), by Noubar Afeyan & Ara Darzi, May 11 2020

Chart 2.1: Healthcare Expenditure per Capita vs. Life Expectancy, 2018

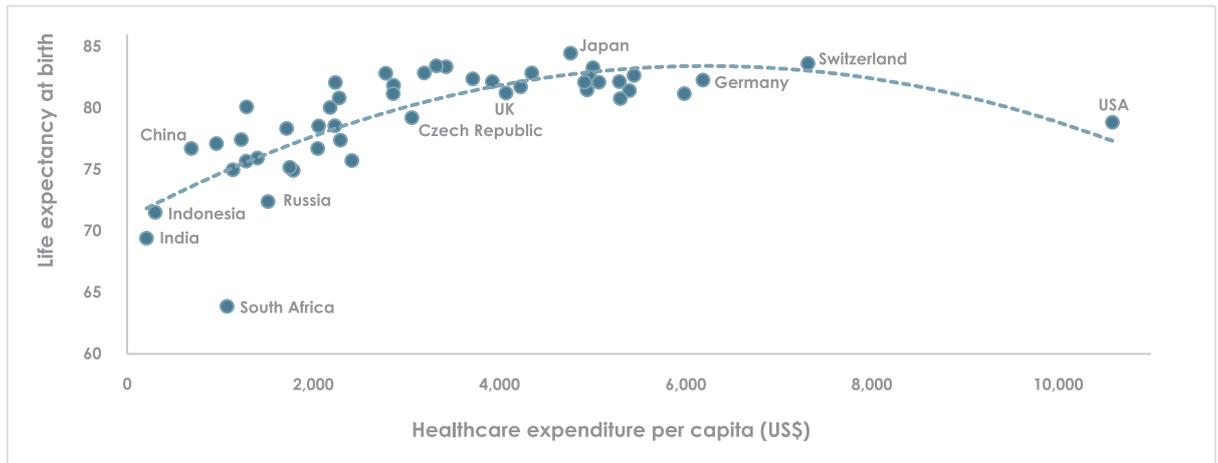
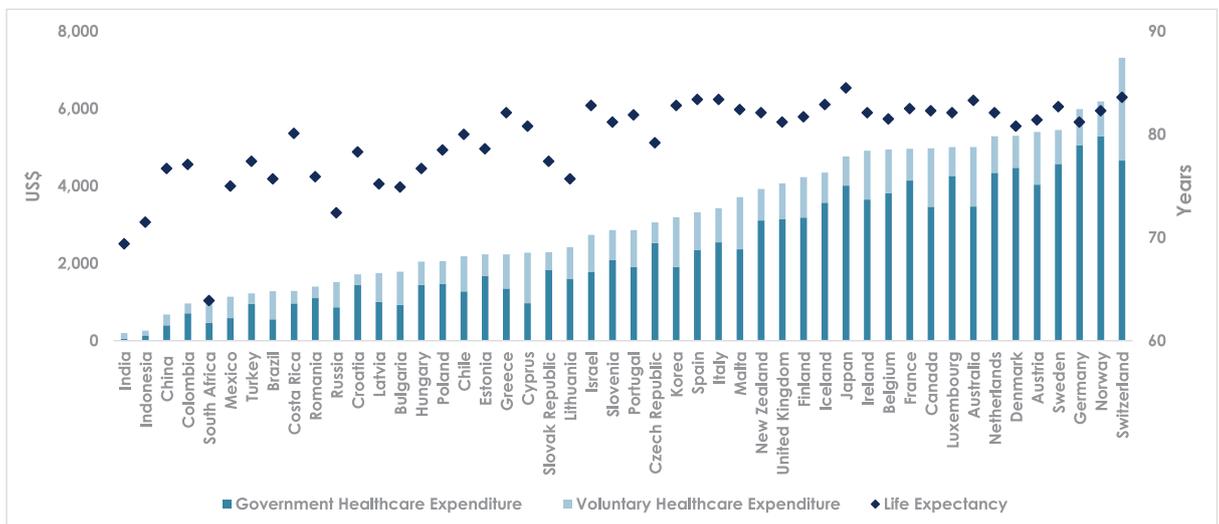


Chart 2.2: Healthcare Expenditure per Capita (Left Scale) vs. Life Expectancy (Right Scale), 2018



**Finance Industry:** A modern financial ecosystem requires three key components.

**First,** availability of savings in local currency. This, of course, will not be possible unless the central bank provides stable inflation expectations so that people save in their home currency, without worrying about eroding purchasing power<sup>13</sup>.

**Second,** these savings in local currency should be available in several forms – through banks, pension funds, insurance firms and other asset managers. Pension fund savings are long-term and could be invested in long-term projects. Without these long-term savings, countries can not launch long-term projects such as roads, bridges, railways.

**Third,** a modern legal framework which encourages long-term savings, investments and capital markets. This means constitutionally protected property rights, functional contract law and an independent judiciary.

If in healthcare one university-hospital could create its own ecosystem and plug it into the global healthcare ecosystem, in finance one financial institution can not create its own financial ecosystem, unless all three components mentioned above are functional. This is one of the main reasons institutions such as Sberbank are expanding into nonfinancial ecosystems.

<sup>13</sup> Unstable inflation expectations force people to save in US\$. This is one of the main reasons most emerging economies save in US\$. Those emerging economies which have succeeded in stabilising inflation expectations – Czech Republic, Poland, Peru, Chile, to name a few – have seen their local currency savings rise rapidly and are already capable of issuing 15-year or 20-year bonds in local currency.

### 3.0 Ecosystems of Countries

*"The people are free, and can be ruled only so far as they agree to obey. ... It is deplorable that history as it has been taught among us treats the great revolutions (French, Russian, etc.) only in terms of their ill effects and never acknowledges that it is possible to see them as struggles for liberty against injustice. As a result it has given our people a morality in which insubordination is synonymous with infamy, and authority with infallibility.*

*The great lesson to draw from revolutions is not that they devour humanity but rather that tyranny never fails to generate them.... Our study of politics leads us, then, to pose this problem: what regime, or what system, gives the maximum guarantee against oppression?"*

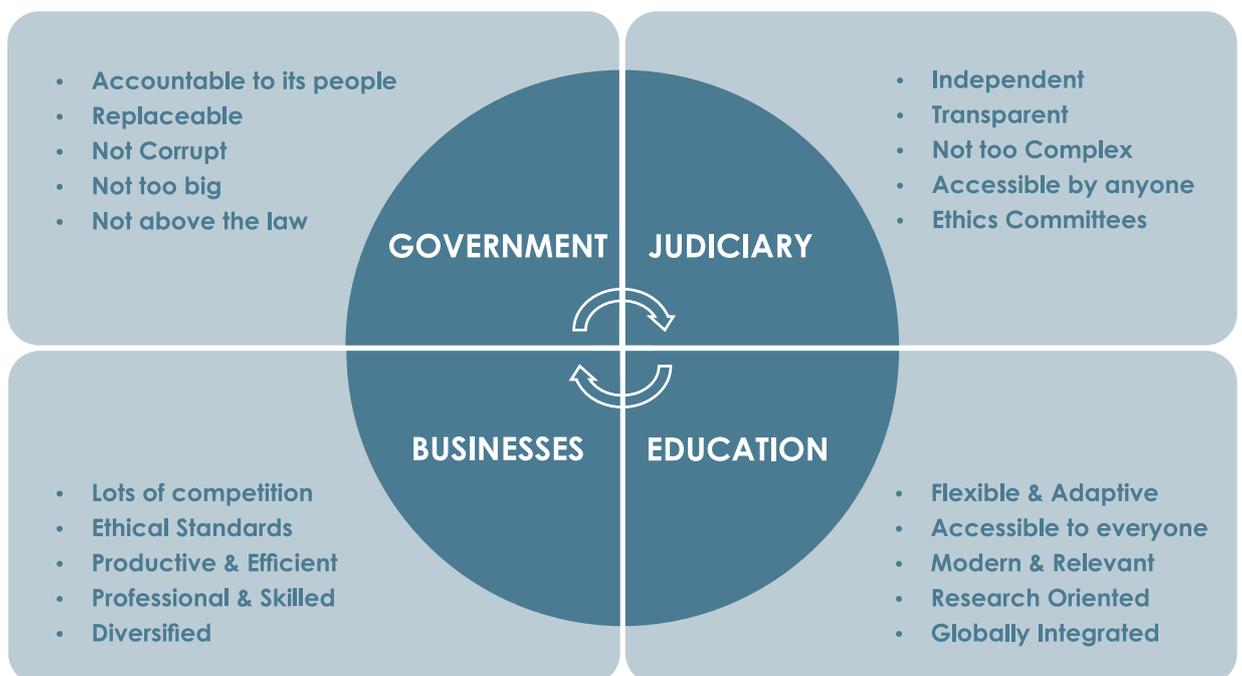
**Pierre E. Trudeau**<sup>14</sup>

Over the last thirty years many countries either disintegrated into smaller states or came very close to disintegrating. For example, the Soviet Union collapsed into 15 countries in 1991, Yugoslavia into six in 1992, Czechoslovakia into two in 1993 and so on. The province of Quebec almost separated from Canada in 1995 (and in 1982). The Scottish independence referendum of 2014 and Catalonia's of 2017. All of these indicate that countries, or economic blocks such as the EU, are also dynamic, living ecosystems, which could either die or survive.

The four most important components of any country's ecosystem are shown in Diagram 1.

Countries that don't have functional ecosystems, as indicated in Diagram 1, eventually disintegrate – like Yugoslavia or the Soviet Union – or experience major internal conflicts – Ukraine, Syria, Venezuela. The current COVID crisis has indicated that even developed countries such as the US have troubled ecosystems – the education is no longer as affordable<sup>15</sup>, the judiciary not as easily accessible, many businesses not as ethical and the government could simply be too big to manage.

**Diagram 1: The Four Pillars of the Ecosystem**



<sup>14</sup> *Approaches to Politics*, 1970, Pierre Elliott Trudeau, Prime Minister of Canada

<sup>15</sup> For more details about student flows see the charts in Appendix 1

## Conclusion

*“China’s post-Mao market transformation is one of the most dramatic events of our time. It has lifted hundreds of millions out of extreme poverty, freed one fifth of humanity from ideological radicalism, revived one of the oldest civilizations, and inspired all of us to explore the benevolence of the market. Yet capitalism as currently practiced in China suffers a severe failing: the lack of a marketplace for ideas.*

*...China needs to address its lack of a marketplace for ideas if it hopes to continue to prosper. An unrestricted flow of ideas is a precondition for the growth of knowledge, the most critical factor in any innovative and sustainable economy. The British Industrial Revolution two centuries ago introduced many new products and created new industries. China’s industrial revolution is far less innovative.*

*The active exchange of thoughts and information also offers an indispensable foundation for social harmony. It is not a panacea; nothing can free us once and for all from ignorance and falsehood. But the free flow of ideas engenders repeated criticism and continuous improvement. It also cultivates respect and tolerance, which are effective antidotes to the bigotry and false doctrines that can threaten the foundation of any society<sup>16</sup>.”*

**Ronald H. Coase**, 1991 Nobel Memorial Prize in Economic Sciences

Ronald Coase<sup>17</sup> was one of the most pragmatic economists of the 20th century. He believed in the Confucian tradition of seeking truth from facts and avoided ideological topics. Coase received the Nobel Prize for his work on what today is known as transaction costs.

Coase started his research journey from a simple question: why do people create companies instead of every person separately offering her product or service directly to the marketplace? The same question, by the way, is being asked today, with the advent of blockchain technologies. Coase quickly realised that market access is expensive and involves a lot of transaction costs (sometimes referred to as marketing costs). Here is how he explains it:

*“There are negotiations to be undertaken, contracts have to be drawn up, inspections have to be made, arrangements have to be made to settle disputes, and so on. These costs have come to be known as transaction costs. Their existence implies that methods of co-ordination alternative to the market, which are themselves costly and in various ways imperfect, may nonetheless be preferable to avoid the costs of carrying out transactions through the market<sup>18</sup>.”*

If access to markets were costless, argued Coase, there would be no point in forming companies. Instead, people would make arm’s-length transactions. But because markets are costly to use, the most efficient production process often takes place within a firm, and that is why people get together and create companies.

Coase made another brilliant observation, however. He argued that as companies get bigger, administration costs – sometimes called complexity costs – also rise. When administration costs start exceeding market access costs, companies stop growing and trade with other firms, in the marketplace. Here is how Ronald Coase explains it:

*“As more transactions are organized by an entrepreneur, the transactions would tend to be either different in kind or in different places. This is why efficiency will decrease as the firm gets larger. Inventions which bring factors of production nearer together, by lessening spatial distribution, tend to increase the size of the firm. Changes like the telephone and the telegraph which tend to reduce the cost of organizing spatially will tend to increase the size of the firm. All changes which improve managerial technique will tend to increase the size of the firm....*

<sup>16</sup> How China Made Its Great Leap Forward, by Ronald Coase & Ning Wang, Wall Street Journal, April 06, 2012

<sup>17</sup> [https://en.wikipedia.org/wiki/Ronald\\_Coase](https://en.wikipedia.org/wiki/Ronald_Coase)

<sup>18</sup> Nobel Lecture of 1991: The Institutional Structure of Production, by Ronald Coase

*Most resources in a modern economic system are employed within firms, with how these resources are used dependent on administrative decisions and not directly on the operation of a market. Consequently the efficiency of the economic system depends to a very considerable extent on how these organisations conduct their affairs, particularly, of course, the modern corporation<sup>19</sup>."*

For the purposes of our current report, the most important insight of Ronald Coase is that lower transaction costs allow for greater efficiency and prosperity. Bureaucratic hurdles and complexities erected by governments or legal systems increase transaction costs and destroy wealth. The best way for any government to increase prosperity is to reduce complexity and therefore transaction costs.

But as discussed throughout this paper, that is what functional ecosystems do – increase levels of trust and reduce complexities, to facilitate transactions between members. Many products become more valuable and trustworthy simply because they become part of an ecosystem. Lack of trust introduces a lot of complexity – legal, financial, logistical – which raises transaction costs and destroys profitability.

Given that ecosystems can reduce complexity and administration costs, ecosystems could become substantially bigger and even replace certain markets, especially in emerging economies which suffer from a lack of trust and immature market structures. Ecosystems could be the future market.

Ecosystems are also likely to replace industries and sectors, as borderlines between industries are blurring. Warren Buffett calls Apple a utility rather than an IT company. The logic is clear, Apple products have become indispensable to many consumers around the world. Therefore, it is no longer clear how to divide companies such as Amazon or Alibaba by industry. Within the next decade the word "ecosystem" will likely replace words such as "industry" or "sector".

This will, in turn, bring about major changes. For example, lots of money managers and pension funds invest based on industries or sectors. They will have to change their investment rules. Various bond and stock indices will have to restructure as well. Universities will need to change their education structures.

Most ecosystems tend to be knowledge oriented. Knowledge is a unique asset. Its characteristics – size, speed of growth and amortisation – differ radically from all other asset classes. Constant circulation of knowledge is the biggest secret to growing and refreshing all sorts of knowledge. Knowledge circulation should not be confused with information circulation. Knowledge sharing will most likely become the key ingredient of any functional ecosystem.

People with multitasking skills and diverse backgrounds are crucial for the survival and competitiveness of all ecosystems. Most antifragile ecosystems will consist of a combination of physical and virtual components. Ecosystems such as Dubai Mall will add virtual (or nontangible) components whereas ecosystems such as Sberbank should add physical components.

Countries with modern and functional ecosystems will continue to attract the best talent and the cheapest capital from around the world. Over the coming years, countries with dysfunctional ecosystems could disintegrate as their residents continue to emigrate to countries with more functional ecosystems.

And as argued by Ronald Coase *"an unrestricted flow of ideas is a precondition for the growth of knowledge, the most critical factor in any innovative and sustainable economy"*.

*David Tavadian, CFA*  
Founding Partner

### Grey Box: Characteristics of Ecosystems

After reading dozens of academic articles<sup>20</sup> on ecosystems, we have concluded that ecosystems have several unique characteristics:

- Ecosystems are usually coordinated by one hub, which sets most of the rules. All businesses, however, which connect to a given ecosystem, retain a significant degree of autonomy in pricing and design. This is different from quasi-captive systems such as Japanese Keiretsus or Korean Chaebols.
- In ecosystems, all members retain control over their assets and ownership.
- Ecosystems require a lot of coordination. If no coordination is required, then it is simply a market, not an ecosystem.
- In ecosystems final customers can assemble the product or the service in many different ways, by choosing different components, supplied by participants of the ecosystem.
- In ecosystems, the presence of one product or service raises the value of another product or service, and vice versa.
- Ecosystems can provide complete products and services without vertical integration or management structures – coordination without hierarchical governance.
- Ecosystems are usually the result of planned experimentations and design. Powerful firms, which plan to become ecosystem hubs, design rules or processes and make complementors abide to them.
- Ecosystems are not free. Connecting to an ecosystem involves some investment, which can not be reversed. This cost makes sure that businesses which join can not easily leave and join.

<sup>20</sup> Jacobides MG, Cennamo C, Gawer A. Towards a theory of ecosystems. *Strat Mgmt J.* 2018;39:2255–2276. <https://doi.org/10.1002/smj.2904>

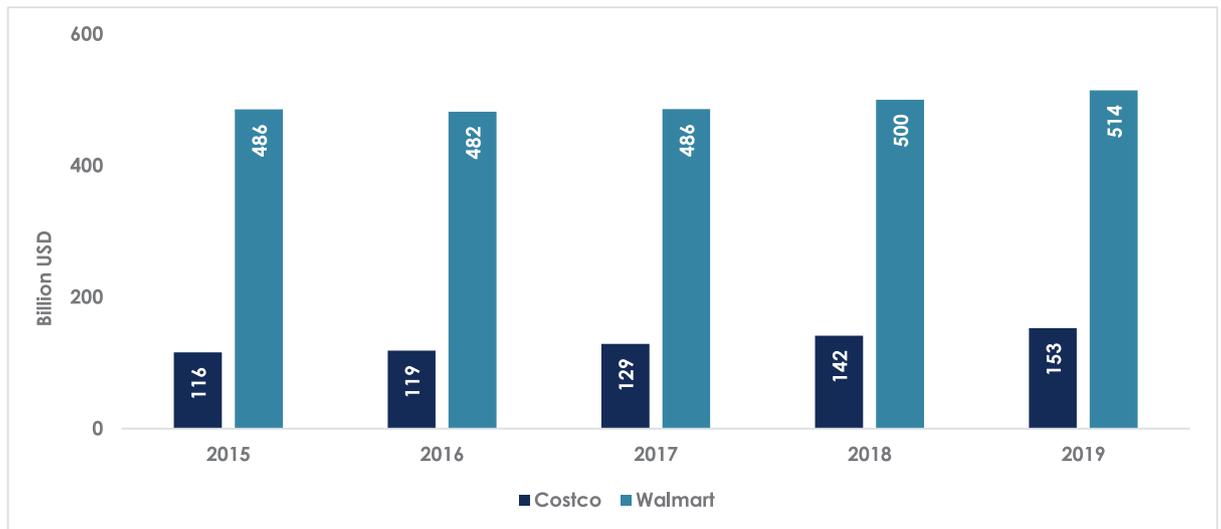
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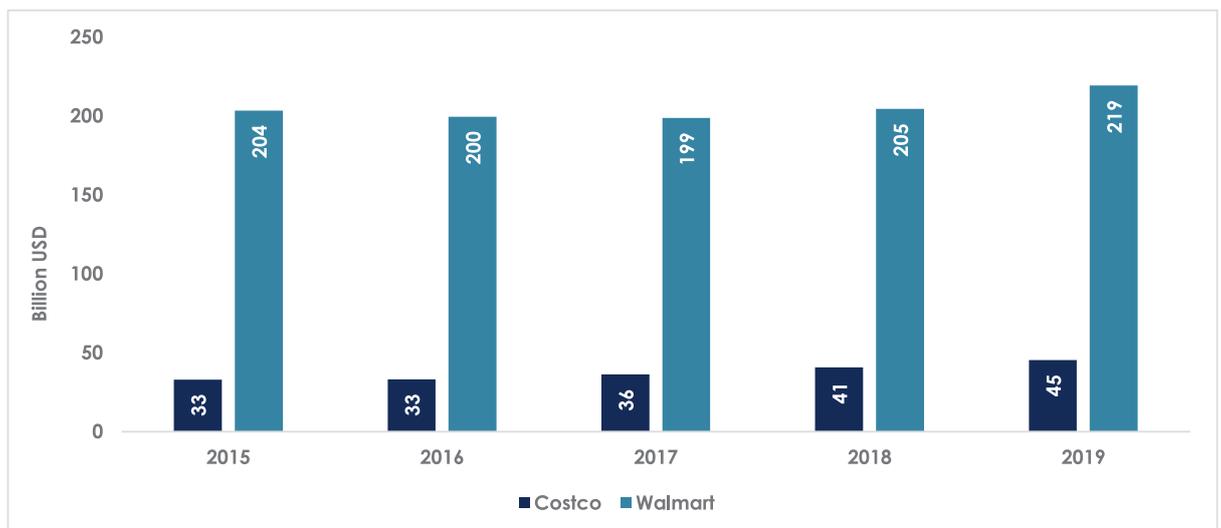
## Appendix 1

### Charts for Section 1

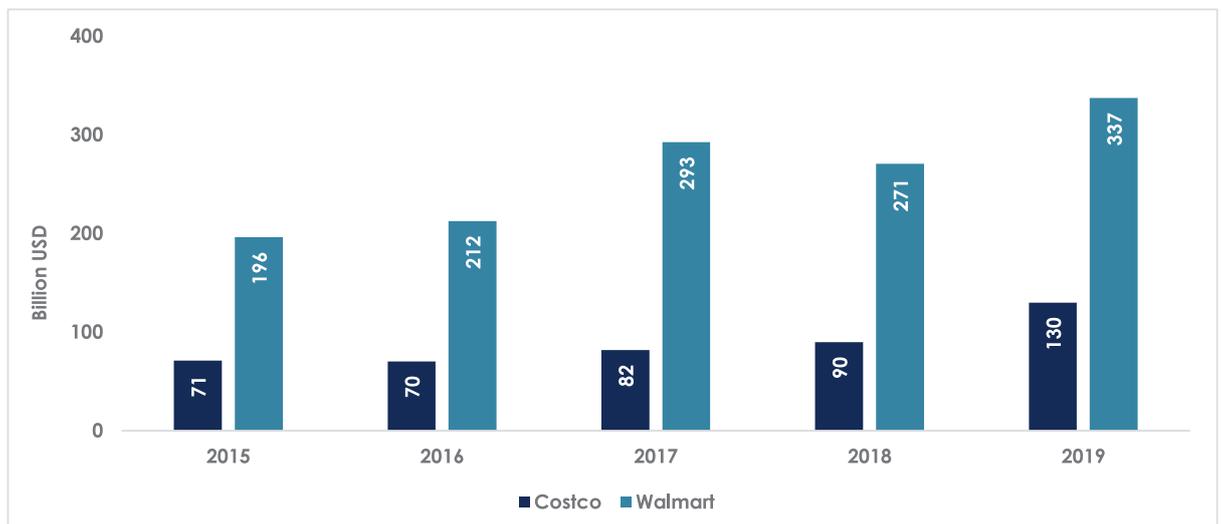
#### Total Annual Revenues



#### Totals Assets



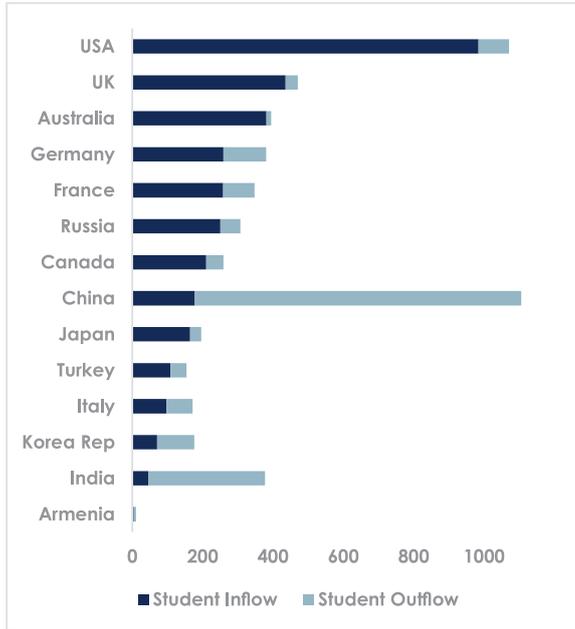
#### Market Capitalization



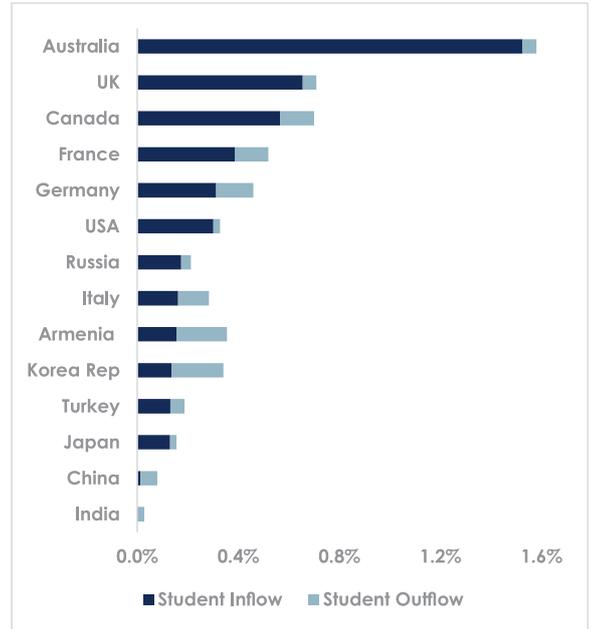
Source: Annual reports

Charts for Section 3

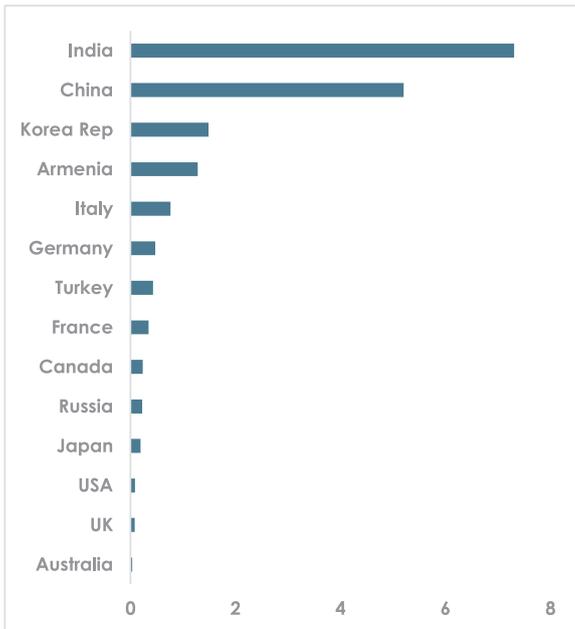
Flow of University Students, in thousands



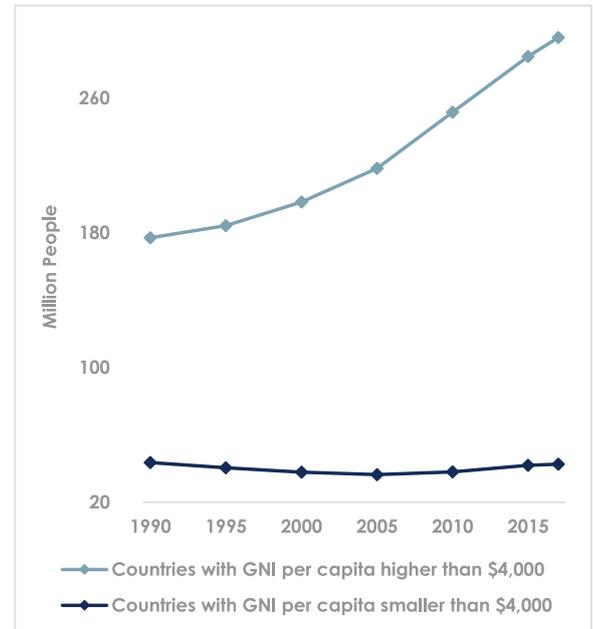
Flow of University Students (% of population)



Ratio of University Students Outflow over Inflow



People Immigrate to Rich Countries



Source: [Unesco](#), [World Bank](#)

International migrant stocks are defined as “the total number of international migrants present in a given country at a particular point in time” (UN SD, 2017: 9). We divided to two income groups according to World Bank classification.

Source: [UN](#)

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