INDUSTRIAL POLICY
A Scientific Journal Dedicated to Economic Development and Industrial Policy

OPEN ACCESS

Opinion Article
DOI: 10.61192/indpol.1386592

www.indpol.org
IndPol, 2023; 3(2): 04-11

Hacking Economic Development

Saip Eren Yılmaz[a]

[a]Winspyre OU, CEO, USA, ORCID: 0000-0002-4362-0045

Abstract

This paper explores the potential use of growth hacking as a prescriptive tool in development economics from a system dynamics perspective. Growth hacking is a popular business method, and it stands as the umbrella term for attaining exponential business growth by creating and harnessing non-linear dynamics by forming virtuous cycles with creative ideas, field experimentation, and fast feedback loops. In this sense, growth hacking is inductive, non-linear, and empirical, contrasting the economic literature's deductive, linear, and abstract frameworks. Given this rationale, growth hacking can yield prescriptive and actionable insights that create virtuous cycles, avoid vicious cycles, and regulate linear economic development. Also, this perspective led to a novel definition of the quality of growth. As an extension of this definition, three development archetypes are stylized as “active,” “passive,” and “sustaining” based on reflexivity characteristics of the underlying economic subsystems.

Article History
Received November 6, 2023
Accepted November 18, 2023

Keywords
Economic Development, Industrial Policy, Technology Policy, Venture Capital, Innovation

JEL Codes
F50, G24, L11

1. Introduction

Developing countries need realistic perspectives to tackle their economic challenges due to the ineffectiveness of mainstream economic thinking and its toolset for several reasons.

First, economics literature is primarily deductive, reductionist, and linear, often conducted from a historical perspective utilizing abstract constituents. To illustrate, constituents such as institutions, nations, states, markets, industries, and firms are abstractions. Their behavior is an emergent feature of individuals' actions and choices. Similarly, concepts such as technology, innovation, entrepreneurship, competitiveness, investment, and human capital are emergent aggregates of highly complex systems; hence they are not actionable. Therefore, ideas and models of economics literature function in unactionable aggregates and abstractions, yielding ex-post descriptive insights at best. In the words of Nobel laureate Paul Romer, “models attribute fluctuations in aggregate variables to imaginary causal forces that are not influenced by the action that any person takes” (Romer, 2016, p. 1). Additionally, the historical perspective embedded in economic thinking assumes sequential development steps, ignores future opportunities, and yields commoditized insights that are unlikely to bring faster-than-average development.

Secondly, the deductive nature of economic thinking leads to reductionist policy formulation and waterfall execution frameworks. To illustrate, unactionable aggregates in the form of monolithic abstractions, such as unemployment and inflation, are framed under vague causal chains and broken down into policies that lack the logistical clarity necessary for effective execution and impact evaluation. Such a top-down approach's coordination complexity, cost, and slowness are too hard to bear for developing countries. Moreover, this reductionist approach yields outputs that neglect the contextual affordances of individuals, especially those of the political agents, who are the real action-takers. By the same token, since the dissimilar contexts of individuals and institutions are ignored, a coordination problem arises almost to the effect of a paralyzingly complex cold-start problem that requires a magical reset.

Third, the economic development and growth literature offers consistent narratives that synthesize historical economic observations and fit models to the economic data. But developing countries often lack data. Even for developed economies, the reliability of economic data is questionable due to the analog, reactive, and survey-based approaches, which often show up as revisions after data releases and different organizations releasing contradicting data on the

CONTACT Saip Eren Yılmaz saiperenyilmaz@winspyre.com

same phenomena. To illustrate, for the second quarter of 2023, St. Louis FED and Atlanta FED of the USA looked at the same US economy and forecasted diverging GDP growth rates of -0.32% and 1.95%, respectively. Given the complexity of economic phenomena and models, it is viable to intuit that data quality issues build up and exponentially reduce model reliability.

Finally, economic literature is haunted by the fixation on building models with whatever data is available, creating a form of streetlight bias, which can be summarized as searching for answers in the wrong place simply because the data is there.

2. Three Types of Economic Growth

Gross domestic product (GDP) is the standard measure of the value added created by producing goods and services in a country during a certain period (OECD, 2023). Economic growth is mostly measured in terms of GDP growth as the reference point for the health of national and global economies (Callen, 2017). In this regard, GDP originates from a macro view that does not discern sweet spots and non-linearities.

To build on the virtues of growth hacking in economics, we must first define the term "growth" from a perspective that lends itself to the virtues of growth hacking, which operates from the lenses of system dynamics and in terms of non-linear concepts such as advantage, snowball effect, leverage, sweet spot, synergy, contagion, virtuous cycle, compounding, network effects, scalability, and automation.

The growth hacking mindset is not unusual. In the real business context, strategic management seeks growth by creating advantages by performing different activities from rivals or similar activities in different ways, and repositioning the business as imitation and strategic convergence erodes advantages (Porter, 1995). In the most generic sense, strategic management is a future-looking framework that seeks future advantages and continuously adapts to the changes in the life cycle of advantages. By this token, strategic management moves businesses into new advantages while exiting the old advantages. This stipulates business strategies that actively seek, reposition, and restructure businesses by inventing, discovering, and harnessing non-linear value creation pathways by the following means.

1. Creating new markets
2. Positioning for pricing power to lift the price of outputs
3. Positioning for bargaining power to suppress the cost of inputs
4. Business model innovations to
   - scale faster at a lower capital requirement
   - minimize operating leverage
   - reduce capital requirements and cost of capital
   - minimize risk exposure and costs of managing risks
   - minimize the cost of exit
5. Exit in a timely manner.

Given the level of global competition and how fast innovations disseminate, businesses that lack these five means are certain to get commoditized rapidly. Therefore, the quality of the growth is proportional to the extent to which these five means are materialized. This proposition leads to defining three archetypes of economic growth to characterize the higher-order system dynamics driven by the quality of growth.

1. **Active GDP Growth** originates from willful acts to create new markets and disrupt existing ones with competitive advantages and exponential business models involving virtuous cycles.
2. **Sustaining GDP Growth** originates from sustaining innovations, R&D, and productivity improvements within the existing markets and for the existing activities and products.
3. **Passive GDP Growth** originates from incumbents exiting some activities by downsizing, divesting, and offshoring. The void left behind by downsizing and divesting indirectly pulls passive growth while offshoring, and foreign direct investment (FDI) directly spoon-feeds passive growth.

In the following sections, active, sustaining, and passive growth archetypes are stylized to expose their underlying non-linear and/or circular dynamics (reflexive) and their associated social, political, and environmental effects to epitomize growth from a developmental perspective.

3. The Origins and Anatomy of Passive Growth

Passive growth originates from the exhaust of the incumbents' strategy process. Incumbents move into the emerging sources of advantage and exit the declining ones. Because from the incumbent's perspective, maximizing the capital returns depends on concentrating the capital on the most sensitive levers of advantage by exiting non-core businesses, products, and activities to focus on core ones that drive competitive advantage (Prahalad, Hamel, 1990). The resulting offshoring or outsourcing trend, its cross-industry pervasiveness, and its strategic, financial, and other rationale are shown in a myriad of studies (Vagadia, 2012, p. 82).

Passive growth of an economy can be stylized as being grown. It takes place in two pathways. The first pathway of passive growth emerges from the supply void left behind when incumbents downsize or divest the economic activities of declined business advantage. From the entrant perspective, this supply void offers an established market with minimal growth risks in terms of the market, technology, and operations and comes with the features of low entry barriers such as commoditized know-how, expired intellectual property, and increased access to and abundance of necessary capital goods. The second pathway of passive growth emerges

when the incumbents directly move economic activities into other jurisdictions by outsourcing, offshoring, or direct investments to build offshore capacity. In both pathways, passive growth follows the path of least effort, does not entail business vision to obtain, and leads to the growth of economic activities with low or no competitive advantage.

In addition to their perceived constraints and deficiencies, developing economies face internal pressures to grow rapidly, create jobs, and finance infrastructure gaps as fast as possible. Given the political and social urgencies of developing economies, it typically looks super appealing to grow fast regardless of the growth's origin, path, and destination. With this bias for the speed of growth and the tendency to follow the path of least effort, passive growth economies can grow from ~$2.000 per capita GDP to ~$10.000 as fast as 13 years in the example of Romania and 14 years in the example of China.

Table 1. Fastest growth periods from $2.000 per capita GDP to $10.000

Country Name	GDP Per Capita		Years
	Between $1900-$2500	Between $10.000-$11.500	
Romania	2002	2014	13
China	2006	2019	14
Poland	1991	2007	17
Korea, Rep.	1982	1999	18
Chile	1988	2007	20
Mexico	1988	2008	21
Malaysia	1990	2011	22
Türkiye	1989	2010	22

Source: World Bank Database

In this sense, passive growth resembles feeding sugar to cancer cells and leads to a set of vicious cycles. Passive growth pulls an economy into economic activities with little or no competitive advantages and industries with low entry barriers. These industries are almost always working capital-intensive with minimal margins, so the working capital profitability is inherently low, sometimes lower than the cost of capital. Thus, any marginal economic activity destroys capital, even excluding capital expenditure. Similarly, some low-barrier industries require high operating leverage due to the technical nature of the business or the importance of economies of scale. Thus, these industries are susceptible to fluctuations in demand at multiples of their operating leverage.

When the first pains of the working capital kick in, the easiest managerial reaction is to push for more growth, which can be named as working capital ponzi. Since firms are networked with trade finance, the working capital ponzi is contagious. Preys of working capital ponzi draw their business partners to the ponzi by extending payment terms while increasing business activity. Eventually, in a few years, if not a decade, while the commodities they produce are further commoditized, passive growth participants collectively become addicted to the proceeds of future orders to finance current operations and get overleveraged, leading to their total capitulation vis-a-vis their customers.

Passive growth is often accompanied by a lack of public institutional capacity, especially in regulating the banking industry, capital markets, labor markets, and the environment. This lack of institutional capacity leads to simplistic policy responses in times of crisis. On the other hand, low-entry barrier industries have little or no competitive advantage. Thus, they can stay alive and grow only as a function of an ever-weakening local currency, efficiency of inhumane working conditions, government subsidies, and cost-avoidance of environmental ignorance, all catered by institutional incapacities. In a passive growth economy, when the situation worsens for too-big-to-fail firms, these firms are given charitable loans from state banks, which destroys banking capital. If the macro economy worsens, market forces lift inflation, or regulators commit devaluation, killing all domestic productive factors without discrimination. Making matters worse, to stay functioning, passive growth industries require imported capital goods and services, and even imported inputs, which become increasingly expensive as the local currency loses value. While firms survive by exploiting institutional incapacities, individuals of passive growth economies survive via cronyism, corruption, and nepotism, which leads to the social and political normalization of all these resorts. Ultimately, survival of the fittest replaces survival of the best, discouraging meritocracy and accelerating the brain drain. Overall, the resulting social dynamics of passive growth stretch inequality, drain the domestic talent pool, and create a small number of the super-rich and millions of people living at the threshold of capitulation, which overlays on the political populism that kicks in every five years but usually more frequently due to the inherent political instabilities.

The main factor that led so many economies to fall prey to passive growth was the low policy rates of the G7 countries in response to the 2008 financial crisis. The low-interest rates of developed countries created an interest rate differential from those of developing economies which ultimately induced massive hot money outflows toward developing economies (McKinnon & Liu, 2013). In the 2008-2015 period, the very

low world funding interest rates were associated with a rise in volatile capital flows and asset market bubbles in fast-growing emerging markets (Andreas, 2014). These financial propositions support the notion of passive growth in the sense of "being grown" by external forces. The second factor that boosted global passive growth was the rapid growth journey from ~$2000 per capita GDP to ~$10.000 seemed like the passive growth economies were achieving miracles. As the money flows financed passive GDP growth, fueled asset bubbles, and appreciated domestic currencies, a false sense of wealth emerged, alleviating the accompanying social pains, almost like a painkiller. The third factor was the reinforcing loop between the rich world's excessive consumption and the deflationary forces served to the rich world by the passive growth economies. Due to these three factors, passive growth economies have been so sure about their policies that they compete by offering more incentives and subsidies for more passive growth.

Economists study the middle-income trap with the assumption that the economies in the league of middle-income aspire to pass the middle-income tier. From the passive growth lenses, it seems reasonable to intuit that once an economy falls into the passive growth path, the system of forces evolves to be stronger at staying in the middle-income tier, which is the passive growth version of development, almost to the effect of developing to be better at staying poor. Because, just as unconsciously as they were pulled into passive growth path, economies of passive growth watch the emergence of a system of exploitation and control, which fundamentally contradicts the necessary dynamics to progress people's wealth and health.

It is tempting to frame passive growth within a cost leadership strategy relying on productivity gains by industrial engineering, automation, lean methods, and optimization. However, these productivity gains are unlikely to provide long-term profits because productivity is not an advantage. First, from the cost perspective, profits driven by cost reduction are transitory until the next best competitor adopts productivity techniques with the same cost-reduction effect. Second, productivity follows a path of diminishing returns which converge costs to a hard limit.

Third, from the pricing perspective, passive growth industries are price takers, so their productivity gains are transferred to their customers as deflation. Last but not least, if a product is a commodity now, it will get commoditized further in time and lose its market value, usually faster than the extent to which productivity gains can offset.

A combination of capital scarcity fallacy, sequential development fallacy, and political urgency drives a powerful conviction for passive growth. Since most developing economies suffer capital deficits, low-barrier industries seem more feasible due to low entry requirements regarding financial capital and technological readiness. From a political urgency perspective, the relative ease and speed of achieving passive growth are irresistible. However, passive growth traps scarce capital into unprofitable businesses, pollutes the environment, concentrates power, normalizes corruption, and wastes precious opportunities while new markets emerge.

All in all, passive growth destroys more capital than it creates. Nevertheless, even if we assume passive growth leads to some capital accumulation, it is a slight linear accumulation in an exponential world of active growth. Even if we assume passive growth leads to exponential capital accumulation, this capital is accumulated in the hands of the few, more likely to be banking offshore than domestically to hedge political risks and minimize tax burden (Alberto & Tabellini, 1989). This capital flow to foreign jurisdictions feeds foreign economies while starving the domestic economy as exemplified in the example of Russia, where the wealth held offshore by rich Russians is about three times larger than official net foreign reserves and is comparable in magnitude to total household financial assets held in Russia (Novokmet et al., 2018, p. 1). Even if we assume capital flight is prevented and kept domestically, it will likely be spent on building unproductive wonders (Al-Hathloul, 2022) and wasted by corruption and inefficiency (Jimoh et al., 2022, pp. 17-18). From this perspective, it might be viable to formulate policies that restrain passive growth.

4. Origins and Anatomy of Sustaining Growth

Sustaining growth originates from sustaining innovations, research & development, and productivity improvement within the existing markets for the existing products and activities. Sustaining growth occurs in established markets via linear business competition, often showing diminishing returns. It can be stylized as a failure to exit old markets and create new ones in a timely manner. In this sense, economies dominated by sustaining growth show strong R&D spending in old markets but weak venture capital investments in new markets. Taiwan, Japan, Italy, South Korea, and Germany can be considered economies of sustaining growth, as shown in Table 2.

Table 2. Global share of R&D and Venture Capital investments from 2013 to 2022

Countries	Share Of Global R&D Expenditure 2013-2022 (A)	Share Of Global VC Investments 2013 -2022 (B)	A / B
Taiwan	2.03%	0.14%	14.90
Japan	8.53%	0.71%	12.09
Italy	1.60%	0.19%	8.29
S. Korea	4.62%	1.57%	2.94
Germany	6.12%	2.37%	2.58
Global 25th Percentile	0.89%	0.50%	1.78

Source: World Bank, Dealroom & Statista.

Unlike developing economies, developed economies are not short of capital, technology, and infrastructure. Also, unlike developing economies, developed economies do not face the political urgency to create jobs and pull millions of people out of absolute poverty in a short time. However, developed economies such as Japan, the UK, and Germany missed major opportunities for active growth since the 1990s, such as the internet businesses, cloud technologies, electric vehicles, smartphones, and artificial intelligence, and they stuck with the markets, products, and services of the past. A sole focus on sustaining growth comes with massive opportunity costs of losing new markets. To illustrate, as of May 2023, with a market capitalization of $2.7T, Apple Inc. alone is more valuable than the entire UK stock market ($2.6T), Chinese stock market ($2.5T), Canadian stock market ($2.1T), French stock market ($1.8T) and German stock market ($1.3T) (Pisani, 2023).

For developed economies, missing new markets mainly stems from the disproportional growth in industries with high exit barriers. The establishment of too big and hard-to-disrupt industries creates a distaste and denial of emerging opportunities of a disruptive nature. Also, the social context of welfare and political stability inhibits the appetite to seek new endeavors. Aging demographics disadvantage the entrepreneurial ecosystem while fostering a shareholder profile that prefers extracting value rather than fueling growth by taking risks. The combination of a risk-averse management profile and an academic leadership style biased toward overthinking and underacting might also be a factor.

5. Origins and Anatomy of Active Growth

Active growth originates from willful acts to create new markets and disrupt existing ones with strong competitive advantages and exponential business models involving virtuous cycles. Origination of active growth only and only requires strategic intelligence, imagination, willfulness, and risk-taking. It is tempting to assume financial capital, human resources, technology, regulation, and infrastructure are prerequisites to the origination of active growth, but they are not. The factors of strategic intelligence, imagination, willfulness, and risk-taking come first; then, these factors acquire or develop missing factors and influence unfavorable ones. Therefore, active growth intrinsically drives progress and builds positive externalities in the broader economy and society.

Active growth builds exponential businesses and multiplies itself by spreading its seeds. Prominent examples of this multiplication are how Paypal paved the path for Palantir, Facebook, Tesla, SpaceX, and Linkedin, how Amazon led to Blueorigin, and how Tesla alumni, also known as Tesla-mafia, founded 11 influential companies (John, 2021). But the multiplicative effects of active growth are more sweeping than strategic entrepreneurship. The industrial policy can initiate active growth as well. Some policy-led examples of active growth are as follows,

- NASA's Appollo and Pentagon's ARPANET programs led to the emergence of the tech spree and the Silicone Valley as we know it today (Haigh, 2019)
- National Institutes of Health's Human Genome Project of 2000 led to the emergence of the biotech boom, contributing over $69 billion to the U.S. GDP each year and supporting over 7 million jobs (Gitlin, 2021).
- Danish focus on wind energy started around the 1970s leading to Vestas's emergence as the biggest wind turbine manufacturer in the world, surpassing big names such as GE of the USA and Siemens of Germany (Van Est, 2022, pp. p45-65).
- Estonia's focus on digital businesses started in 2000, acknowledging access to the internet as a fundamental human right. Estonia has more unicorns per capita than any other country ("Estonia has the most unicorns," 2022) and is the 3rd best in the world in cyber security (Vihma, 2022).
- Turkiye's focus on the defense industry led to the country's emergence as a drone superpower (Axe, 2022) and a one-stop-shop for almost anything in the defense industry (Malsin & Kivilcim, 2022).
- A more recent and exciting example is Luxembourg's focus on the space mining industry (e Selding, 2022) and El Salvador establishing Bitcoin as a legal tender (Belsie, 2022).

The exponential nature of active growth combined with its positive externalities and contagious mindset develops a system of virtuous cycles through capital accumulation, formation of venture capital, human capital, dissemination of futurist views, a winning culture, an attractive lifestyle, and progressing science & technology. This reflexivity leads to the emergence of innovation hubs such as Silicon Valley, Tel Aviv, Toronto, Melbourne, Tallinn, and Shenzhen (Gauthier, 2022).

Active growth deals with the knowledge frontier and requires talented human resources, which is always scarce due to the novel and advanced skills needed for active growth. This scarcity creates a new class of workers with high salaries complemented by equity premiums, which often exponentially increase in value. In parallel, in most major economies, real wage grows slower than asset prices; therefore, the legacy definition of middle-income jobs in the manufacturing industry needs to be questioned. It is viable to intuit that only active growth can create the compensation to afford the legacy life standards attributed to the middle income.

6. The Proposed Approach

6.1 Establish a sovereign venture fund

For an underdeveloped country, it might take a decade to develop its local active growth economy to reach a material scale. However, direct investment in active growth through a sovereign venture fund can be a shortcut to gaining exposure to active growth. This will offer a significantly higher return on investment than investments in primitive forms of local industries. To illustrate, a poor country can export wheat and invest proceeds into quantum computing stocks.

The governance and transparency of the sovereign venture fund might be challenging. But, still, it is a significantly more manageable challenge than catching up with the rest of the world through a sequential development process from farming to industrialization to the digital age.

For middle-income countries, the sovereign venture fund shall foster local innovation in selected areas of concentration for businesses qualify on the five means of competitive advantage outlined in the introduction. As a side benefit, such a sovereign fund investing in local innovation will create a sense of developmental citizenship as each citizen will have a shared stake in the country's future and innovation potential.

6.2 Develop a global market intelligence ecosystem

The essence of developmental hacking is to achieve continual pricing power and positioning for advantage by successfully exiting the declining advantages while entering the emerging advantages, which can only be guided by an effective market intelligence ecosystem that ideates, researches, and analyzes the future. This ecosystem includes market research firms, data aggregators, think tanks, consulting firms, and venture capital.

6.3 Grow a global political network of developmental citizenship

Most strategies and policies are designed deductively and represented by the waterfall methodology, which leads to a reductionist and linear perspective that sets goals and actions for governmental or private organizations. This approach is inherently reactive, slow, fragile, and prone to ineffectiveness and infeasibility.

This paper regards real actions and choices of individuals as the fundamental and only driver of progress. Therefore, a persona-based inductive framework is required to tilt everyday choices and actions of like-minded individuals in the same progressive and synergistic direction and leave the optimization of choices and actions to individuals, given their contextual affordances, implications, and tradeoffs.

The personas of this framework might involve bureaucrats, citizens, politicians & activists, thought leaders, business leaders, and investors as some of the key personas of developmental significance. Each persona shall be associated with behavioral norms and social feedback. To illustrate, the social norm for American billionaires is to fund further innovation, do philanthropy, and build infrastructure for the next generation monopolies, as exemplified by Elon Musk and Jeff Bezos, who are building the space infrastructure.

6.4 Use diplomacy, culture, and lobbying for a polished, progressive & peaceful economic brand

Competition for the new markets and monopolies of the future requires surgical execution and hygiene. There is no tolerance for even minor handicaps that negatively bias the future customers, partners, allies, and financiers. Similarly, a polished, progressive, and peaceful economic brand will positively bias future collaborators.

6.5 Evangelize a developmental culture

A culture of credibility and progress is foundational to cultivating development.

Regarding the culture of credibility, business ethics, and work discipline are foundational to flourishing a culture where trust is granted, and suspicion is earned. This type of credibility culture is exemplified by founders and venture capitalists not needing non-disclosure agreements in most cases, and investment deals initiated on a single-page term sheet with a few bullet points.

Regarding the culture of progress, as exemplified in all successful innovation hubs, imagination, hope, confidence, risk-taking, celebrating failures, and grit are vital attitudes that must be normalized. This set of attitudes, tested and proven in real life in many different geographies, should be taught and

displayed as art forms such as movies and TV series. Similarly, business leaders should accordingly exemplify and reinforce the culture of progress within their purview.

6.6 Evangelize advantage-seeking business thinking and execution

Strategy, despite being an inescapably popular term in business, is rarely understood as a process to create and sustain advantage in a competitive and comparative environment. Therefore, it is critical to evangelize the advantage-seeking hard-core strategic mentality among business leaders.

6.7 Restrain passive growth and regulate sustaining growth

Passive growth should not be the primary driver of the economy and should be kept under control at a manageable size that doesn't drive the overall characteristics of the economy, society, and politics. On the other hand, the national capital should not be trapped in sustaining mode and should not grow into a too-big-to-disrupt size.

References

Al-Hathloul, L. (2022, March 1). Dictators in Egypt and Saudi Arabia love smart cities projects — Here's why. Retrieved June 14, 2023, from https://www.accessnow.org/smart-cities-projects

Alberto, A., & Tabellini, G. (1989). External debt, capital flight and political risk. Journal of International Economics, 27(3), p199-220. https://doi.org/10.1016/0022-1996(89)90052-4

Andreas, H. (2014). Zero-interest Rate Policy and Unintended Consequences in Emerging Markets. The World Economy, 37(10), p1367-1387. https://doi.org/https://doi-org.ezproxy.bu.edu/10.1111/twec.12199

Axe, D. (2022, January 29). How Turkey Became a Drone Superpower. National Interest. Retrieved June 12, 2023, from https://nationalinterest.org/blog/reboot/how-turkey-became-drone-superpower-199998

Belsie, L. (2022, July 7). El Salvador's Experiment with Bitcoin as Legal Tender. Retrieved June 15, 2022, from https://www.nber.org/digest/202207/el-salvadors-experiment-bitcoin-legal-tender

Bower, J. L., & Christensen, C. M. (1995). Disruptive Technologies: Catching the Wave. Harvard Business Review, Vol. 73(Jan/Feb), p43-53. https://doi.org/https://hbr.org/1995/01/disruptive-technologies-catching-the-wave

Callen, T. (2017). Gross Domestic Product: An Economy's All. Finance & Development, 2017(5), 14-15. https://doi.org/10.5089/9781484320921.022

E Selding, P. B. (2016, February 3). Luxembourg to invest in space-based asteroid mining. Retrieved August 23, 2022, from https://spacenews.com/luxembourg-to-invest-in-space-based-asteroid-mining/

Estonia Government (2022, December 1). Estonia has the most startups per capita in Europe. Invest in Estonia. Retrieved June 12, 2023, from https://investinestonia.com/estonia-leads-europe-in-startups-unicorns-and-investments-per-capita/

Gauthier, J. (n.d.). The Global Startup Ecosystem Report 2022. https://startupgenome.com/article/rankings-2022-top-100-emerging-ecosystems

Gitlin, J. M. (2013, December 6). Calculating the economic impact of the Human Genome Project. Retrieved June 15, 2023, from https://www.genome.gov/27544383/calculating-the-economic-impact-of-the-human-genome-project

Haigh, T. (2019). Hey Google, what's a moonshot?: How Silicon Valley mocks Apollo. Communications of the ACM, 62(1), p24-30. https://doi.org/https://doi-org.ezproxy.bu.edu/10.1145/3292519

Jimoh, I., Loch, C., & Sengupta, K. (2022). How Megaprojects Are Damaging Nigeria and How to Fix It: A Practical Guide to Mastering Very Large Government Projects (1st ed., pp. 17-18). Springer Nature. https://doi.org/10.1007/978-3-030-96474-0

John, A. (2021, May 11). 11 Tesla engineers who left Elon Musk's company to run startups driving the auto industry into an electric future. Retrieved June 15, 2023, from https://www.businessinsider.com/11-tesla-alumni-who-started-electric-mobility-startups-2021-11.

Malsin, J., & Kivilcim, E. (2022, January 29). How Turkey Became A Global Player in Arms

Manufacturing. Retrieved August 23, 2022, from https://www.wsj.com/story/how-turkey-became-a-global-player-in-arms-manufacturing-a1c361f0.

McKinnon, R., & Liu, Z. (2013). Zero Interest Rates in the United States Provoke World Monetary Instability and Constrict the US Economy. Review of International Economics, 21(1), p49-56. https://doi.org/https://doi-org.ezproxy.bu.edu/10.1111/roie.12019

Novokmet, F., Piketty, T., & Zucman, G. (2018). From Soviets to Oligarchs: Inequality and Property in Russia 1905-2016 (1st ed., p. p1). World Inequality Lab. https://doi.org/10.1007/s10888-018-9383-0

OECD (2023, January 1). Definition of Gross Domestic Product (GDP). Retrieved June 14, 2023, from 10.1787/dc2f7aec-en

Pisani, B. (2023, May 10). Apple versus the world: The iPhone maker is bigger than almost any stock market in the world. Retrieved June 14, 2023, from https://www.cnbc.com/2023/05/10/apple-vs-the-world-apples-bigger-than-entire-overseas-stock-markets-.html

Porter, M. E. (1995). What Is Strategy? Harvard Business Review, 74(6), p61-78. https://doi.org/https://hbr.org/1996/11/what-is-strategy

Prahalad, & Hamel, G. (1990). THE CORE COMPETENCE OF THE CORPORATION. Harvard Business Review, 68(3), 79–91.

Romer, P. (2016, September 14). The Trouble With Macroeconomics [Commons Memorial Lecture of the Omicron Delta Epsilon Society]. Stern School of Business, New York University. https://paulromer.net/trouble-with-macroeconomics-update/WP-Trouble.pdf

Vagadia, B. (2012). Outsourcing Within Industry Verticals (1st ed., p. 82). Springer Berlin, Heidelberg. https://doi.org/https://doi-org.ezproxy.bu.edu/10.1007/978-3-642-22209-2

Van Est, R. (2022). Successful Public Policy in the Nordic Countries: Cases, Lessons, Challenges (1st ed., pp. p45-66).

Oxford University Press. https://doi.org/10.1093/oso/9780192856296.003.0003

Vihma, P. (2022, January 15). Estonia outranks most of the world in Global Cybersecurity Index. E-Estonia.com. Retrieved June 12, 2023, from https://e-estonia.com/estonia-outranks-most-of-the-world-in-global-cybersecurity-index/#:~:text=Estonia%20is%20highly%20ranked%20also,cybersecurity%20index%20average%20(42.71).