Examining Economic Growth Through Brand Development: A Multinational Analysis

Dila Asfuroglu1, Nuriye Zeynep Ökten2, and Elif Yolbulan Okan1

Abstract
Due to the increasing importance of human capital for economic growth, this article aims to clarify the relationship between economic growth and human capital by concentrating on the growth effects of an average number of brands in the economy. An endogenous growth model where branding emerges as the “growth engine” of the economy is followed by a quantitative analysis regarding the relationship between brands and economic growth. The findings suggest that developing countries should shift from traditional mass production to high value-added production, such as brand development, to achieve a similar economic performance in developed countries.

Keywords
brand development, economic growth, human capital, brand value

JEL classifications: C40, M30, O34, O41

Introduction
Growth has always been a major motivation for both companies and national economies all around the world. In the industrial period, driving forces behind the economic growth were primarily physical resources, whereas in the 21st century, the importance of these resources has decreased leading to a shift from tangible and physical resources to intangible and intellectual resources in both microeconomic and macroeconomic levels.

The importance of intangible capital was recognized in “Lisbon process” (European Commission, 2010) and has been acknowledged for sustainable, smart, and inclusive growth by the European 2020 strategy. An analysis by World Bank Group with regard to the total wealth of countries states that 78%1 of the world’s wealth is created by intangible capital. Although there is a consensus on the rising importance of intangible capital for economic growth, there is still an ongoing debate on the methodology for measuring the degree, timing, and duration of the relation between intangible capital and the economic growth. On one hand, some studies2 find intangible or intellectual capital as an important economic driver and indicate the positive effect of intangible capital on economic growth in different countries.3 On the other hand, some studies,4 still argue that there is a lack of support to prove the economic effects of intangible capital. These contradictory findings point out a necessity for more research on the relation between economic growth and intangible capital using alternative methodologies and metrics. Hence, in this article, we aim to shed light on this relationship by concentrating on the growth effects of an average number of brands in the economy.

According to the Organization for Economic Co-Operation and Development report (OECD, 2011), intangible assets, knowledge asset, and intellectual capital terms can be used interchangeably, and the content of intangible assets gets broader, ranging from computerized information (i.e., databases and software), economic competencies, such as human capital, brand equity, and know-how to innovative property including trademarks, R&D, and copyrights. Following this, the current study uses branding as a form of human capital so that the analysis regarding the effects of branding on economic growth can be conducted. In doing so, the theoretical framework introduces branding to the Uzawa-Lucas–type growth model as the additional sector, contributing to manufacturing (i.e., goods production) as an input. Intuitively, for

---

1 Bahçeşehir University, Istanbul, Turkey
2 Istanbul Okan University, Istanbul, Turkey

Corresponding Author:
Dila Asfuroglu, Bahçeşehir University, Faculty of Economics, Administrative and Social Sciences, Çırşan cad. No: 4-6, İstanbul 34353, Turkey.
Email: dila.asfuroglu@eas.bau.edu.tr

Creative Commons CC BY: This article is distributed under the terms of the Creative Commons Attribution 4.0 License (https://creativecommons.org/licenses/by/4.0/) which permits any use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (https://us.sagepub.com/en-us/nam/open-access-at-sage).
brands to appear, first, there has to be a standard goods production. This, in turn, will transform the economy into a certain development level allowing for the allocation of educated agents and more time to sectors other than goods production (i.e., branding). Once this additional sector of human capital is established and grows, it further affects the output growth by positively influencing the average branding in the economy in the form of a positive externality. For a positive externality to exist, the production is required to generate spill-over benefits to the economy. In this sense, this article argues that branding with high-quality differentiated products that are produced by well-educated, creative know-how contributes to the overall economic growth.

From the quantitative perspective, our aim is, first, to justify the formation of human capital as brands. The positive correlation coefficient of human capital index (HCI) and the number of brands supports the argument that brand development is a factor input of the goods production firms. Then, the effect of valuable brand development on GDP per capita is analyzed highlighting the strength of the relationship. The positive correlation on this relation is demonstrated in all categorizations in terms of countries. Considering that there are only eight emerging market economies, almost all having only one brand, in the Brand Finance Global 500 List, the positive linear co-movement in this relation suggests that the commitment to an increased brand development process for the emerging markets is vital for achieving greater economic performance.

The remainder of the article is organized as follows. Next section introduces the endogenous growth model where branding emerges as the “growth engine” of the economy. It is followed by a quantitative analysis section. Finally, the last section concludes with a policy recommendation.

**Theoretical Model**

Anholt (2005) points out that brands are the sum of intangible competitive assets of countries or organizations which resemble the distinctive character of the promises. Intangible resources, that is, human capital, include assets that create values contributing to and sustaining economic growth. In this respect, Uzawa-Lucas-type growth model is extended to embody branding as a form of human capital so that the analysis regarding the effects of branding on economic growth can be conducted. The agents have to choose how to allocate their human capital between two production sectors due to the rivalry property of the human capital. In goods production sector, there is one good used for consumption and physical capital investment; and brands are created in brand sector. While production sector uses brands and physical capital as inputs, brand development does not rely on physical capital. This assumption, other than simplification, is made to emphasize the intensity of the human capital input, which refers to a skill level of individual acquired via formal education, learning by doing and know-how, in the brand sector.  

A representative firm in the goods production sector produces according to $Y_t = AK_t^\alpha H_{pt}^{-\alpha} h_t^\gamma$ where $A > 0$, $0 < \alpha < 1$ and $\gamma \geq 0$. $Y_t$ is the output, $K_t$ denotes physical capital, $H_{pt}$ represents the number of brands, and $\alpha$ is the share of the physical capital. Total factor productivity, $\delta_t$, is assumed to be constant, $A$. Following the idea of Lucas (1988), it is argued that the average branding of the economy, represented as an externality, contributes to the total factor productivity in the production sector. If $\gamma > 0$, there is an external effect from the level of average branding, $\bar{h} = H_t / L_t$, average number of brands per person. Hence, $\gamma$ can be thought as the degree of the external effect of branding; and in return, $h_t^\gamma$ measures the externality associated with the average number of brands. Labor supply, $L_t$, is assumed to grow according to $L_t = L_t^0 e^{\sigma n}$ with $n \geq 0$. The homogeneity in the brand sector implies that the creation of brands across the sector is the same, $\bar{h}$; and the same fraction, $u_t$, of non-leisure time is devoted to goods production. The latter indicates that the individual skill level, $h_t$, such as process of developing new brands out of an existing brand, equals the average skill level, $\bar{h}$ (i.e., the average of all brands). The latter indicates $H_t = u_t h_t L_t$ and together with the former, it also implies that the effective work, $u_t h_t$, is the same across brands. Then, production function can be written as follows $Y_t = AK_t^\alpha (u_t h_t L_t)^{-\alpha} h_t^\gamma$.

The remaining non-leisure time, $1 - u_t$, is used for leaning on activities that contributes to branding. Hence, branding evolves according to $\dot{h}_t = B_t (1 - u_t) h_t - \delta_t h_t$ in per capita terms. Productivity in this sector is assumed to be constant, $B > 0$; and $0 \leq \delta_t < B$. Brands depreciate with $\delta_t$ depreciation rate because as in physical capital, individuals can forget some information or suffer from mental decline; knowledge may not be immediately transferred to other individuals; practices in brand creation might become outdated; and developed trademarks may not keep up with outgoing innovation, and so on. Rivalry property, intuitively, implies that the development of a valuable brand requires long hours of brainstorming, identifying target consumers, finding catchy slogans and so on instead of reserving time for the assembly line. While assigning a larger share of time to goods production directly affects output positively, allocating more time to brand creation has a direct positive influence on average number of brands developed.

The physical capital accumulation equation is given by $\dot{K}_t = Y_t - C_t - \delta_t K_t$, where $C_t$ represents consumption and $\delta_t$ is the physical capital depreciation with $\delta_t \geq 0$. In order to express the above equation in per capita terms, use the following transformation, $\dot{k}_t = \dot{K}_t / L_t$; so that $\dot{k}_t = y_t - c_t - (\delta_t + n) k_t$. Following the same approach, output can be written as $y_t = AK_t^\alpha (u_t h_t L_t)^{-\alpha} h_t^\gamma$. The utility of the representative household in per capita terms is $\int_0^c ((c^{-\alpha} - 1) / (1 - \sigma) L d, \sigma$ is the inverse of the intertemporal elasticity of substitution in
consumption, and the subjective discount rate is assumed to be \( \rho > n \). Then, the decision problem of the social planner is as follows

\[
\max_{\frac{c^*}{c}} \frac{e^{c^*/(\rho - n)}}{1 - e^{-c^*/(\rho - n)}} \, d_i
\]

subject to \( \dot{k} = A k^\rho (u, h) h^{-1 + \alpha} h' - c_i - (\delta_k + n)k_i \)

\[ \dot{h} = B (1 - u_i) h_i - \delta_h h_i \]

\[ c_i > 0, \, 0 \leq u_i \leq 1, \, k_i \geq 0, \, h_i \geq 0 \]

Since the benevolent social planner internalizes the effects from the average branding (i.e., takes into account the externality related with branding), \( \dot{h} \) can be replaced by \( h \). Hence, the current-value Hamiltonian becomes

\[
H = \frac{e^{c^*/(\rho - n)}}{1 - e^{-c^*/(\rho - n)}} + \lambda_k [A k^\rho (u) h^{-1 + \alpha} h' - c_i - (\delta_k + n)k_i] + \lambda_h [B (1 - u_i) h - \delta_h h_i] \]

where \( \lambda_k \) and \( \lambda_h \) are the co-state variables (i.e., shadow values) of physical input per capita and branding per capita, respectively. An interior solution requires the following first-order conditions:

\[
\frac{\partial H}{\partial c} : c^* - \lambda_k = 0
\]

\[
\frac{\partial H}{\partial u} : \lambda_k (1 - \alpha) A k^\alpha u^{-1 + \alpha} h' - \lambda_h B h = 0
\]

\[
\frac{\partial H}{\partial k} : \lambda_k [\alpha A k^\alpha (u) h^{-1 + \alpha} h' - (\delta_k + n)] = -\dot{\lambda}_k + (\rho - n) \lambda_k
\]

\[
\frac{\partial H}{\partial h} : \lambda_k [(1 - \alpha) A k^\alpha u^{-1 + \alpha} h'] + \lambda_h [B (1 - u) - \delta_h] = -\dot{\lambda}_h + (\rho - n) \lambda_h (*)
\]

\[
\frac{\partial H}{\partial h} : \lambda_k [(1 + \gamma) A k^\alpha u^{-1 + \alpha} h'] - \lambda_h [B (1 - u) - \delta_h] = -\dot{\lambda}_h + (\rho - n) \lambda_h (**)
\]

First two equations are first-order conditions with respect to control variables, whereas the first-order conditions with respect to \( k \) and \( h \) show derivatives with respect to state variables. The difference between the last equations (*) and (**) is that while the former refers to the first-order condition of the decentralized solution, the latter gives that of centralized. Since the social planner’s perspective is adopted here, calculations proceed with the equation for the derivative of centralized case. These equations can be expressed as follows as well:

\[
c^* = \lambda_k
\]

\[
\frac{\lambda_k}{\lambda_h} = \frac{(1 - \alpha) A k^\alpha u^{-1 + \alpha} h'}{B h}
\]

\[
-\dot{\lambda}_k = \alpha A k^\alpha (u) h^{-1 + \alpha} h' - (\delta_k + n) \rho - n
\]

\[
\frac{\lambda_h}{\lambda_k} = \frac{\lambda_h (1 - \alpha + \gamma) A k^\alpha u^{-1 + \alpha} h'}{B (1 - u) - \delta_h} + (\rho - n)
\]

Finally, the necessary transversality conditions ensure that over-accumulation of assets cannot occur:

\[
\lim_{t \to +\infty} k^\epsilon_t e^{(\rho - n)t} = 0
\]

\[
\lim_{t \to +\infty} h^\epsilon_t e^{(\rho - n)t} = 0
\]

To find the output growth in terms of parameter values, a balanced growth path analysis is required. By utilizing logarithmic differentiation with respect to time (i.e., calculating growth) and combining the resulting equations, balanced growth expressions can be attained. Starting from equation (1) and combining the logarithmic time differentiation of it with equation (3), one would get

\[
\frac{\dot{c}}{c} = \frac{1}{\sigma} [\alpha A k^{\alpha - 1} (u) h^{-1 + \alpha} h' - \delta_k - \rho]
\]

where growth of consumption \( g_c \) is represented as \( \dot{c}/c \). Since along the balanced growth path, growth rates have to be constant, this requires \( \dot{c}/\dot{k} \) to be constant as well. Suppose that \( \dot{k} = k / u \), then \( \dot{c}/\dot{k} = \alpha A k^{\alpha - 1} h' = \alpha A k^{\alpha - 1} (\dot{k}/\dot{k}) \)

where \( k \) is the capital per effective labor accounted for externality. \( \dot{c}/\dot{k} \) is constant only if \( \dot{k} \) is constant, revealing that \( \dot{k} \) is constant in balance growth path.

Suppose that ratio of shadow prices (i.e., equation (2)) is denoted by \( \Lambda \) and using \( \dot{k} \) expression:
\[ \Lambda = \frac{\lambda_n}{\lambda_n} = \frac{(1 - \alpha) A k^u u^{-\alpha} h^{-1} \alpha}{B h} = \frac{(1 - \alpha) A k^u u^{-\alpha} h^{-1} \alpha}{B h} = \frac{(1 - \alpha) A \bar{k}^u u^{-\alpha} h^{-1} \alpha}{B h} = \frac{(1 - \alpha) A \bar{k}^u u^{-\alpha} h^{-1} \alpha}{B h} \]

Taking logarithm, differentiating with respect to time and combining the fact that constant \( k \) means \( S_T = 0 \) with \( h_t = B_t(1 - u_t) h_t - \delta_s h_t \) implies

\[ \frac{\dot{\Lambda}}{\Lambda} = \frac{\dot{\alpha} k}{k} + \gamma \frac{h}{1 - \alpha} h = \frac{\gamma}{1 - \alpha} h = \frac{\gamma}{1 - \alpha} h \left[ B(1 - u) - \delta_s \right] \quad (7) \]

Notice that by applying the same approach, equation (2) gives \( (\Lambda / \Lambda) = (\lambda_n / \lambda_n) - (\lambda_s / \lambda_s) \). One would get the following equation by inserting equations (2), (3) and (4) into this

\[ \frac{\dot{\Lambda}}{\Lambda} = \frac{\dot{\alpha} k}{k} + \gamma \frac{h}{1 - \alpha} h = \frac{\gamma}{1 - \alpha} h \left[ B(1 - u) - \delta_s \right] \quad (7) \]

\[ \frac{\dot{\Lambda}}{\Lambda} = \frac{\dot{\phi}}{\phi} \frac{k}{h} - B(1 - u) + \delta_s (\rho - n) + \frac{\dot{\phi}}{\phi} (\delta_s + n) - (\rho - n) \]

\[ \frac{\dot{\phi}}{\phi} = \frac{\partial h}{\partial \phi} B h - B(1 - u) + \delta_s + \frac{\partial h}{\partial \phi} (\delta_s + n) \]

\[ \frac{\dot{\phi}}{\phi} = \frac{\partial h}{\partial \phi} (\delta_s + n) - \frac{1 - \alpha + \gamma}{1 - \alpha} B u - B(1 - u) + \delta_s \]

\[ \frac{\dot{\phi}}{\phi} = \frac{\partial h}{\partial \phi} \delta_s - n - \frac{1 - \alpha + \gamma}{1 - \alpha} B u - B + \delta_s \]

\[ \frac{\dot{\phi}}{\phi} = \frac{1}{\sigma} \left[ \frac{1 - \alpha + \gamma}{1 - \alpha} (B - \delta_s) - (\rho - n) \right] \] (11)

\[ \frac{\dot{g}_s}{\gamma} = \frac{1}{\sigma} \left[ \frac{1 - \alpha + \gamma}{1 - \alpha} (B - \delta_s) - (\rho - n) \right] \] (12)

Note that the parameters \( A \) and \( \delta_s \) from the goods productions have no effect on the output growth while the growth rate \( \hat{g}_s \) is increasing in the productivity contribution from the average number of brands in the economy, \( \gamma \); and the net productivity, \( B - \delta_s \), in this sector.

**Hypothesis**: Average branding increases the output growth.

In order to evaluate the effect of average number of brands, that is, external effect, on per capita growth rate, one would take the derivative with respect to productivity externality from average human capital in the economy, that is, \( \gamma \)

\[ \frac{\hat{g}_s}{\gamma} = \frac{1}{\sigma} \left( B - \delta_s \right) \]

implying that, with positive net productivity, per capita output growth is an increasing function of the average number of brands in the economy. Intuitively, devoting more time to brand creation decreases the time that is left for producing output, indicating a negative impact on the goods production. However, that allocation augments brand development more intensively, which raises the average number of brands in the economy, translating into a positive indirect effect on the output. In other words, effectiveness in branding influences the output growth by positively affecting the average number of brands in the economy in the form of a positive externality. It is important to keep in mind that branding, patent laws, and trademarking emerged as a shift from simple products to quality products in an attempt of firms to differentiate their production from the production of competitors. As a result,
this article argues that high-quality differentiated products that are produced by well-educated, creative know-how (i.e., valuable and effective brands) contribute to overall economic growth.

Quantitative Analysis

This section presents the quantitative analysis regarding the relationship between brand and economic growth. As stated in the theoretical model, branding is the “growth engine” of the economy, which is used as a form of human capital. Hence, the aim of this section is twofold. First, we want to discuss the strength of our assumption on the approximation of brand as human capital. Second, it attempts to explore the effect of branding on gross domestic product (GDP) per capita quantitatively in an attempt to support our theoretical results.

Since the World Bank data on HCI indicate the level of the knowledge, skills, and health that people accumulate throughout their lives, enabling them to realize their potential as productive members of the countries, we first check the correlation between the number of brands and HCI. The data on the world’s 500 most valuable brands across all sectors and countries are retrieved from the Brand Finance Global 500 report for 2017. HCI is gathered from the World Bank data and is only available for 2016 and 2018. It is an index ranging between 0 and 1, where a value of 0.5 shows that a child born today in that country will be half as productive as a future worker compared to its complete education and full health version. In 2018, the world average for HCI is 0.57, while it is close to 0.80 and 0.30 in developed and emerging markets, respectively. Finally, the annual data on the number of researchers in R&D per million people, GDP per capita and government expenditure per student for secondary education percentage of GDP per capita are also obtained from the World Bank covering years 2012 to 2018.

A simple comparison of HCI for developed and emerging markets gives rise to the argument that the emerging markets should invest in people through nutrition, health care, quality education, jobs, and skills to recover from poverty and to achieve the development level that the high-income countries have. As the theoretical model suggests, investing in people, in return, creates brands over the years, leading to a higher growth through the development process. Hence, for the legitimacy of our assumption, we check the correlation between HCI and brand for 18 countries. According to the left panel of Figure 1, as the trend line indicates, there is a positive relation between the number of 18 countries’ brands in the top 500 list and their HCI for 2018.

When we assume the United States as an outlier, due to the extensive number of United States brands on the list and repeat the same analysis, the positive correlation between HCI and brand gets stronger by 52% as in the right panel of Figure 1. A closer correlation coefficient value to 1 after the omission of the United States indicates that the USA can be considered as an influential point.

Benhabib and Spiegel (1994) argue that an approach in measuring human capital may be the average years of schooling of the labor force since the educated labor force is believed to be better in creating, implementing, and adopting new technologies. Given this insight, we use the number of researchers per million instead of HCI for a robustness check. Figure 2 illustrates the positive correlation of 0.55 between the number of researchers per million in countries with the number of brands.
With the following graph, we attempt to visualize how powerful the number of researchers per million and government expenditure per student affect brand development through time. We correlate the number of researchers per million and government expenditure per student in previous years with brands in 2017. Acknowledging that the human capital investments’ resulting in the development of valuable brands requires time, the purpose of this analysis is to gauge the time needed for this investment to turn into the strongest impact on the number of brands created. In Figure 3, the correlation of the interest variables with brands is on the vertical axis; and there is time on the horizontal axis. The correlation shows that there is a positive relation between investing in researchers (i.e., rise in the number of researchers per million) and in education with brand development. While government spending has an increasing positive effect on having valuable brands with an immediate relation, the number of researchers loses the strength of its impact on brands through time, although there is an immediate relation between the two. Thus, our findings support that to observe the strongest impact of government spending per student on brand development, approximately 3 years need to pass.

The analysis with respect to the relationship between branding and economic growth requires rigorous consideration because of the nature of their relationship. The findings of our previous study (Ökten et al., 2019) suggest that the relationship between branding and economic activity is time horizon dependent. Specifically, the results of the panel data analysis argue that the effect of brands on gross national product (GNP) is positive in the long run. The same analysis, however, finds that branding negatively affects GNP in the short run. The negative relationship in the short run can be attributed to the allocation of limited resources. Since creating brands takes time, GNP is affected negatively in the short run, namely throughout the birth period of the brand. As suggested in the theoretical model, allocating more time to brand development decreases the time left for producing output, indicating a negative effect on the production of goods. On the contrary, this allocation of time to brand creation augments human capital more intensively, which can be considered as providing a road map for the late-comers to the industry, learning-by-doing, know-how, getting more skillful in the development and design processes of a brand, and so on. As a result of this process, the average human capital in the economy (i.e., average number of brands of that country) rises, which translates into a positive indirect effect on the output. This intuition refers to the positive relation between brands and GNP that we detected in the long run in our previous study; and supports the general perception that the return on investment from education, human capital, and R&D take a long period of time. Brand development is also such an investment, and it takes time to observe its positive impact on GNP.

Since we have established the time-dependent relation of brand development to economic growth using a panel data regression analysis in an earlier study, we aim to provide further evidence to our current hypothesis in this article. Hence, we illustrate the degree to which branding and economic activity move in relation to one another. Top panel of Figure 4 demonstrates the parallel movements in brands and GDP per capita for the whole list of countries while the bottom panel repeats the same exercise by categorizing the countries as developed and emerging markets.

In all cases, there is a positive co-movement in brands and GDP per capita. While the whole sample correlation is 0.16, its developed and emerging market economy counterparts are 0.07 and 0.24, respectively. A higher correlation between brands and GDP per capita in emerging markets, compared to the developed countries, is the actualization of the convergence in development economics. It is important to stress that there are only eight emerging markets in the analysis where each has one brand, except China, which leads to the idea that commitment to the improvement of this relation between brands and GDP per capita in emerging markets is vital for the growth of these countries.

**Conclusion**

An endogenous growth model in a continuous time with branding used as an intangible capital input for goods production is constructed to study the long-run impact of brand development on economic growth. In the theoretical model, branding emerges as the “growth engine” of the economy because of its positive externality. More specifically, productivity contribution from the average number of brands in the economy boosts the per capita output growth.

In an attempt to verify the hypothesis brought by the theoretical model, a quantitative analysis is utilized. First, the approximation of branding as human capital is justified. To verify this, the strength of the linear relationship between investment in students and in researchers (which are considered HCI), is checked against branding. It indicates a stronger positive co-movement as time passes. Then, the effect of valuable brand development on GDP per capita is analyzed.
Asfuroglu et al. highlight the strength of the relationship. The positive correlation on this relation is demonstrated in all categorizations in terms of countries. By comparing the correlation between the number of brands in the top 500 list and GDP per capita of emerging markets and that of developed countries, this article concludes that there is a positive, yet, poor relation between these variables in emerging markets. These findings can be interpreted as follows: There is more room for improvement for human capital and related investment in emerging markets. Hence, this study exerts the importance of the way human capital is managed results in a greater development level and growth for the emerging markets.

The main contribution of this article is in terms of a policy recommendation for developing countries and emerging markets. While China, as an emerging markets economy, was in this list with 13 brands in 2008, it raised this number to 57 in 2017. Throughout this period, China has increased its investment in branding and technology, encapsulated as human capital investment, owing to its new growth strategy. As a result of this strategy, China has achieved not only a great economic growth rate but also accelerated its development. As Anholt suggests, the developing countries would benefit from powerful branding strategies, which could help them utilize the intangible assets in a productive and harmonized way. Similarly, this study proposes that emerging markets should shift from a traditional mass production to a production with high value added, like creating brands, by investing in their human capital in an attempt to increase their economic performance, which, in return, will help them catch up with the developed countries.

Figure 4. Scatter plot of GDP per capita and the number of brands in top 500 list with trend line.

Note. GDP = gross domestic product.
Appendix

Table A1. List of Countries for Variables.

| Country          | Variable                  |
|------------------|---------------------------|
| Australia        | a                        |
| Brazil           | d,e                       |
| Canada           | a,b                       |
| Chile            | c,d                       |
| China            | a,b                       |
| Colombia         | a,b                       |
| Denmark          | e,d                       |
| France           | a,b                       |
| Germany          | d                        |
| Hungary          | b                        |
| Ireland          | e                        |
| Indonesia        | a,b                       |
| Italy            | b                        |
| Japan            | a,b                       |
| Republic of Korea| a,b                       |
| Malaysia         | e                        |
| Netherlands      | d                        |
| South Africa     | a,b                       |
| Spain            | a,b                       |
| Saudi Arabia     | d                        |
| Sweden           | e                        |
| Switzerland      | a,b,d                     |
| Thailand         | e                        |
| Turkey           | a,b                       |
| United Kingdom   | e,d                       |
| United States    | a                        |

*Human Capital Index versus brand; b Researcher versus brand; c Government spending versus brand; d Developed countries; e Emerging Markets. Countries are categorized depending on in which figures their data are used.

Author Note

The author Nuriye Zeynep Ökten is now affiliated to Nişantaşı University, Istanbul, Turkey.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Dila Asfuroglu https://orcid.org/0000-0003-1650-6711

Notes

1. See, World Bank Group (2005). Another study by Roth and Thum (2010) find that intangible capital produces 59% of wealth in developing countries and 80% of wealth in developed countries.
2. Such as Alexander (2006) and Cabrita and Vaz (2005).
3. Among many others, see, Van Rooijen-Horsten et al. (2008), Edquist (2009), and Nakamura (2010).
4. There are nine emerging markets in the list, yet, the other data that we use require the inclusion of eight of them.
5. Remember that the average schooling of labor force is used as an ordinary input in the production function by Mankiw et al. (1992). Here, the number of brands refers to the number of educated people as the former depends on the latter.
6. Positive growth rate of output at the steady state requires the following inequality \((1 - \alpha + \gamma)(1 - \alpha)(B - \delta_L) > (\rho - n)\) which can be shown to hold as the interior solution to the problem at the steady state must satisfy \(0 < \mu^* < 1\).
7. See, appendix for the table of country list.
8. The large effect of the United States on the analysis is expected since the data sample is small.
9. The analysis cannot be repeated for government expenditure as the data for 2016 onwards are not available.
10. The lack and uncertainty of immediate payoff of R&D investments on current- or short-term results is suggested by Erickson and Jacobson (1992). Furthermore, they even mention the possibility of negative reactions to R&D.
11. Akroush and Al-Mohammad (2010) also emphasized the difficulty in determining the contribution of investments in marketing assets as the financial rewards can be realized in the long run.
12. A similar conclusion is drawn by Ruiz et al. (2017) indicating that the economic growth is possible through developing strong and valuable brands in emerging countries with developmental issues.

References

Akroush, M. N., & Al-Mohammad, S. M. (2010). The effect of marketing knowledge management on organizational performance: An empirical investigation of the telecommunications organizations in Jordan. International Journal of Emerging Markets, 5(1), 38–77.
Alexander, S. (2006, June 29–30). An intellectual capital audit of the Grand Duchy of Luxembourg [Paper presentation]. World Conference on Intellectual Capital for Communities, World Bank Office, Paris, France.
Anholt, S. (2005). Anholt Nation Brands Index: How does the world see America? Journal of Advertising Research, 45(3), 296–304.
Benhabib, J., & Spiegel, M. M. (1994). The role of human capital in economic development evidence from aggregate cross-country data. Journal of Monetary Economics, 34, 143–173.
Cabrita, M. d. R., & Vaz, J. L. (2005). Intellectual capital and value creation: Evidence from the Portuguese banking industry. Electronic Journal of Knowledge Management, 4(1), 11–20.
Edquist, H. (2009). How much does Sweden invest in intangible assets? (IFN Working Paper No. 785). Research Institute of Industrial Economics.
Erickson, G., & Jacobson, R. (1992). Gaining comparative advantage through discretionary expenditures: The returns to R&D and advertising. Management Science, 38(9), 1264–1279.
European Commission. (2010). EUROPE 2020: A European strategy for smart, sustainable and inclusive growth. https://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20EN%20version.pdf
Firer, S., & Williams, S. M. (2003). Intellectual capital and traditional measures of corporate performance. Journal of Intellectual Capital, 4(3), 348–360.
Lucas, R. E. (1988). On the mechanics of economic development. Journal of Monetary Economics, 22, 3–42.
Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. The Quarterly Journal of Economics, 107(2), 407–437.
Nakamura, L. I. (2010). Intangible assets and national income accounting. *Review of Income and Wealth, 56*, S135–S155.
Ökten, N. Z., Okan, E. Y., Arslan, Ü., & Güngör, M. Ö. (2019). The effect of brand value on economic growth: A multinational analysis. *European Research on Management and Business Economics, 25*(1), 1–7.
Organization for Economic Co-Operation and Development. (2011). *New sources of growth: Intangible assets.* http://www.oecd.org/sti/inno/46349020.pdf
Roth, F., & Thum, A. E. (2010). *Does intangible capital affect economic growth?* (CEPS Working Documents No. 335). Centre for European Policy Studies.
Ruiz, S., Arvate, P., & Xavier, W. (2017). Superior economic performance in developed and developing countries. *International Journal of Emerging Markets, 12*(1), 93–107.
Van Rooijen-Horsten, M., van den Bergen, D., de Haan, M., Klinkers, A., & Tanriseven, M. (2008, August 24–30). Intangible capital in the Netherlands: Measurement and contribution to economic growth [Paper presentation]. 30th General Conference of the International Association for Research in Income and Wealth, Portoroz, Slovenia.
World Bank Group. (2005). *Where is the wealth of nations? Measuring capital for the 21st century.* http://documents.worldbank.org/curated/en/287171468323724180/Where-is-the-wealth-of-nations-measuring-capital-for-the-21st-century