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THE LONG-RUN RELATIONSHIP BETWEEN HUMAN CAPITAL AND CURRENT ACCOUNT BALANCES

BEŞERİ SERMAYE VE CARİ İŞLEMLER DENGESİ UZUN DÖNEMLİ İLİŞKİSİ

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Abstract

This study aims to find out the long-run relationship between human capital and the current account balances. The panel data analysis is carried out for the time period between 1990 and 2018. 88 developing and developed countries are included in the study. Panel cointegration analysis is applied to test the long-run relationships. The human capital is represented by two indexes. First one is The Institute for Health Metrics and Evaluation (IHME) human capital index. Second one is United Nations human development index. For both indexes, there are significant and positive long-run relationships between the human capital indexes and current account balances for high income countries. It is determined that there is a negative, significant and long-term relationship for "all countries except industrialized countries", "all countries except Africa and industrialized countries" and "all countries" groups.

Keywords: Current account balances; human capital; panel data analysis; panel cointegration analysis.

Öz

Bu çalışmada beşeri sermaye ile cari işlemler dengesi arasında uzun dönemli ilişkinin varlığı araştırılmıştır. Panel veri analizi 88 gelişmiş ve gelişmekte olan ülke için 1990 ve 2018 yılları için uygulanmıştır. Uzun dönemli ilişkiyi araştırmak için panel eşbütünleşme analizi kullanılmıştır. Beşeri sermaye iki ayrı indeksle temsil edilmiştir. Birincisi Sağlık Ölçüm ve Değerlendirme Enstitüsü'nün beşeri sermaye indeksidir. İkincisi, Birleşmiş Milletler'in insani gelişim indeksidir. İki indeks için de, yüksek gelirli ülkeler grubunda beşeri sermaye ile cari işlemler dengesi arasında pozitif, anlamlı ve uzun dönemli bir ilişki olduğu sonucuna ulaşılmıştır. Sanayileşmiş ülkeler hariç tüm ülkeler, Afrika ve sanayileşmiş ülkeler hariç tüm ülkeler ve tüm ülkeler grubu için ise negatif, anlamlı ve uzun dönemli bir ilişkinin olduğu tespit edilmiştir.

Anahtar Kelimeler: Cari işlemler dengesi; beşeri sermaye; panel veri analizi; panel eşbütünleşme analizi.

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1. INTRODUCTION

Global current account balances have exceeded 5% of the world GDP in 2008 from 2% in 1996. In 2018, it was still close to 3% of the world GDP (Fig.1). When viewed globally, the USA's current account deficit was less than 2% of GDP in 1997. It increased to 5.8% of GDP in 2006. After the financial crisis it decreased to 2.3% of GDP in 2009 and it is still 2.6% in 2019. The USA has current account deficits since 1992. China has current account surpluses for 25 years since 1994. High-income, industrial countries like New Zealand, Canada, and Australia are running current account deficits for many years. In Europe, some other high-income countries like the UK, Greece, Portugal, Italy, and France had current account deficits during this period. Italy and Portugal, after they had deficits for years and they have just started to run surpluses since 2013. Germany has run high current account surpluses since 2002. In Far East Asia, Japan (since 1981), South Korea, Malaysia, and Singapore (since 1998) have significant current account surpluses. In Latin America, Brazil is running current account deficits since 2008. Mexico has run deficits since 1988.

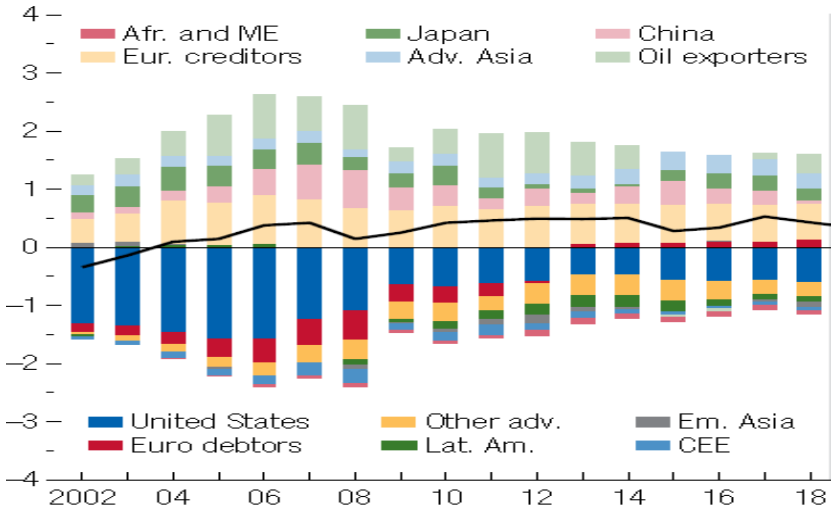
According to the stages of development hypothesis, all the developed countries would run current account surpluses. And all the developing countries would run current account deficits. But today a lot of developed countries are runnings deficits and also some of the developing countries are running surpluses. One of the explanations for the current account deficits of developed countries, especially for the USA is Bernanke's (2005) saving glut hypothesis. It argues that the global imbalances in the 2000s happened because of the capital flows from the developing countries towards the countries (like the USA) which have more efficient institutions and more developed financial systems. These developing countries have inefficient institutions and under-developed financial markets. In this paper, it will be investigated how human capital effects the current account balances. If countries that run current account surpluses get benefit from their high-level human capital. Or, if the flow of financial capital effected from the level of countries' human capital and increase their current account deficits. Debelle and Faruque (1996), Freund (2000), Calderon et al. (2002), Chinn and Prasad (2003), Gruber and Kamin (2005), Aristovnik (2006), Chinn and Ito (2007), Legg et al. (2007), Gruber and Kamin (2009), Cheung et al. (2013), Chinn et al. (2014), Das (2016), Altayligil and Çetrez (2020) are some of the studies related with the determinants of current account balances. The latest studies are especially concentrated on the institutional and financial determinants of current account balances.

This study contributes and extends the previous empirical studies by investigating the effect of human capital on current account balances for the first time in the literature. This study aims to find out the long-run relationship between human capital and the current account balances by using panel cointegration analysis. The human capital is represented by two indexes. First one is Institute for Health Metrics (IHME) human capital index. Second one is United Nations' human development index. For both indexes, human capital is found to have a positive and statistically significant long-run relationship with current account balances for high income countries. And there are negative long-run statistically significant relationships for all countries, all countries except industrial countries and all countries except industrial and African countries groups.

2. INSTITUTIONAL AND FINANCIAL FACTORS BEHIND GLOBAL CURRENT ACCOUNT BALANCES

It is important to understand the role of institutional and financial determinants in current account balances, and how they affect the current account balances. This may help easier to understand the possible role of the human capital. Some of the developing countries invested their excess capital to the countries with more developed financial markets. These

developing countries have inefficient and under-developed financial markets (Ju and Wei, 2006). Cheung et al. (2013) find financial development as one of the determinants only for all countries group. Altayligil and Çetrez (2020) find financial development as a determinant for all the country groups with negative signs. Financial market development is measured by the share of private credit to GDP in these studies.



Note: IMF World Economic Outlook Report 2019 October

Figure 1. Global Current Account Balance (Percent of world GDP)

According to the standard neoclassical theory, since they are expected to import capital from developed economies, developing countries with low capital-labor ratios should run current account deficits. According to the stages of development hypothesis, developing countries only when they become a more developed economy, they are expected to run current account surpluses. Before that they are expected to run deficits. Before the global financial crisis, opposite capital flows are seen which is explained by Lucas paradox (1990). Lucas paradox says capital flows to the developing countries have been lower than expected by the neoclassical theory. This can be related with the level of the financial development or the quality of the institutions which may lower risk-adjusted return to capital in developing countries (Alfaro et al., 2008).

Altayligil and Çetrez (2020) find out four different institutional determinants of current account balances, which are voice and accountability, legal system and property rights, political stability and absence of violence, political risks for full sample except industrial and African countries groups. Cheung et al. (2013) find out only regularity quality as determinant of current account balances with a negative sign for the full sample. Gruber and Kamin (2005) find out regulatory quality and rule of law as determinants for the full sample. Chinn and Ito (2007) find out determinant as legal variable for some of the country groups. It is a composite index created from law and order, corruption and bureaucracy quality. Improved institutional quality and financial development will encourage capital inflows which will cause higher current account deficits. The question is, when the level of human capital of the countries increases, capital inflows and current account deficits will also increase as well or not. And if there is a significant relationship with human capital and current account balances.

3. HUMAN CAPITAL AND ECONOMIC GROWTH

There are several studies in the literature which show human capital is one of the most important factors of economic growth (Lucas, 1988; Mankiw et al., 1992; Dela Fuente and Domenech, 2000). These studies are both related with the effect of level (so-called level effect) by its effect through labor productivity (Romer, 1990), and the rate effect by its increased competitive advantage through innovation and diffusion technology (Horwitz, 2005).

Labor productivity is regarded as an exogenous factor in the classical theory for economic growth. It depends on the ratio between workforce and physical capital and other factors. The effect of the education is not considered as a factor for potential growth of productivity. The new theory of economic growth includes the importance of human capital such as education and innovation in long-term economic growth. Several studies in the literature support that new growth theory. Self and Grabowski (2004) find that primary education has a strong effect on economic growth for India. Pereira and St. Aubyn (2009) show for Portugal that increasing the education at all school levels except tertiary has a positive and significant effect on growth. Blundell et al. (1999) find out that the growth rate of output depends on the rate human capital and innovation. Siddiqui and Rehman (2017) find that there are relationships between primary and secondary educations with economic growth in East Asia. Tertiary and vocational education have positive relationships with economic growth in South Asia. Government spending on education also effect economic growth positively in both regions.

Altayligil and Çetrez (2020) find that there is a positive relationship between growth rate and current account balances for the industrial countries. They explain that production for export supports the growth rate for the industrial countries. It is known that industrial countries export large portion of high technology goods which requires high level of human capital. So, when human capital increases, growth and export rates will increase, trade balance will improve, and eventually current account surpluses will increase. So, question is, if high level of human capital increases current account surpluses for high income countries in long term or not. Since human capital is one of the key factors of the economic growth. This will be checked especially for high-income countries.

4. HUMAN CAPITAL AND FDI INFLOWS

FDI inflows to the developing countries started since early 1980s. The speed of inflows increased during 1990s. FDI became one the most important source of funding for the developing countries (Noorbakhsh et al., 2001). Between 2002 and 2012 total FDI inflows to the developing countries increased by 323.4%. Higher portion of this increase tends to go to Asia and South America. (Cleeve et. al, 2015). Dunning (1977, 1988), Lucas (1990) and Zhang and Markusen (1999) explain human capital in the form of education is one the important determinants of FDI inflows. Skilled and qualified human capital is determined one of the factors that determine the inflow of FDI into countries (Kar, 2013; Lewin et al., 2009; Ndeffo, 2010; Suliman and Mollick, 2009). Kheng et al. (2017) investigate the relationship between human capital and FDI for 55 developing countries between 1980 and 2011. They find bi-directional causality between human capital and foreign direct investments.

According to the world investment report 2020 of Unctad, FDI flows to developed economies increased by 5%, to $800 billion, from $761 billion in 2018. FDI flows to developing countries decreased by 2% to $685 billion**.** Global FDI inflows became US$1.54 trillion in 2019, which is higher than $1.496 trillion in 2018. The United States is the largest receiver of foreign direct investments, attracting $246 billion in inflows. China is the second

country with FDI flows of $141 billion and Singapore is the third country with $92 billion FDI inflows. FDI inflows to Europe increased by 18% to $429 billion. In 2019, FDI flows to Africa decreased by 10% to $45 billion. In 2019, FDI flows into developing Asia decreased by 5% to $474 billion. FDI inflows to Latin America and the Caribbean increased by 10% to $164 billion.

FDI inflows top 20 host economies are: The USA, China, Singapore, Netherlands, Ireland, Brazil, Hong Kong, United Kingdom, India, Canada, Germany, Australia, France, Mexico, Russia, Italy, S. Cyprus, Indonesia, Sweden, Israel. FDI outflows top 20 home economies for 2019 are: Japan, The USA, Netherlands, China, Germany, Canada, Hong Kong, France, S.Korea, Singapore, United Kingdom, Italy, Spain, Sweden, Russia, Belgium, Ireland, Denmark, United Arab Emirates, Brazil. 13 countries, The USA, China, Singapore, Netherlands, Ireland, Brazil, Hong Kong, United Kingdom, Canada, Germany, France, Russia, Italy are in both lists.

For the current account balances net inflows are more important. For example, net inflows for USA are 1.64% of its GDP and for China it is 1.08% of its GDP. When we check (table 1), from world bank database, net flows divided by GDP first 20 countries change completely. China and the USA are not in the list. Only a few high-income countries can be seen in the list. So, FDI inflows may have less effect on the current account balances of the high-income countries. The question is, with increasing level of human capital and FDI inflows, if the current account deficits will increase as well or not. Negative relationship may be expected especially for the developing countries.

Table 1. Top 20 countries FDI Net Inflows (% of GDP) (World Bank, 2019)

#	Country Name (2019)	Net inflows (% GDP)
1	South Cyprus	97,05
2	Guyana	40,02
3	Congo, Rep.	31,10
4	Malta	30,27
5	Singapore	28,34
6	Hungary	19,91
7	Mongolia	17,63
8	Maldives	15,55
9	Mozambique	14,60
10	Hong Kong SAR, China	14,52
11	Seychelles	13,87
12	St. Vincent and the Grenad.	13,69
13	Cambodia	13,52
14	Macao SAR, China	11,49
15	Grenada	10,66
16	Estonia	9,43
17	Sierra Leone	9,32
18	Gabon	9,32
19	Panama	9,08
20	St. Kitts and Nevis	8,77

5. HUMAN CAPITAL INDEX

Human capital is explained as the level of health and education in a population (Lim et al., 2018). It is about the combined levels of education, training, skills, and health in a population (Benhabib and Spiegel, 1994). It is important how to proxy the human capital. In some of the studies number of years schooling used as the proxy for the human capital. But only using the number of years schooling may have some disadvantages. The level of knowledge gained in one country will be different from the knowledge gained in another country. The positive impact of the education is more related with quality rather than quantity (Pelinescu, 2014). Hanushek and Schultz (2012) show a deviation 100 points in PISA test results may be the reason of a 2% growth rate of GDP per capita. Health is another important part of human capital which must be considered.

Institute for Health Metrics and Evaluation (IHME) human capital index has four dimensions that are educational attainment, learning, functional health and survival. It is created based on the analysis of the available data for 195 countries for the period between 1990 and 2016. IHME human capital index checks the quality of the education based on standardized tests of mathematics, reading, and science by 5-year age groups for school aged children (Lim et al., 2018).

United Nation's human development index (HDI) is calculated based on the average achievement in three key dimensions of human development and sub-indexes. First one is life expectancy index, second one is education index, and the third one is GNI index. The scores for the three HDI sub-indexes are then used to create a new composite index by using geometric mean. HDI data is available between 1990 and 2018. In this study, both IHME human capital index and the human development indexes are used to find out the long-run relationship between human capital and current account balances.

6. DATA AND METHODOLOGY

This study aims to find out the long-run relationship between human capital and the current account balances by using panel data analysis method. The analysis is carried out for the period between 1990 and 2018 for 88 developing and developed countries. 41 developed and 47 developing countries are included in the study.

6.1 Data and model

High-income and developing countries are selected based on World Bank country classification. Full sample is the combination of high income and developing countries. Although industrial countries are in high-income countries group, they can be accepted as a smaller more developed country group. Removing industrial and African countries from full sample may create a more homogenous country group. So, five different country groups (appendix table 1) are analyzed, separately. Panel cointegration analysis is applied to examine the long-run relationships. Current account balances data are collected from the World Bank. The human capital is represented by two indexes. First one is Institute for Health Metrics (IHME) human capital index. Second one is United Nations human development Index (table 2). To identify the role of the human capital in current account balances, they are regressed on to two human capital indexes separately. Where CAB is the current account balances, HC is a vector of the human capital variables.

$$CAB_{it} = \alpha_{it} + \beta HC_{it} + u_{it} \quad (1)$$

Table 2. Sources of the Data

	Variables	Observation Numbers	Data Source
	Dependent Variable		
1	Current Account/GDP (%)	2403	World Bank
	Human Capital Determinants		
2	The Human Development Index (HDI)	2496	United Nations
3	IHME Human Capital Index	2376	IHME

6.2 Econometric Methodology

Panel cointegration analysis is used to find out the long-run relationship between human capital and the current account balances. The model comprises annual data. The panel data set is unbalanced. These steps are followed in the study. Pesaran test (2004) is used to check the cross-sectional dependency among all the variables. First generation unit root tests are not applied when there is cross-sectional dependency among the variables. On the other hand, it is seen there is always cross-sectional dependency among them. Second generation root tests must be used when the cross-sectional dependency is observed. So, second generation Pesaran (2007) panel root test is used. Pesaran (2007) unit root test results show that variables are not stationary. Cointegration tests are performed when time series are nonstationary to be able to understand if they have a solid, long-run relationship. The first differences of some of the nonstationary time series are stationary. Nonstationary time series tend to wander. Cointegration analysis shows if they wander together which means that if there is a long-run relationship among the series.

So, it is decided to use panel cointegration analysis. The cointegration tests and estimation methods are selected according to the parameters' homogeneity and cross-sectional dependency. Therefore, cross sectional dependence and homogeneity must be tested first before panel cointegration and estimations. Pesaran (2004) cross sectional dependency and Swamy (1971) S homogeneity tests are used. Pesaran test results show that variables have cross sectional dependency.

Swamy (1971) test results show that parameters are not homogenous. Second generation panel cointegration tests are more reliable in the presence of cross-sectional dependence. Second generation panel cointegration tests are grouped as homogenous and heterogeneous estimators (Tatoğlu, 2017). It is decided to use Gengenbach, Urbain and Westerlund (Gengenbach et al., 2016) panel cointegration test since there is cross sectional dependency and parameters are not homogenous. If there is cross sectional dependency second generation estimators are used, because first generation estimators are deviated. Second generation estimators are grouped into two as homogenous and heterogenous estimators (Tatoğlu, 2017). Second generation Dynamic Ordinary Least Squares Mean Group (DOLSMG) estimator (Pedroni, 2001) is used to find out the long-run estimation of the cointegration model, because models are cross sectional dependent and heterogeneous.

DOLSMG estimator starts using model (Tatoğlu, 2017) ,

$$Y_{it} = \mu_i + \beta_i X_{it} + u_{it} \quad \text{i= 1,…, N} \quad \text{t=1,…,T} \tag{2}$$

From this regression, the group-mean panel DOLS estimator is constructed as,

$$\beta_{DOLSMG} = N^{-1}\left[\sum_{i=1}^{N}\left(\sum_{i=1}^{T}(Z_{it}Z_{it}')^{-1}\right](\sum_{i=1}^{T}(Z_{it}\tilde{Y}_{it})\right) \tag{3}$$

Where Z_{it} is the 2(K + 1)x1 vector of regressors. And $\tilde{Y}_{it} = Y_{it} - \tilde{Y}_i$. So DOLMSG estimator is calculated of the mean of DOLS estimators for each i unit.

$$\beta_{DOLSMG} = N^{-1} \sum_{i=1}^{N} \beta_{DOLS,i} \quad (4)$$

And t statistics become,

$$t_{\beta,DOLSMG} = N^{-1} \sum_{i=1}^{T} t_{\beta_{DOLS,i}} \quad (5)$$

7. RESULTS

Pesaran test (2004) is used to check the cross-sectional dependence among all the variables. First generation unit root tests are not applied when there is the cross-sectional dependency among the variables. On the other hand, it is seen there is always cross-sectional dependency among the variables (table 3).

Table 3. Pesaran Cross Sectional Dependence Test Results for Variables

	High Income	Developing	Full Sample-Industrial	Full Sample-Africa&Indu	Full Sample
	CD-test	CD-test	CD-test	CD-test	CD-test
CAB	(7.63)***	(7.57)***	(8.37)***	(11.44)***	(9.18)***
IHM	(143.3)***	(157.66)***	(224.36)***	(176.44)***	(298.17)**
HDI	(149.63)***	(156.42)***	(226.62)***	(176)***	(305.79)**

CD-test statistics in parenthesis. *, **, *** indicate significance level at 10%, 5%, 1%, respectively.

Second generation root tests must be used when the cross-sectional dependency is observed. Second generation Pesaran (2007) panel root test is used. Pesaran (2007) unit root test results show that, for high income, all countries except industrial, all countries groups' current account balance and both human capital indexes are not stationary. For all countries except African and industrial countries group current account balance and IHME human capital indexes are not stationary. Cointegration analysis will be carried out for these country groups. Also, first differences of all the variables are stationary all the time (table 4). Since for developing countries current account balances are stationary, they are not included in the cointegration analysis. HDI is stationary for full sample except Africa and industrial countries. It is not included in the cointegration analysis either.

Table 4. Pesaran Unit Root Test Results for Variables

	High Income	Developing	Full Sample-Industrial	Full Sample-Africa&Industr.	Full Sample
I(0)	Z[t-bar]	Z[t-bar]	Z[t-bar]	Z[t-bar]	Z[t-bar]
CAB	(1.755)	(-1.689)**	(0.350)	(1.056)	(3.289)
IHM	(-0.593)	(2.155)	(4.386)	(3.895)	(3.996)
HDI	(-0.659)	(0.543)	(0.738)	(-2.735)***	(-0.159)
I(1)	Z[t-bar]	Z[t-bar]	Z[t-bar]	Z[t-bar]	Z[t-bar]
CAB	(-13.036)***	(-14.461)***	(-18.445)***	(-16.308)***	(-19.623)***
IHM	(-1.281)*	(-3.704)***	(-4.733)***	(-4.173)***	(-3.008)***
HDI	(-9.740)***	(-8.373)***	(-10.102)***	(-9.665)***	(-11.799)***

t- statistics in parenthesis. *, **, *** indicate significance at 10%, 5%, 1%, respectively.

The cointegration tests and estimation methods are selected according to the parameters homogeneity and cross-sectional dependency. Therefore, cross sectional dependency and homogeneity must be tested first before panel cointegration and estimations. Pesaran (2004) cross sectional test results show that there is cross sectional dependency for both equations (table 5).

Table 5. Pesaran Cross Sectional Dependence Test Results for Cointegration Analysis

	High Income	Full Sample-Indus	Full Sample - Africa&Indus.	Full Sample
	CD-test	CD-test	CD-test	CD-test
CAB-	(5.35)**	(8.06)***	(7.58)***	(8.43)***
CAB-HDI	(5.32)**	(7.50)***		(6.88)***

CD-test statistics in parenthesis. *, **, *** indicate significance at 10%, 5%, 1%, respectively.

Swamy (1971) S homogeneity tests are used. Swamy S test results show that parameters are not homogenous for both equations (table 6).

Table 6. Swamy S Homogeneity Test Results

	High Income	Full Sample-Industrial	Full Sample - Africa&Indus.	Full
	Prob>chi	Prob>chi2	Prob>chi2	Prob>chi2
CAB-	0.0000	0.0000	0.0000	0.0000
CAB-HDI	0.0000	0.0000		0.0000

Second generation panel cointegration tests are grouped as homogenous and heterogeneous estimators. It is decided to use Gengenbach, Urbain and Westerlund Panel Cointegration (Gengenbach et al., 2016) since there is cross sectional dependency and parameters are not homogenous. The estimated cointegration test results can be seen in (table 7). All variables are significant at 1% level, and there is a cointegration relationship between human capital and current account balances for both indexes and four country groups.

Table 7. Gengenbach, Urbain and Westerlund Panel Cointegration Test Results

Panel EC-test (CAB-IHME, High Income):	d.y |	Coef	T-bar	P-val*
	y(t-1) |	-0.729	-3.099	<=0.01
Panel EC-test (CAB-HDI, High Income):	d.y |	Coef	T-bar	P-val*
	y(t-1) |	-0.612	-2.873	<=0.01
Panel EC-test (CAB-IHME, Full Sample except Indus.):	d.y |	Coef	T-bar	P-val*
	y(t-1) |	-0.704	-3.026	<=0.01
Panel EC-test (CAB-HDI, Full Sample except Indus.):	d.y |	Coef	T-bar	P-val*
	y(t-1) |	-0.636	-2.847	<=0.01
Panel EC-test (CAB-IHME, Full Samp. exp. Ind.&Afr.):	d.y |	Coef	T-bar	P-val*
	y(t-1) |	-0.676	-3.017	<=0.01
Panel EC-test (CAB-IHME, Full Sample):	d.y |	Coef	T-bar	P-val*
	y(t-1) |	-0.680	-2.911	<=0.01
Panel EC-test (CAB-HDI, Full Sample):	d.y |	Coef	T-bar	P-val*
	y(t-1) |	-0.570	-2.613	<=0.01

Dynamic Ordinary Least Squares Mean Group (DOLSMG) estimator (Pedroni, 2001) is used to find out the long-term estimation of the cointegration model. Beta is long-term parameter for the estimation between current account balances and R&D spending. Results show that all variables are significant 1% or 5%, and there are cointegration relationships

between current account balances and human capital indexes. For both indexes, human capital is found to have positive and statistically significant long-run relationships with current account balances for high income countries. And there are negative long-run statistically significant relationships for all countries, all countries except African countries and all countries except industrial and African countries groups (table 8).

Table 8. DOLSMG Estimation Results

	High Income	Full Industrial	Full Sample Africa&Indu	Full Sample
	Beta	Beta	Beta	Beta
CAB-IHME	(0.6141)***	(-1.96)***	(-0,6809)**	(-4.421)***
CAB-HDI	(23.51)**	(-7.64)***		(-40)***

*, **, *** indicate significance at 10%, 5%, 1%, respectively.

Developing countries have higher net capital flows divided by GDP. China and the USA which are having highest capital inflows are not in top 20 list. Only a few high-income countries can be seen in the list. Results support FDI inflows may have less effect on the current account balances of the high-income countries. There are 8 positive significant, 5 positive insignificant relationships especially for the industrial countries (Table 9). But for the developing countries when the level of human capital increases, more FDI inflows, and it increases the current account deficits. There are negative long-run statistically significant relationships for all countries, all countries except industrial countries and all countries except industrial and African countries groups. Global foreign direct investment (FDI) reached US$1.54 trillion in 2019. The depression in FDI flows to Africa in 2019, by 10% to $45 billion. Only 3% of FDI inflows are towards to Africa. African countries are less affected from FDI inflows. There are 4 negative insignificant, 5 positive insignificant, 2 positive significant relationships for African countries (table 9). High income countries values are from high income DOLSMG estimation results. Developing countries values are from all countries DOLSMG estimation results.

Table 9. DOLSMG Estimation Results for all Countries (IHME Index)

#	Developing	Beta	t-stat	High Income	Beta	t-stat
1	Turkey	(-1.187)***	-6.008	United Kingdom	(4.83)***	5.96
2	Jordan	(-7.39)**	-2.335	Austria	(40.12)***	21.23
3	Ukraine	(-10.54)**	-2.527	Belgium	(8.218)***	9.068
4	Peru	(-9.027)**	-2.272	Canada	(4.689)***	7.716
5	Morocco	(-9.248)***	-5.542	United States	(2.126)***	6.181
6	Gabon	(-3.401)**	-2.213	Croatia	(26.38)**	2.14
7	Pakistan	(-3.162)*	-1.684	Estonia	(5.577)*	1.953
8	Romania	(-6.786)*	-1.73	Finland	(17.15)***	13.05
9	Armenia	(-7.11)*	-1.801	France	(4.132)***	8.732
10	Nicaragua	(-29.46)***	-6.997	Hungary	(10.67)***	4.138
11	Algeria	(-102.5)***	-9.036	Italy	(4.066)***	3.692
12	Paraguay	(-2.786)*	-1.831	Singapore	(5.518)*	1.956
13	Tunisia	(-2.04)***	-3.994	Slovakia	(5.16)*	1.684
14	Uganda	(-2.718)*	-1.833	Latvia	(3.305)	1.232
15	Angola	(-2.557)	-.2403	New Zealand	(.8644)	.1376
16	Azerbaijan	(-16.08)	-1.552	Venezuela	(8.348)	.6951
17	Brazil	(-1.765)	-1.236	Australia	(1.131)	.5919
18	Bangladesh	(-.1824)	-.1156	Spain	(.1401)	.07957
19	Botswana	(-2.061)	-.9752	Norway	(2.027)	.2138
20	Egypt	(-.8397)	-.4957	Switzerland	(3.028)	.8257
21	Bulgaria	(-.7605)	-.08736	Luxembourg	(4.779)	.6211
22	Honduras	(-3.286)	-1.005	Slovenia	(1.325)	1.326
23	China	(-.418)	-.497	Uruguay	(2.944)	1.412
24	India	(-.6196)	-.4272	Denmark	(-7.925)***	-11.84

25	Fiji	(-6.557)	-1.146	Iceland	(-19.2)**	-2.37
26	Indonesia	(-.6721)	-.2309	Malta	(-11.98)***	-.3.871
27	Kyrgyz Republic	(-9.838)	-.9643	Poland	(-1.843)**	-2.125
28	Guatemala	(-2.11)	-.3641	Germany	(-20.01)***	-6.133
29	Congo Dem. Rep.	(-116.8)	-1.394	Russia	(-4.585)**	-3.159
30	Georgia	(-.8136)	-.1528	Ireland	(-34.57)***	-22.62
31	Malaysia	(6.295)***	3.584	Israel	(-4.087)***	-4.649
32	Macedonia	(6.335)*	1.751	S.Cyprus	(-6.281)**	-2.032
33	Madagascar	(4.847)***	3.175	Portugal	(-7.626)	-1.487
34	S. Africa	(1.18)***	4.285	S.Korea	(-.8012)	-.4301
35	Kazakhstan	(1.183)	1.104	Greece	(-3.007)	-1.215
35	Cameroon	(.08231	.07662	Lithuania	(-4.517)	-1.068
37	Mexico	(.2088)	.2726	Czech Republic	(-1.359)	-.881
38	Thailand	(3.757)	1.387	Holland	(-2.054)	-.825
39	Albania	(2.827)	.6281	Chile	(-2.644)	-.5679
40	Bolivia	(.1044)	.01117	Japan	(-7.806)	-1.636
41	Ghana	(.9858)	.9381	Sweden	(-1.056)	-1.024
42	Haiti	(1.325)	1.254			
43	Ethiopia	(1.123)	.3832			
44	Kenya	(.5431)	.1794			
45	Nepal	(2.106)	.5713			
46	Sudan	(1.693)	.3236			
47	Philippines	(1.064)	1.103			

*, **, *** indicate significance at 10%, 5%, 1%, respectively.

A lot of developing countries when they improve institutional quality, financial development and the level of human capital, capital inflows towards these countries may be expected to increase. The increase of capital inflows may also increase the current account deficits of those developing countries. As a result, foreign debts may increase as well. If especially foreign debts are not used in the productive areas, that may cause debt crises in the future. Also, high level of capital inflows may cause the appreciation of local currency which will bring disadvantage for the international trade. And it will also increase the current account deficits. So, these side effects must be considered in case of high capital inflows to the developing countries because of improved institutional quality, financial development, and human capital.

Altayligil and Çetrez (2020) find that there is positive relationship between growth rate and the current account balances for the industrial countries. They explain that production for export supports the growth rate for the industrial countries. Human capital is one of the key factors of the economic growth. We know that industrial countries export large portion of high technology goods which requires high level of human capital. So, when human capital increases, growth rate and export rates will improve, trade balance will improve, and current account balances will improve for high income countries. Results support, when the level of human capital is higher, current account surpluses get higher in long term for high income countries. There is a positive and statistically significant long-run relationships with current account balances for high income countries.

DOLSMG estimation results for all countries can be seen at (table 9). Most of the high-income countries have positive sign. Most of the developing countries have negative sign. High income countries like Poland, Iceland, Ireland, S. Cyprus, Israel, Portugal, and Russia are having significant FDI capitals inflows for years. Poland is having net FDI capital inflows from 1990 to 2019 with highest 6.22 % of its GDP in 2006. Iceland having net FDI inflows from 1996 to 2015 with 32% in 2007. Ireland is having net FDI inflows from 1970 to 2018 with highest 22.8% in 2009. S. Cyprus is having net FDI inflows from 1975 to 2019 with 280.13% in 2012. And finally, Portugal is having net FDI inflows between 1970 and 2019 with highest 9.89 % in 2012. Negative sign can be related to that high amount of net

FDI inflows for those high-income countries. Only Malaysia, Macedonia, Madagascar, S. Africa have significant positive relationships in developing countries which show human capital on growth rate and export is more dominant than FDI inflows effect.

8. CONCLUSIONS

The aim of the study is to find out the long-run relationship between human capital and the current account balances. The panel data analysis is carried for the period between 1990 and 2018. 88 developing and developed countries are included in the study. Panel cointegration is applied to find out the long-run relationships. The human capital is represented by two indexes. First one is Institute for Health Metrics (IHME) human capital index. Second one is United Nations human development Index. For both indexes, there are positive and statistically significant long-run relationship with current account balances and human capital for high income countries. And there are negative long-run statistically significant relationships for all countries, all countries except industrial countries and all countries except industrial and African countries groups.

Developing countries have higher net capital inflows divided by their GDPs. China and the USA which are having highest capital inflows, are not in top 20 list. Results support FDI inflows may have less effect on the current account balances of most of the high-income countries. Skilled and qualified human capital is determined one of the factors that determine the inflow of FDI into developing countries (Kar, 2013; Ndeffo, 2010; Suliman and Mollick, 2009). Kheng et al. (2017) investigate the relationship between human capital and FDI for 55 developing countries between 1980 and 2011. They find bi-directional causality between human capital and foreign direct investments. So, for most of the developing countries when the level of human capital increases, FDI inflows increase, and it increases the current account deficits. There are negative long-run statistically significant relationships for all countries, all countries except African countries and all countries except industrial and African countries groups.

Altayligil and Çetrez (2020) find that there is positive relationship between growth rate and current account balances for the industrial countries. They explain that production for export supports the growth rate for the industrial countries. Human capital is one of the key factors for the economic growth. We know that industrial countries export large portion of high technology goods which requires high level of human capital. Results support, when the level of human capital is higher, current account surpluses get higher in long term for high income countries. There is a positive and statistically significant long-run relationships with current account balances for high income countries.

REFERENCES

Alfaro, L., Ozcan, S. K. & Volosovych V. (2008). Why doesn't capital flow from rich to poor Countries? An empirical investigation. *The Review of Economics and Statistics,* 90 (2): 347–368.

Altayligil, Y.B. & Çetrez, M. (2020). Macroeconomic, institutional and financial determinants of current account balances: a panel data assessment. *The Journal of Economic Structures*, 9, 49.

Aristovnik, A. (2006). The determinants and excessiveness of current account deficits in Eastern Europe and the former Soviet Union. William Davidson Institute, 827.

Benhabib, J. & Spiegel M. M. (1994). The role of human capital in economic development evidence from aggregate cross-country data. *Journal of Monetary Economics*, Volume 34, Issue 2, Pages 143-173.

Bernanke, B. (2005), The global saving glut and the US current account deficit, Remarks by Governor Ben S. Bernanke, at the Homer Jones Lecture, St. Louis, Missouri.

Blundell R., Dearden L., Meghir C. & Sianeso B. (1999). Human capital investment: The returns from education and training to the individual, *The Firm and The Economy, Fiscal Studies*. vol. 20, no. 1, pp. 1-23.

Calderon, C., Chong, A. & Loayza N. (2002). Determination of current account deficits in developing countries. World Bank Policy Research Working Paper, No. 2398.

Cheung, C., Furceri D. & Rustecelli E. (2013). Structural and cyclical factors behind current account balances. *Review of International Economics*, 21: 923-944.

Chinn, M. & Prasad E. (2003). Medium-term determinants of current accounts in industrial and developing countries: an empirical exploration. *Journal of International Economics*, 59: 47–76.

Chinn M., Eichengreen B. & Ito H. (2014). A forensic analysis of global imbalances. *Oxford Economic Papers*, Volume 66, Issue 2, Pages 465–490.

Chinn, M. & Ito, H. (2007). Current account balances, financial development, and institutions: Assaying the world saving glut. *Journal of International Money and Finance*, Elsevier, vol. 26(4), p. 546-569.

Cleeve, E. A., Debrah Y. & Yiheyis, Z. (2015). Human capital and FDI inflow: An assessment of the African case. *World Development*, Volume 74, Pages 1-14.

Das, D. K. (2016). Determinants of current account imbalance in the global economy: a dynamic panel analysis. *The Journal of Economic Structures*, 5, 8.

Debelle, G. & Faruqee, H. (1996). What determines the current account?. IMF Research Department, WP/96/58.

De La Fuenta, A. & Domenech, R. (2006). Human capital in growth regressions: how much difference does data quality make?. *J. Eur. Econ. Assoc*. 4 (1), 1–36.

Dunning, J. H. (1977). Trade, location of economic activity and the MNE: a search for an eclectic approach, in Bertil Ohlin, Per-Ove Hesselborn and Per Magnus Wijkman, eds., *The International Allocation of Economic Activity*. London: Macmillan, 395-418.

Dunning, J. H. (1988). The eclectic paradigm of international production: a restatement and some possible extensions. *Journal of International Business Studies*, 19(1): 1-31.

Freund, C. L. (2000). Current account adjustment in industrialized countries. Board of Governors of the Federal Reserve System International Finance Discussion Papers, Number 692.

Gengenbach, C., Urbain, J. & Westerlund J. (2016). Error correction testing in panels with common stochastic trends. *Journal of Applied Econometrics*, 31: 982-1004.

Gruber, J. & Kamin S. (2005). Explaining the global pattern of current account imbalances. Board of Governors of the Federal Reserve System International Finance Discussion Papers, Number 846.

Gruber, J. & Kamin S. (2009). Do differences in financial development explain the global pattern of current account imbalances. *Review of International Economics*, vol. 17, No. 4, 667-688.

Hanushek, E. A. & Shultz, G.P. (2012). Education is the key to a healthy economy. *The Wall Street Journal*.

Horwitz, F. (2005). HR CAN Competitiveness advance. *Executive Business Brief*, 10, 50-52.

IMF World Economic Outlook (2019). Global manufacturing downturn, rising trade barriers. https://www.imf.org/en/Publications/WEO/Issues/2019/10/01/world-economic-outlook-october-2019 (Retrieved from.16.04.2021)

Ju, J. & Wei S-J. (2006). A solution to two paradoxes of international capital flows. NBER Working Paper, 12668.

Kheng, V., Sun, S. & Anwar, S. (2017). Foreign direct investment and human capital; a panel data approach. *Economic Change and Restructuring*, 50 (4), 341-365.

Kar, S. (2013). Exploring the causal link between FDI and human capital development in India. *Decision*, 40(1–2), 3–13.

Legg, A., Prasad N. & Robinson T. (2011). Global imbalances and the global saving glut: A panel data assessment. Economic Research Department Reserve Bank of Australia Research Discussion Paper, 2007-11.

Lewin, A. Y., Massini, S. & Peters, C. (2009). Why are companies off shoring innovation? The emerging global race for talent?, *Journal of International Business Studies*, 40, 901–925.

Lim, S. S., Updike, R. L., Kaldjian A. S, Barber R. M., Cowling K., York H., Friedman J., Xu R., Whisnant J. L., Taylor H. J., Leever A. T., Roman Y., Bryant M. F., Dieleman N J., Gakidou E. and Murray C. J. L. (2018). Measuring human capital: a systematic analysis of 195 countries and territories, 1990–2016. *The Lancet*, Volume 392, Issue 10154, Pages 1217-1234.

Lucas, R. E. (1988). On the mechanism of economic development. *Journal of Monetary Economics*, 22: 3- 22.

Mankiw, N., Romer, D., & Weil, D. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics*, 107, 407−437.

Ndeffo, N. (2010). Foreign direct investments and human capital development in Sub-Saharan Africa, Luc. Annals of "Dunarea de Jos" University of Galati: Fascicle 1. *Economics and Applied Informatics*, 16(2), 37–50.

Noorbakhsh F., Paloni A. & Youssef A. (2001). Human capital and FDI inflows to developing countries: New empirical evidence. *World Development*, Volume 29, Issue 9, 2001, Pages 1593-1610.

Pedroni, P. (2001). Purchasing power parity tests in cointegrated panels. *The Review of Economics and Statistics*, 83 (4), 727-731.

Pelinescu, E. (2015). The impact of human capital on economic growth. *Procedia Economics and Finance*, Volume 22, Pages 184-190.

Pereira, J. & Aubyn M. S. (2009). What level of education matters most for growth? Evidence from Portugal. *Economics of Education Review*, Volume 28, Issue 1, Pages 67-73.

Pesaran, M.H. (2004). General diagnostic tests for cross section dependence in panels. CESifo Working Paper, 1229: 1-40.

Pesaran, M.H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics*, 22(2): 265-312.

Romer, P. (1990). Human capital and growth: theory and evidence. Carnegie Rochester Conference Series on Public Policy, 32, pp.251-286.

Self, S. & Grabowski, R. (2004). Does education at all levels cause growth? India, a case study, *Economics of Education Review*, 23, 47−55.

Siddiqui A. & Rehman A. (2017). The human capital and economic growth nexus: in East and South Asia. *Applied Economics*, vol.49, issue 28, 2697-2710.

Suliman, A. H. & Mollick, A. V. (2009). Human capital development, war, and foreign direct investment in Sub-Saharan Africa. *Oxford Development Studies*, 37(1), 47–61.

Swamy P. (1971). Statistical inference in a Random coefficient regression model. *Econometrica* 38(2), 311-322.

Tatoğlu, F.Y. (2017). *Panel zaman serileri analizi*. Beta Basım Yayım Dağıtım.

United Nations Development Programme (2020). Human development report, human development index. http://hdr.undp.org/en/content/human-development-index-hdi (Accessed 16.11.2020).

UNCTAD World Investment Report (2020). International production beyond the pandemic (UNCTAD/WIR/2020).

Zhang, K. H. & Markusen J. R. (1999). Vertical multinationals and host-country characteristics. *Journal of Development Economics*, Volume 59, Issue 2.

APPENDIX

Appendix Table 1. Country Groups

Full Sample except Industrial Countries
Chile, Croatia, Czech Republic, Estonia, Hungary, Israel, S. Korea, Latvia, Lithuanian, Luxembourg, Poland, Russia, Singapore, Slovakia, Slovenia, Uruguay, Venezuela, S.Cyprus, Hong Kong, Malta, Albania, Algeria, Angola, Armenia, Azerbaijan, Bangladesh, Bolivia, Botswana, Brazil, Bulgaria, China, Cameroon, Congo Democratic Republic, Ethiopia Egypt, , Fiji, Gabon, Ghana, Georgia, Guatemala, Honduras, Haiti, India, Indonesia, Jordan, Kazakhstan, Kenya, Kırghızstan, Macedonia, Madagascar, Malaysia, Mexico, Morocco, Nepal, Nicaragua, Pakistan, Paraguay, Peru, Philippines, Romania, Republic of South Africa, Sudan, Thailand, Tunisia, Turkey, Uganda, Ukraine.
Full Sample except Industrial Countries
Chile, Croatia, Czech Republic, Estonia, Hungary, Israel, S. Korea, Latvia, Lithuanian, Luxembourg, Poland, Russia, Singapore, Slovakia, Slovenia, Uruguay, Venezuela, S.Cyprus, Hong Kong, Malta, Albania, Armenia, Azerbaijan, Bangladesh, Bolivia, Brazil, Bulgaria, China, Fiji, Georgia, Guatemala, Haiti, Honduras, India, Indonesia, Jordan, Kazakhstan, Kırghızstan, Macedonia, Malaysia, Mexico, Nepal, Nicaragua, Pakistan, Paraguay, Peru, Philippines, Romania, Thailand, Turkey, Ukraine.
Full Sample
Australia, Austria, Belgium, Canada, Chile, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, S. Korea, Latvia, Lithuanian, Luxembourg, Holland, N. Zealand, Norway, Poland, Portugal, Russia, Singapore, Slovakia, Slovenia, Spain, Swiss, Switzerland, United Kingdom, USA, Uruguay, Venezuela, S.Cyprus, Hong Kong, Malta, Albania, Algeria, Angola, Armenia, Azerbaijan, Bangladesh, Bolivia, Botswana, Brazil, Bulgaria, Cameroon, China, Democratic Republic of Congo, Egypt, Ethiopia, Fiji, Gabon, Georgia, Ghana, Guatemala, Haiti, Honduras, India, Indonesia, Jordan, Kazakhstan, Kenya, Kırghızstan, Macedonia, Madagascar, Malaysia, Mexico, Morocco, Nepal, Nicaragua, Pakistan, Paraguay, Peru, Philippines, Romania, Republic of South Africa, Sudan, Thailand, Tunisia, Turkey, Uganda, Ukraine.
Developing Countries
Albania, Algeria, Angola, Armenia, Azerbaijan, Bangladesh, Bolivia, Botswana, Brazil, Bulgaria, Cameroon, China, Democratic Republic of Congo, Egypt, Ethiopia, Fiji, Gabon, Georgia, Ghana, Guatemala, Haiti, Honduras, India, Indonesia, Jordan, Kazakhstan, Kenya, Kırghızstan, Macedonia, Madagascar, Malaysia, Mexico, Morocco, Nepal, Nicaragua, Pakistan, Paraguay, Peru, Philippines, Romania, Republic of South Africa, Sudan, Thailand, Tunisia, Turkey, Uganda, Ukraine.
High-income Countries
Australia, Austria, Belgium, Canada, Chile, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, South Korea, Latvia, Lithuanian, Luxembourg, Holland, New Zealand, Norway, Poland, Portugal, Russia, Singapore, Slovakia, Slovenia, Spain, Swiss, Switzerland, United Kingdom, United States of America, Uruguay, Venezuela, S.Cyprus, Hong Kong, Malta.