

Towards Sustainable Development: Revisiting the Middle-Income Trap Hypothesis for the Southern Common Market Countries

W kierunku zrównoważonego rozwoju: powrót
do hipotezy pułapki średniego dochodu
dla południowych krajów wspólnego rynku

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Abstract

One of the Sustainable Development Goals (SDGs) of the United Nations is to promote, sustained, inclusive, and sustainable economic growth. However, it is observed that many countries struggle to move up from the middle-income to high-income level, which refers to the middle-income trap (MIT). In this paper, we test the MIT hypothesis using a novel unit root test of Gómez-Zaldívar et al. (2013) across the Southern Common Market (MECOSUR) countries. To do so, we follow a different path from the existing literature and use a novel unit root testing strategy. We first test the significance of the trend term and then examine the unit root properties of the series by allowing multiple structural breaks according to the existence/non-existence of the trend term. Our results provide evidence of stationarity for Brazil, Colombia, Ecuador, and Peru, indicating that these four MERCOSUR countries are in MIT.

Key words: middle-income trap, sustainable development, MERCOSUR

Streszczenie

Jednym z Celów Zrównoważonego Rozwoju Organizacji Narodów Zjednoczonych jest promowanie trwałego, sprzyjającego włączeniu społecznemu i zrównoważonego. Wiele krajów ma jednak trudności z przejściem z poziomu średniego dochodu do poziomu wysokiego dochodu, co odnosi się do pułapki średniego dochodu (MIT). W tym artykule testujemy hipotezę MIT, za pomocą nowatorskiego testu pierwiastka jednostkowego Gómez-Zaldívar i in. (2013), w krajach Południowego Wspólnego Rynku (MERCOSUR). Podążamy inną ścieżką wskazaną w istniejącej literaturze, stosując nowatorską strategię testowania pierwiastka jednostkowego. Najpierw testujemy znaczenie terminu trendu, a następnie badamy właściwości pierwiastka jednostkowego szeregu, dopuszczając wiele przerw strukturalnych w zależności od istnienia/nieistnienia terminu trendu. Nasze wyniki dostarczają dowodów na stacjonarność dla Brazylii, Kolumbii, Ekwadoru i Peru, wskazując, że te cztery kraje MERCOSUR są w MIT.

Słowa kluczowe: pułapka średniego dochodu, zrównoważony rozwój, MERCOSUR

1. Introduction

The concept of sustainable development was defined in detail by the United Nations World Commission in its 1987 report entitled *Our Common Future*. In the report, sustainable development is defined as a development that meets the demands of the present without compromising future generations to meet their own needs (WCED, 1987). However, there are several definitions of the concept (Elliott, 2013). For example, according to Turner (1988), an optimal (sustainable growth) strategy would attempt to maintain an *acceptable* rate of increase in real per capita incomes without depleting the national capital asset stock or the natural environmental asset stock. There are many dimensions of sustainable development. Pawłowski (2008, 2011) argues that sustainable development has moral, ecological, social, economic, legal, technical, and political dimensions.

In 2015, the United Nations adopted the *2030 Agenda for Sustainable Development*, which includes 17 Sustainable Development Goals (SDGs) with 169 targets, to end poverty and hunger, protect the world from degradation, and maintain peace and prosperity. Regarding the economic dimension of sustainable development, one of the SDGs is to promote sustained, inclusive, and sustainable economic growth. However, it is observed that many countries fail to achieve sustainable growth because most of them struggle to move up from middle-income to high-income level which creates obstacles to sustainable long-term growth (Leven, 2019). The middle-income trap (MIT) refers to the barriers to sustainable growth encountered by some developing middle-income countries. It is obvious that some middle-income countries may not achieve sustained growth and not be able to move up to the high-income level. For example, in 1987, while Chile was a lower-middle-income country, Argentina was an upper-middle-income country according to the World Bank income classification. However, as of 2021, Argentina is still an upper-middle-income country, whereas Chile moved to high-income status in 2012. The term MIT was introduced by Gill and Kharas (2007), and since then, it has become one of the most controversial and discussed topics in economic growth literature. The MIT typically refers to countries that reach a middle-income level after experiencing a rapid growth period but have not been able to reach the high-income level (Glawe and Wagner, 2020). The MIT concept is also explained within the framework of comparative advantage. Middle-income countries have difficulty competing with both low-income countries that have a comparative advantage in labour-intensive sectors and rich countries with advanced technology and innovation-based growth, and they are caught in MIT (Gill and Kharas, 2007).

Although there are some mathematical models explaining (e.g., Agenor and Canuto, 2015; Dabús et al., 2016) the MIT concept, there is no specific theory of MIT. The MIT hypothesis can be explained within the context of neoclassical growth theory and the Lewis-type development model (Ursavaş and Sarıbaş, 2020). The neoclassical steady-state equilibrium, in which per capita income is constant over time due to decreasing returns on capital, can be defined as the MIT. The MIT concept can also be explained within a Lewis-type development model. During the initial stages of the development process, the low-income country can compete internationally by producing labour-intensive and low-cost products using imported technologies. These low-income countries gain significant productivity through the relocation of workers from low-productivity agricultural sectors to high-productivity industries. However, when reaching the middle-income level, the labour supply turns into a labour shortage, and wages begin to rise, resulting in a decline in competitiveness. Eventually, due to the growth slowdown, countries that become less competitive in global markets fall into MIT (Agenor et al., 2012). The second group of studies (Woo et al., 2012; Felipe et al., 2012; Aiyar et al., 2013; Robertson and Ye, 2013; Bulman et al., 2014; Im and Rosenblatt, 2015) define MIT empirically (Glawe and Wagner, 2016). One of the most important empirical definitions of MIT is the growth slowdown methodology proposed by Eichengreen et al. (2011), which suggests that a growth slowdown occurs if the following three conditions are satisfied: (i) a seven-year average GDP per capita growth rate should be at least 3.5% before the slowdown; (ii) the difference between the seven-year average growth rate before and after the growth slowdown should be greater than at least two percentage points; (iii) the GDP per capita should be higher than \$10,000 in the year of a growth slowdown.

The other most used empirical definition of MIT is proposed by Robertson and Ye (2013), who introduced a statistical definition of MIT based on time-series analysis. According to Robertson and Ye (2013)'s approach, the following two conditions must be fulfilled: the expected value, or long-term forecast, country i 's per capita income relative to the reference country is time-invariant and lies within the middle-income band. This definition allows us to determine whether countries are in MIT by checking the stationarity of the related series. Therefore, numerous studies have tested the MIT hypothesis for different samples using various unit root tests after the introduction of Robertson and Ye (2013) methodology. Within this context, following the method of Robertson and Ye (2013), this paper tests the MIT hypothesis for MERCOSUR countries using a novel unit root test of Gómez-Zaldívar et al. (2013). The Southern Common Market (MERCOSUR) was founded in 1991 by four South American countries: Argentina, Brazil, Paraguay, and Uruguay. Venezuela last attended as a full member country in 2012; then, its membership was suspended indefinitely in 2016. Associated members of the organization are Bolivia, Chile, Colombia, Ecuador, Guyana, Peru, and Suriname. The union's primary objective has been to promote a common space that generates business and investment opportunities through the competitive integration of national economies into the global market. It encompasses nearly 15 million square kilometers of territory with a population of

more than 295 million. This territory includes a vast array of natural wealth and treasures, such as water, biodiversity, energy resources, and fertile lands. In 2019, the nominal gross domestic product (GDP) of Mercosur was about \$4.6 trillion. This made it the fifth-largest economy in the world (MERCOSUR, 2022). The motivation to select MERCOSUR countries as a sample is based on several reasons. First, most of these countries have been stuck in middle-income status for several decades. Only one member of the union was among low-income countries in 1987. Five others were among low-middle-income countries, and six were among upper-middle-income countries. While Bolivia consistently stayed low-middle-income throughout the period, only two of them, Uruguay and Chile, managed to rise to the level of high-income countries. The remaining nine countries were clustered around the upper-middle-income level between 1987 and 2021 (World Bank, 2022), which is the first reason why we chose MERCOSUR countries as a sample. When historical GDP per capita data are compared for the last 200 years between MERCOSUR countries, Argentina, Chile, and Uruguay diverged from the rest of the others in the second half of the nineteenth century. Today, not surprisingly, Uruguay and Chile are high-income countries, and Argentina reached this level twice in 2014 and 2017. Venezuela's rapid rise in the 1930s began with oil exports and brought it to the top of the countries within the organization, but this situation ended in the 1990s (Maddison, 2022). The second reason is that the member countries of MERCOSUR mostly have a similar economic and social structure, geography, and colonial history (Bulmer-Thomas, 2014; Koengkan et al., 2020). The third reason is that, to the authors' best knowledge, the MIT hypothesis has not been tested before for MERCOSUR countries.

This paper contributes to the existing literature on two fronts. First, this paper uses a novel unit root test strategy by testing the significance of the trend term and then testing the unit root properties of the series by allowing multiple structural breaks according to the existence/non-existence of the trend term. Second, this paper tests the MIT hypothesis for MERCOSUR countries which have been mostly in the middle-income range for a long time. Besides, to the authors' best knowledge, this study is the first to test the MIT hypothesis for MERCOSUR countries in the literature. The next part of the study summarizes the related empirical literature. Section three presents the data set and econometric methods. Section four gives the empirical results. Finally, section five concludes.

2. Literature Review

Numerous studies have tested the MIT hypothesis, particularly since the pioneering papers of Eichengreen et al. (2011) and Robertson and Ye (2013). One can say that these studies may be classified into two groups regarding the empirical methodology. The first group of studies tested the MIT hypothesis within the framework growth slowdown methodology developed by Eichengreen et al. (2011). As mentioned in the introduction, Eichengreen et al. (2011) defined MIT empirically and analyzed the determinants of the growth slowdown. Using probit regression, the authors show that an increase in income, fertility rate, old-age dependency ratio, and manufacturing employment share increases the likelihood of growth slowdown, whereas trade openness decreases the probability of growth slowdown. Similar to Eichengreen et al. (2011), Aiyar et al. (2013) define MIT as a growth slowdown and show that an increase in the size of the government, dependency ratio, sex ratio, and investment share increases the likelihood of the growth slowdown. The results also show that public debt, trade openness, and agriculture share negatively affect the probability of growth slowdown. Using the growth slowdown methodology proposed by Eichengreen et al. (2011), Jayasooriya (2017) analyzes the determinants of growth slowdown for South Asian countries over the period 1960-2014. The probit regression results show that while an increase in the dependency ratio increases the likelihood of growth slowdown, an increase in fertility rate and population density decreases the probability of growth slowdown. Lee (2020) classifies middle-income countries as *convergence success* and *nonsuccess*. The *convergence success* category consists of middle-income economies that have moved on to high-income status or experienced a rapid convergence process. The results of probit regression show that human capital, life expectancy, the rule of law, investment share, and high-technology exports positively affect the likelihood of convergence success.

The second group of studies has tested the MIT hypothesis using several unit root tests since the pioneering work of Robertson and Ye (2013). As mentioned in the introduction, Robertson and Ye (2013) statistically define MIT. Their approach allows us to test whether countries are in MIT by testing the stationary using unit root tests. Robertson and Ye (2013) show that 19 out of the 46 middle-income countries appear to be in MIT using traditional unit root tests. Koçak and Bulut (2014) show that Turkey is not in the MIT using Lee and Strazicich (2003) and Carrion-i-Silvestre unit root tests. Using augmented Dickey-Fuller (ADF) and Narayan and Popp (2010) unit root tests, Ünlü and Yıldız (2018) test the MIT hypothesis for 71 middle-income countries over the period 1950-2014. The results of ADF and Narayan and Popp (2010) unit root tests show that 35 out of 71 countries appear to be in the MIT. Tiftikçigil et al. (2018) test the MIT hypothesis for E7 countries over the period 1969-2015. The results of traditional and nonlinear unit root tests show that E7 countries do not appear to be in the MIT. Similar to Tiftikçigil et al. (2018), Tıraşoğlu and Karasaç (2018) conclude that Indonesia, Mexico, and Russia are in the MIT using traditional and unit root tests with structural breaks. Ballı et al. (2019) analyze whether Turkey is in MIT using the unit root test of Carrion-i-Silvestre et al. (2009). The results show that Turkey is not in the MIT. Öztürk and Tiftikçigil (2020) test the MIT hypothesis for Turkey over the period 1967-2016. The results of unit root tests

with structural breaks show that Turkey is not in the MIT. Using traditional, Fourier ADF (FADF), and seemingly Unrelated Regressions Fourier ADF (SUR-FADF) unit root tests, Furuoka et al. (2020) examine the MIT hypothesis for one high-income and 14 middle-income countries and reported mixed results. Kızılkaya (2022) test the MIT hypothesis for Turkey over the period 1960–2020. The results of the unit root tests indicate that Turkey does not appear to be in the MIT. Using the panel unit root test with the structural break, Konat (2021) shows that Balkan countries are not in the MIT. Taking Malaysia as the leading country instead of the US, Yaya et al. (2021) show that seven Southeast Asian countries are not in the MIT using the FADF unit root test.

3. Methodology

3.1. Testing Strategy

To test whether a country is in MIT or not, generally, the unit root properties of the following series are tested:

$$x_{i,t} = y_{i,t} - y_{r,t}$$

where $y_{i,t}$ and $y_{r,t}$ show the logarithm of i^{th} country's per capita income and logarithm of the reference country's per capita income in year t . By employing the augmented Dickey-Fuller (ADF) unit root test, we can reveal the integration level of $x_{i,t}$. Test regression of the ADF unit root test can be presented as follows:

$$\Delta x_{i,t} = \beta_1 + \delta \text{trend} + \beta_2 x_{i,t-1} + \sum_{j=1}^p \Delta x_{i,t-j} + \varepsilon_{i,t} \quad (1)$$

where p shows the optimal lag length. The null of a unit root ($H_0 : \beta_2 = 0$) can be tested against the alternative of ($H_o : \beta_2 < 0$) using the following test statistic:

$$\tau = \frac{\beta_2}{se(\beta_2)}$$

The critical values are tabulated by Dickey and Fuller (1981). The rejection of the null shows that the considered country is in the MIT. But Ye and Robertson (2016) stated that the rejection of the null of a unit is a requirement for MIT but not sufficient. To conclude that a country is in the MIT also necessitates the deterministic trend term (*trend*) must be statistically insignificant because a trend indicates that global income distribution will collapse. The nation with the highest coefficient (δ) will become infinitely large compared to all other countries, which violates MIT since MIT disproves the premise that distribution exists. So, along with testing the unit root hypothesis, the significance of δ must also be tested to reveal whether a country is in the MIT or not.

In this study, we follow the test strategies of Elder and Kennedy (2001), Enders (2015), and Ye and Robertson (2016) for testing unit root in the case of uncertainty of trend and suggest a modified test strategy:

- (i) First, test the significance of the trend term by considering two different cases; (a) the series is stationary (b) the series has a unit root.
- (ii) If both situations (a and b) produce similar results, then apply the unit root test with structural breaks by employing / not employing a trend term according to the test results.
- (iii) If cases (a and b) provide contradictory results, then test the null of $\beta_2 = \delta = 0$. If the null is not rejected, test the unit root hypothesis by assuming no trend in the test regression and allowing structural breaks. Else, test the unit root hypothesis by considering a time trend and structural breaks.

3.2. Testing for Trend

We first test the statistical significance of the trend term by considering the stationary and unit root cases. In the case of a stationary series, one can test the null hypothesis of $\alpha_1 = 0$ in the following equation by using a conventional t-test.

$$X_{i,t} = \alpha_0 + \alpha_1 t + u_{i,t} \quad (2)$$

If there is evidence of a unit root, we can use the test statistic of Ventosa-Santaulària and Gómez-Zaldívar (2010). They proposed a new methodology to complement unit root tests to examine for deterministic trend. They suggest estimating Eq. 2 to test the null hypothesis of a driftless unit root against the alternative of a unit root with a drift by using R^2 statistic which converges to a non-standard distribution. The critical values for the R^2 test are tabulated by Ventosa-Santaulària and Gómez-Zaldívar (2010).

If both test statistics (t and R^2) produce similar results, we can apply the appropriate unit root test by considering the existence or non-existence of a trend term. However, if we obtain contradictory results, we consider Eq.1 and test the null of $\beta_2 = \delta = 0$, which corresponds to testing the unit root and the non-significance of the trend term simultaneously. One can test this null hypothesis using the traditional F test and use critical values tabulated by Dickey and Fuller (1981).

If we find the trend term as significant, we can employ Kapetanios (2005) unit root test, which allows for multiple breaks in unit root testing and also includes a trend term in the test equation, else we use Gómez-Zaldívar et al. (2013) unit root test which allows to multiple breaks in unit root testing without the inclusion of the trend term.

3.3. Testing for Unit Root

Since the milestone study of Perron (1989), numerous studies have been introduced to the literature that allows structural breaks while testing for a unit root. For example, Zivot and Andrews (1992) propose a unit root test that allows for an endogenous break, while Lumsdaine and Papell (1995) consider two endogenous breaks in unit root testing. Perron and Vogelsang (1992), Perron (1997), Clemente et al. (1998), Narayan and Popp (2010), Lee and Strazicich (2003, 2013), among others tested the unit root hypothesis by allowing breaks. However, the number of structural breaks is pre-defined in these tests, which could produce biased results in the case of a misidentified number of breaks. Kapetanios (2005) introduced a new unit root test in which both the locations and number of breaks are determined endogenously. We consider the following test equation to apply Kapetanios (2005)'s unit root test:

$$\Delta x_{i,t} = \beta_1 + \delta trend + \beta_2 x_{i,t-1} + \sum_{j=1}^p \Delta x_{i,t-j} + \sum_{l=1}^m \theta_l DU_{l,t} + \sum_{l=1}^m \vartheta_l DT_{l,t} + \varepsilon_{i,t} \tag{3}$$

where m shows the number of structural breaks. The null of the unit root can be tested using:

$$\tau = \hat{\beta}_2 / se(\hat{\beta}_2)$$

where se shows the standard error. Eq. 3 can be regarded as the augmented form of Eq. 1 with dummy variables to allow for structural breaks. $DU_{l,t}$ and $DT_{l,t}$ are the dummy variables which are defined as follows:

$$DU_{l,t} \begin{cases} 1 & \text{while } t > T_{b,i} \\ 0 & \text{else} \end{cases}$$

$$DT_{l,t} \begin{cases} t - T_{b,i} & \text{while } t > T_{b,i} \\ 0 & \text{else} \end{cases}$$

where t shows the time and T_b is the time of the break.

Kapetanios (2005) follows the suggestion of Bai and Perron (1998) to determine the location of breaks:

- In the first step, the maximum number of breaks (m) is determined. The studies in the literature reach a consensus that m can be five. After determining the m , the first break date ($T_{b,1}$) is searched via dummy variables ($DU_{l,t}$, $DT_{l,t}$) among all possible date points¹ and we choose the date which minimizes the sum of squared residuals (SSR). We store τ statistic (τ_1) for one structural break.
- We include the first dummy in the test equation and search for the next break in the remaining part of the sample. After determining the second break via minimum SSR, we compute the new test statistic (τ_2).
- We continue this process (step 1 and step 2) until finding m structural breaks. After this search, we decide the number of breaks by considering the minimum test statistic ($\tau_\omega = \min(\tau_j)$) among the computed statistics ($\tau_1, \tau_2, \dots, \tau_m$). The critical values for τ_ω are tabulated by Kapetanios (2005).

If we find the trend term as significant, we apply Kapetanios's (2005) unit root test to reveal the integration level of the variables; else we use the unit root test proposed by Gómez-Zaldívar et al. (2013), which is a modified version of Kapetanios (2005) unit root test that does not include a trend term. To apply this test, the following test equation is estimated:

$$\Delta x_{i,t} = \beta_1 + \beta_2 x_{i,t-1} + \sum_{j=1}^p \Delta x_{i,t-j} + \sum_{l=1}^m \theta_l DU_{l,t} + \sum_{l=1}^m \vartheta_l DT_{l,t} + \varepsilon_{i,t} \tag{4}$$

The variables and test strategy can be defined as Kapetanios (2005)'s. The critical values for

$$\tau = \hat{\beta}_2 / se(\hat{\beta}_2)$$

are tabulated by Gómez-Zaldívar et al. (2013).

4. Data and Empirical Results

In this research, we test whether the eight MERCOSUR countries (Argentina, Bolivia, Brazil, Colombia, Ecuador, Paraguay, Peru, and Venezuela) are in the MIT or not. We exclude Uruguay and Chile since they are high-income countries according to the World Bank income classification. We also exclude Suriname and Guyana due to data unavailability. We choose the USA as the reference country by following Ye and Robertson (2016). We obtain the per capita GDP (2011 prices) from the Maddison Historical Statistics (Groningen, 2022). Figure 1 illustrates the GDP per capita data of the considered MERCOSUR countries along with the USA.

As can be seen from Fig.1, the per capita GDP of the USA is performing a high performance for the considered period. The data of Venezuela seems to be highest among the MERCOSUR countries between 1950 and 2000. But after the 2000s, a careful inspection shows that things are not going well from an economic point of view for Venezuela. Among them, Argentina seems to experience a stable economy in the considered period.

¹ Since dummy variables are constructed according to the break dates, by examining the values of these variables we can also reveal the time of the break.

We present the average the GDP per capita of the MERCOSUR countries, with % of US GDP per capita, sample size, and sample period in Table 1.

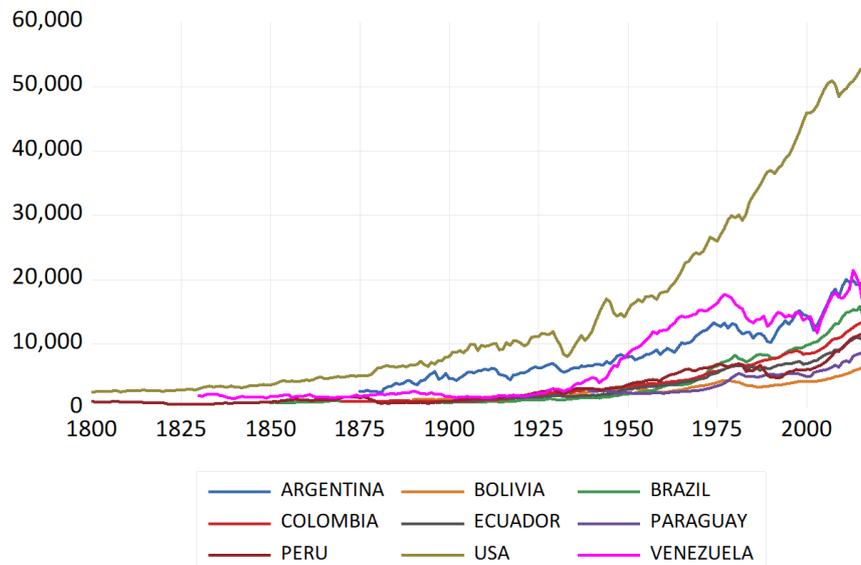


Figure1. The GDP per capita of MERCOSUR and the USA, source: own calculation

Table 1. Descriptive statistics, source: own calculation

Countries	Average	% of US GDP per capita	Sample size	Sample Period
Argentina	8887.351	0.592	144	1875-2018
Bolivia	3017.550	0.201	129	1890-2018
Brazil	3880.295	0.259	169	1850-2018
Colombia	4274.996	0.285	149	1870-2018
Ecuador	4384.966	0.292	119	1900-2018
Paraguay	4364.882	0.291	80	1939-2018
Peru	3039.906	0.203	219	1800-2018
USA	15010.420	1.000	219	1800-2018
Venezuela	6780.593	0.452	189	1830-2018

Table 1 shows Argentina has the highest GDP per capita average while Bolivia has the lowest. Besides, we have 219 observations for Peru and 80 for Paraguay.

We first aim to reveal whether the trend terms are statistically significant before continuing to the testing for a unit root in x_t series:

Table 2. Testing for trend, source: own calculation

	t	R^2	F
Argentina	-14.562*	0.60	0.732
Bolivia	-16.775*	0.69	0.829
Brazil	4.648*	0.12	0.842
Colombia	6.578*	0.23	0.402
Ecuador	6.586*	0.27	0.473
Paraguay	-2.550*	0.08	0.482
Peru	7.463*	0.20	0.332
Venezuela	0.413	0.001	-

Note: * shows the significance at the 1% level. The critical values at the 1% and 10% levels of the t-test are 2.576 and 1.645, respectively. Critical values at the 10% level for the R^2 is 0.84 and for the F is 0.89. t shows the test statistic for testing the significance of the trend term when the series is stationary, R^2 shows the test statistic used for the same purpose when the series has a unit root. F shows the test statistic used for testing the unit root and non-significance of the trend term.

The results of the t-test and R^2 test are different for all series except Venezuela. Both results of the tests show that the trend term is not significant for Venezuela, so we should apply Gómez-Zaldívar et al. (2013) unit root test for

Venezuela. Since these two tests produce contradictory results for the remaining countries, we test the null of a unit root and the non-significance of the trend term for these countries using the F test. The results of the F test indicate that we could not reject the null for all series; that is, the null of a unit root should also be tested, excluding the trend term from the test equation. Consequently, the test results show that we should test the unit root using the unit root test of Gómez-Zaldívar et al. (2013). We apply this test and tabulate the test results in Table 3.

Table 3. Testing for unit root, source: own calculation

Countries	Test Statistics	Optimal Lags	Location of the Breaks				
Argentina	-3.073	9	1870				
Bolivia	-5.897	7	1923	1949	1977	1991	2012
Brazil	-6.480***	13	1878	1891	1945	1967	2006
Colombia	-7.630**	8	1868	1874	1898	1909	1929
Ecuador	-6.489***	6	1923	1939	1945	1986	2010
Paraguay	-5.429	9	1949	1955	1976	1995	2012
Peru	-7.630**	12	1868	1876	1913	1982	2007
Venezuela	-6.179	6	1861	1890	1927	1944	1982

Note: ** and *** show the significance at the %5 and %10 levels, respectively. The critical values at the 10%, 5%, and 1% levels are; -6.3, -6.7, and -12.8, respectively. Optimal lags are chosen using the t-sig approach of Campbell and Perron (1992).

The results in Table 3 provide evidence of stationarity for Brazil, Colombia, Ecuador, and Peru, indicating that these countries are in the MIT. In other words, there are four countries satisfying the MIT definition. The results for Argentina, Bolivia, Paraguay, and Venezuela do not satisfy the MIT definition, indicating that these countries are not in the MIT. We also determine that all series are affected by five breaks except for Argentina's. The break years we observe for countries coincide with significant political, economic, and social events in the countries' history. After one of the most important wars in Latin American history, the War of the Triple Alliance, in 1870, the Argentina government created a new army and consolidated the power formerly spread among the autonomous provinces (Brown, 2010; Lewis, 2001). When the export boom of the 1970s ended with the diversification of products in Bolivia, the national strikes in 1976 caused prolonged political disorder in the country. This turmoil may have caused per capita income to start falling in 1977 (Klein, 2011). In Brazil, the first republican constitution was enacted in 1891, the first attempts at democratization began in 1945, and a new constitution was ratified in 1967 (Baer, 2001). In these critical three years, the Brazilian economy has been on an upward trend. Besides these, coffee exports had a 19% share in Brazil's total exports in the 1820s, increasing to 63% in 1891. The Brazilian economy stagnated in the 1960s and expanded its economy later in this decade by diversifying its exports in favour of industrial products. These developments aligned with the positive economic trend in 1891 and 1867 (Fausto and Fausto, 2014). Although Colombian coffee exports began pretty early, by 1898, they accounted for about half of the country's total exports. The end of the civil wars and political unrest in the 1900s and the increase in export prices may have contributed to the increase in per capita income in 1909. The great strike of banana workers in late 1928 and its suppression by a massacre are regarded as a watershed moment in the economic history of Colombia (Bushnell, 1993; Larosa and Mejia, 2017). Cocoa exports started to increase in Ecuador's second half of the 19th century and stopped in 1920. This was the beginning of a long period of uncertainty in the country's administration. After the elections in 1984, the change to neoliberal policies was seen as the start of a long period of social and political unrest in Ecuador (Torre and Striffler, 2008). Oil exports, which started in Venezuela in 1917, increased approximately a thousand times in 1927. 1944 was the year Venezuela became the second country in oil production (Moron, 1964). When global oil prices, which had risen during the 1970s, began to fall in line with declining demand in 1981, the incomes of oil-exporting countries such as Venezuela started to decrease (Shwadran, 2018). These fluctuations may be interpreted as the most crucial reason for the breaks observed in Venezuela. After the Second World War, Paraguay turned to inward-looking policies, which resulted in the collapse of foreign-exchange reserves, supply-side bottlenecks, and inflationary pressures. After a while, the country returned to orthodoxy (Bulmer-Thomas, 2014). The stagnation of the Paraguayan economy that began in 1949 and ended in 1955 can be explained by those policy transitions.

Our results are partially consistent with the study of Ünlü and Yıldız which finds that Brazil, Colombia, Ecuador, Peru, and Bolivia are not in the MIT, and Our results are not consistent with the studies of Tiftikçigil et al. (2018) and Tıraşoğlu and Karasaç (2018) which show that Brazil is not in the MIT. In general, our results are not consistent with previous studies testing MIT for these countries. There may be possible reasons for these differences. First, we follow a different path to test the hypothesis. Second, our sample covers a wide range of data.

Conclusion

One of the dimensions of sustainable development is economic sustainability. In this context, SDG(s) adopted by United Nations emphasizes the importance of sustained, inclusive, and sustainable economic growth. However, it is observed that many countries fail to achieve sustainable economic growth. Especially, countries are struggling to move up from middle-income level to high-income level, which refers to middle-income trap (MIT). Within this context, this paper tests the MIT hypothesis for eight Southern Common Market (MERCOSUR) countries by using the methodology developed by Robertson and Ye (2013). More specifically, we analyze whether MERCOSUR countries are in the MIT by testing the unit root properties of the series using the test developed by Gómez-Zaldívar et al. (2013), which helps to determine the location and number of structural breaks endogenously. To do so, this paper follows a different way from the related literature by first testing the significance of the trend term and then testing the unit root properties of the series by allowing multiple structural breaks according to the existence/non-existence of the trend term. The results of the unit root test show that four out of eight MERCOSUR countries are in MIT. While Brazil, Colombia, Ecuador, and Peru are in the MIT, Argentina, Bolivia, Paraguay, and Venezuela are not in the MIT.

Although MERCOSUR countries experienced rapid growth in the past, the challenge is whether current drivers of economic growth will support the transformation to a modern sustainable economy. To avoid MIT and to maintain sustainable growth and improvement, several policy recommendations can be proposed. First, the structure of production matters for sustainable growth. Countries should shift their production structure from low-value-added to high-value-added sectors. In these countries, input-based growth has come to an end. Technological advancement will increase total factor productivity and enable these countries to jump into the high-income range. To produce high-technology products, countries should focus on the human capital level. Primary education may be sufficient to produce low-value-added products. However, if these countries want to produce more technologically sophisticated products, they should increase higher education quality and provide a more qualified labor force. Second, developing countries should increase their institutional quality. In recent years, growth theories have indicated that institutional quality is important for sustainable growth. For example, weak institutions may discourage innovation or decrease the effectiveness of resource allocation. Third, these countries should benefit from their demographic structure. The share working-age population is higher in developing countries than in developed countries. However, to benefit from this labor surplus, appropriate education and employment policies are required.

Finally, it is noteworthy to consider the concept of MIT in terms of the COVID-19 pandemic which has affected humanity not only in terms of health but also in terms of economy, hence sustainable development. Because of the COVID pandemic, the worst economic performance occurred in Latin America and South Asia in 2020; both regions' aggregate GDP shrank by 6.7 percent. Among MERCOSUR countries, the GDP of Paraguay, Brazil, and Uruguay decreased less than that of Bolivia, Argentina, and Peru. In response to the decline in GDP, unemployment rates in these countries rose sharply. As evidenced by the historical projections of these countries, increasing global trade has stimulated economic growth, albeit at varying rates. International demand and prices for goods began to increase as Chinese factories started operating earlier than the rest of the world due to better containment. After a steep decline in the first half of 2020, energy and mineral prices surpassed pre-pandemic levels. Even during the earliest stages of the pandemic, agricultural exporting countries in Latin America benefited from rising prices. As a result, MERCOSUR countries averagely grew in 2021 at least as much as they fell in 2020. However, these economies continue to be fragile. A contraction in China, their primary market, would reduce their export volumes. Moreover, the invasion of Russia into Ukraine raises fertilizer costs and, hence, their agricultural expenditures. However, the deterioration of macroeconomic balances during the pandemic contribute to the unpredictability. Restricting rising inflation risks increases already-high interest rates at a time when the U.S. is also raising rates. The future of the revived economic expansion is, therefore, uncertain (World Bank 2021; World Bank 2022). So, the direction of the COVID-19 pandemic spread for the next few years will be decisive for the sustainable development process in these countries, and the rest of the world as well.

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