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The Middle-Income Trap: *Navigating the Ambiguity of the Concept*

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Abstract

This study examines the middle-income trap hypothesis, a concept widely debated in economic literature. This a situation in which economic growth slows down after reaching a middle level and the country is unable to move into the group of high-income countries for a long time. It occurs when the initial successes of industrialisation gradually become exhausted and new growth incentives are not formed quickly enough. But can we really be certain whether a country has fallen into the "trap"? The latter is not a rhetorical question — of the 92 countries classified as middle-income economies by the World Bank in 2000, 27 have moved into the high-income group. The study aims to systematize numerous definitions of the concept and assess how definitional differences influence conclusions about development paths and income group transitions. An econometric analysis reveals that these differences have minimal impact on the factors affecting transition probabilities, making discussions about the fundamentals of trap formation largely definition-independent. Econometric testing also confirms a long-term relationship between sharp economic slowdowns and upward income transitions. At the same time, the definitional diversity complicates applying the hypothesis to specific countries.

Keywords: economic development; middle-income trap; middle-income countries; economic growth; total factor productivity

JEL: E02, O4, O10, O15, O31, O32, O57, J11, J24

Data Availability Statement

The data that support the findings of this study are openly available at: https://figshare.com/articles/dataset/Data_MITH_2024-12_rar/28060127

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SUMMARY

This paper examines the middle-income trap hypothesis (MITH). According to this concept, middle-income countries face structural problems that are specific to them and hinder their progression to the high-income category. The paper systemically categorises different definitions of the MITH and evaluates how these variations affect econometric results and policy implications.

The paper draws the following main conclusions:

1. Academic debate on the middle-income trap is characterized by a high degree of conceptual uncertainty.

   Different definitions of the "trap" lead to widely varying estimates of how many and which countries are caught in this "trap." There are three main approaches to defining MIT:
   - *Qualitative. Based on expert assessment.*
   - *Absolute quantitative. Based on fixed per capita income thresholds.*
   - *Relative quantitative. Based on comparison of per capita income with other countries, such as the United States or the OECD average.*

2. Econometric analysis shows that the factors influencing the transition between income groups are not strongly dependent on the type of definition.

   Econometric testing was conducted to determine the significance of factors contributing to transitions to higher income groups and significant slowdowns in economic growth as defined by Aiyar et al. (2013) *or* Eichengreen et al. (2012, 2014)*: demographic indicators, macroeconomic variables, indicators of innovation potential, and the quality of institutions.*

   The following results were obtained:
   - Many of the factors considered have a significant impact on the likelihood of a substantial slowdown in economic growth and transition to a higher income group.
   - The same variables influence both the significant slowdown in growth and the transition processes, regardless of how income groups are defined.

3. The correlation between episodes of significant economic slowdown and long-term prospects for transition between income groups is statistically significant:
   - Episodes of sharp growth slowdowns have a statistically significant impact on the transition to higher income levels, especially if income groups are defined in relative terms.
   - A significant slowdown in growth may be an early indicator of the formation of a "trap," although not with 100% certainty.

4. A number of factors significantly influence the probability of transitions between income groups. Taking them into account can help countries escape the "middle-income trap":
    - Creating favorable macroeconomic conditions, including sustainably low inflation.
    - Maintaining public debt at moderate levels.
    - Increasing investment attractiveness; attracting both domestic and foreign investment.
    - Developing innovative potential and human capital through education.
    - Improving the quality of public institutions.
    - Supporting stable demographic dynamics.

5. The idea of the "middle-income trap" can be useful as a concept that stimulates and structures public debate on development issues. At the same time, the lack of uniformity in definitions seriously reduces its usefulness as a tool for diagnosing specific economies.

The study contributes to the debate on "economic development traps." According to its findings, the diversity of definitions does not hinder the study of the factors underlying transitions between income groups and the formation of the "middle-income trap." MIT is not a universal phenomenon, but it can be a useful basis for reflection on the challenges of economic development, especially for countries seeking to move from the middle-income group to the high-income group.

INTRODUCTION

The middle-income trap (MIT) has been a popular subject of academic debate on economic development since the late 2000s. The middle-income trap hypothesis (MITH) suggests that there are specific obstacles typical for middle-income countries (MICs) that slow down their transition to the group of high-income countries (HICs). Countries caught in the MIT face an inability to overcome a certain barrier in their development, which leads to an increasing gap with other states and may create risks of socio-political instability. The relevance of the MITH for many economies is considered by the expert community as high (World Bank, 2024).

Countries that fall into the MIT face an inability to overcome a certain barrier in their development, which leads to an increasing gap with more dynamic economies. This gap is not purely quantitative in nature. Countries in chronic stagnation at middle-income levels often see large, highly productive industries coexisting with equally large, low-productivity sectors of the economy (Im and Rosenblatt, 2013). Large groups of the population employed in high- and low-productivity sectors differ radically from each other in terms of disposable income, social characteristics, and lifestyle. Their preferences and interests are difficult to reconcile, which can create risks of socio-political instability. The latter becomes another factor prolonging economic stagnation (Aisen and Veiga, 2011).

Thus, MITH is a popular and intuitively appealing concept. At the same time, over the past two to three decades, a large number of countries have moved into the high-income group according to the World Bank classification[1]. Of the 92 countries that had middle-income status in 2000, 27 had high-income status by 2023. The MIC group has been renewed by about a third in less than a quarter of a century, and its size has been maintained (at a roughly constant level since the late 2000s) by countries moving from the low-income to the middle-income group. This gives us a reason to seriously discuss the MIT concept, its meaning, interpretations, and conclusions made by economists who studied middle-income countries. The question of whether the middle-income trap hypothesis is still relevant also needs to be discussed.

There is no single definition of the MITH in the economic literature. Table 1, expanding on the overview by Glawe and Wagner (2016), outlines three primary approaches to defining the MITH: qualitative, absolute quantitative, and relative quantitative, each with nuanced variations.

The qualitative approach defines the MIT as a socio-economic dysfunction described in qualitative rather than quantitative terms. Introduced by Gill and Kharas (2007, 2015), this approach focuses on development challenges faced by individual countries, avoids technical complexities, and is independent of statistical data and definitional specifics. However, as noted by Felipe, Kumar, and Galope (2014), it relies heavily on

[1] For details, see World Bank country classifications by income level for 2024-2025. Retrieved from https://blogs.worldbank.org/en/opendata/world-bank-country-classifications-by-income-level-for-2024-2025.

subjective expert judgment. Additionally, under this approach, MIT formation factors are in fact postulated, because they are inherently part of the concept[2].

The absolute quantitative approach defines the middle-income trap as a country's inability to surpass a specific per capita income threshold at constant prices, typically expressed in US dollars. This approach is widely used in the literature, including in studies by Eichengreen, Park, and Shin (2012, 2014) and Felipe, Abdon, and Kumar (2012). It also underpins the widely adopted World Bank classification of per capita income levels.

Building on this framework, Eichengreen, Park, and Shin (2012, 2014) were among the first to analyze the factors contributing to sharp economic slowdowns. They employed probit regression on middle-income country data to identify key determinants. Aiyar et al. (2013) later refined the methodology by incorporating total factor productivity (TFP) into their analysis. Their study extended the probit model to panel data covering low-, middle-, and high-income countries to estimate the likelihood of slowdowns.

While these studies provide the foundation for slowdown analysis, subsequent research has introduced modifications. For instance, Ekanayake (2021) estimates the determinants of slowdown by analyzing all variables collectively rather than categorizing them separately, though with a more limited set of variables compared to previous studies. Additionally, Ekanayake's analysis is based on annual slowdowns rather than five-year intervals. Rekha and Babu (2022) further advanced the methodology by incorporating the instrumental variables approach alongside probit analysis. They introduced deindustrialization as a binary regressor influencing the likelihood of a slowdown, using it to estimate determinants through the instrumental variables method.

The key advantage of this approach is its objectivity: the MIT is determined on the basis of measurable quantitative indicators that characterise the economy. The disadvantages include the dependence on data availability and the complexity of the technical details of the methodology. A less obvious problem is that it assumes that all countries, except those with per capita income growth converging to zero, will sooner or later reach the level of high-income countries. At the same time, when the MIT is defined in absolute terms, the presence of significant development problems in a country in the 'trap' will not be questioned by most economists.

In a relative quantitative approach, the MIT is defined as the inability of a country to rise above a certain per capita income compared to developed countries. Most studies use the US economy as a benchmark for comparison, although there are alternatives. For example, Im and Rosenblatt (2015) suggest using the average per capita GDP of high-income OECD countries as a benchmark. The advantages and disadvantages of the relative approach are the same as those of the absolute approach. A specific weakness of the approach is that an economy in the MIT defined this way does not necessarily have acute development problems, as pointed out by, for example, Felipe, Kumar and Galope (2014), or Han and Wei (2015).

[2] According to Gill and Kharas (2015), "the middle-income trap that we described was a trap of policy misdiagnosis when countries failed to match their growth strategies with prevailing structural characteristics of their economies." Thus, a policy misdiagnosis is a key factor behind the MIT by definition.

The absolute definition of the middle-income trap (MIT) is more stringent than the relative one. According to Pruchnik and Zowczak (2017), the absolute MIT was identified 31 times when defined by the duration in the middle-income group (Felipe et al., 2012; Islam, 2015) and 34 times when defined by sharp growth slowdowns (Eichengreen et al., 2012; Aiyar et al., 2013). In contrast, the relative definition identified the MIT 70 times among 96 middle-income countries. This discrepancy arises because income convergence is slow, and GDP per capita dispersion remains wide, keeping most countries closer to the average than to the maximum.

Economic literature offers no definitive answer regarding the relevance of MIT risks, either for individual countries or for middle-income countries as a group. Studies employing qualitative or relative definitions often identify the MIT in most MICs, suggesting high risks of entrapment. However, research using absolute definitions reports significantly fewer instances. More critically, statistical analyses do not consistently confirm an MIT's existence. Many researchers, including Im and Rosenblatt (2015), Han and Wei (2015), and Lee (2018), find no evidence that MICs face greater challenges in transitioning to higher income levels than low-income countries (LICs). Furthermore, studies by Im and Rosenblatt (2015) and Bulman, Eden, and Nguyen (2014) have not corroborated Eichengreen et al.'s (2012, 2014) findings of distinct income ranges where the MIT occurs. Recent work by Patel, Sandefur, and Subramanian (2021) on income convergence over the past 2–3 decades also questions the hypothesis. Despite its conceptual and empirical limitations, the MIT remains valuable as a framework for stimulating public policy debate.

The MITH literature offers valuable insights for developing countries, particularly regarding the determinants of economic growth across income groups and the factors influencing the pace of transitions to higher income levels. Researchers frequently emphasize that growth drivers differ between middle-income and high-income countries, reinforcing the MITH's premise: the need to adapt economic strategies for successfully transitioning from MICs to HICs.

Among the key factors affecting the speed of transition between income groups, researchers highlight institutional framework, level of education, demographic trends, infrastructure capacity, and macroeconomic stability.

The rest of this paper is organised as follows: Section 2 compares per capita GDP of major MICs against income group thresholds using two classifications—an absolute approach, following Felipe et al. (2014), and a relative approach, based on Bulman et al. (2014). Under the absolute classification, many of these economies have long transitioned to HICs, showing no signs of income traps. However, under the relative classification, most top MICs remain below the HIC threshold. Section 3 presents an econometric analysis of factors influencing both significant slowdowns in per capita GDP growth and transitions to higher income groups. Section 4 examines the link between sharp growth slowdowns, as studied by Aiyar et al. (2013) and Eichengreen et al. (2012, 2014), and the long-term probability of transitioning to HICs. Section 5 concludes the paper.

↓ Table 1. The "Middle-Income Trap" in economic literature

Source	MIT definition	MICs definition	Results	Conclusions regarding MITH
Qualitative approaches to MITH				
Gill, Kharas et al. (2007), Kharas and Kohli (2011), Kharas and Kholi (2015)	A situation of social dysfunction: society incorrectly diagnoses or fails to use new strategies of economic growth to replace the accustomed ones	GDP per capita 5,000-10,000 in constant 1990 dollars	The MITH is not questioned; the relevance is illustrated by analysing the evolution of per capita GDP relative to USA GDP (5-45% over 1960-2012).	Many MICs demonstrate signs of being in the MIT.
Absolute quantitative approaches to MITH				
Eichengreen et al. (2012, 2014)	Persistent strong deceleration of GDP growth in the MIC	GDP per capita > 10,000 in constant 2005 dollars	Typical slowdown ranges 15,000–16,000 (2012), 10,000-11,000, and 15,000-16,000 (2014)	The MIT is observed at developmental levels established with high accuracy.
Felipe et al. (2012, 2014)	Long time in MICs (>28 years in LMICs, >14 years in UMICs)	GDP per capita 2,000-11,750 in constant 1990 dollars	Countries move between income groups; long transitions are the norm; fast transitions are more of an anomaly.	Felipe (2012): 5 MICS in MIT. Felipe (2014): MIT is a poorly defined concept. If the word 'trap' is taken literally, MITH does not fit the empirical evidence.
Aiyar et al. (2013)	MIT as a sustained slowdown in the growth of the 'residual' (a concept close to TFP), stronger than in most MICs (of a certain quantile)	GDP per capita 2,000-15,000 in constant 2005 dollars	Sustained abnormal slowdowns are more likely in MICs than in other countries.	MITH reflects reality, although anomalous slowdowns do not only occur in MICs.
Islam (2015)	MIT as an extended stay at UMICs (30 years)	World Bank classification (GNI per capita)	MIT is detected in 12 countries.	MITH is relevant, focus is on links to increasing inequality.

Han, Wei (2015)	MIT as a reduced likelihood of moving to a higher income group for MICs	GDP per capita 2,418-5,550 (LMI), 5,550-15,220 (UMI) in constant 2005 PPP dollars	All MICs eventually move to a higher group. MICs move faster than LICs	MITH in the absolute definition is not confirmed. It is more meaningful to refer not to MITs, but to 'growing' and 'stagnating' MICs
Relative quantitative approaches of MITH				
Woo et al. (2012)	MIT as halting convergence in per capita GDP with the USA (>50 years in MICs)	20-55% of USA GDP per capita in constant 1990 dollars	Several countries have experienced MIT (mostly in South America).	China needs structural reforms to avoid MIT.
Agenor et al. (2012), World Bank (2013)	MIT as halting convergence in per capita GDP with the USA (>49 years in MICs 1960-2008)	Problem countries: 5-45% of USA GDP per capita in constant 2005 dollars. MICs are defined according to the WB classification.	Many countries are in a MIT (China in particular).	MITH is relevant. Countries need a wide range of reforms to avoid MIT.
Im, Rosenblatt (2013)	MIT as a reduced probability of moving to a higher income group for MICs	Different classifications: GDP per capita 15-30% of USA; 30-45% of USA; 45-60% of USA; GDP per capita 1/16-1/8, 1/8-1/4, 1/4-1/2 of USA; classifications with benchmark average per capita GDP OECD HICs; absolute classifications in constant 2005 PPP dollars	MICs move to a higher group, with the majority eventually ending up in HICs. Transition is longer for LICs in MICs and upward to subgroups within MICs. Transitions are generally estimated to be very long. Historically observed rapid transitions into HICs appear to be anomalous. The authors find no support for the hypothesis that growth slows as MICs approach the HICs boundary.	MITH is generally not confirmed, but is useful as a driver of political discussion.
Bulman et al. (2014)	MIT as halting convergence in per capita GDP with the USA (>49 years in MICs)	10-50% of USA GDP per capita in constant 2005 dollars	There is no evidence of unusual stagnation at any income level.	MITH is not confirmed

Robertson, Ye (2015)	MIT as halting convergence in per capita GDP with the USA: convergence with growth rates of reference HIC (US), with per capita GDP level in the range of MICs	8-36% of USA GDP per capita in constant 2005 dollars	MITH is tested by time series analysis methods and is accepted in most cases.	Half of the MICs are in MIT.
Lee (2018)	MIT is defined as a case of a significant slowdown in per capita GDP growth in a country that failed to move into HICs over the history of observations (1960-2014).	5-40% of USA GDP per capita in constant 2011 PPP dollars	The probability of a significant slowdown for UMICs is no higher than for other countries.	MITH is not confirmed.
Patel et al. (2021)	MICs on average do not converge with HICs.	7.85-33.55% of USA GDP per capita in constant 2017 PPP dollars	Since the mid-1990s, there has been convergence in income between countries around the world, with MICs converging to HICs faster than other countries.	MITH is not confirmed.
Imam, Temple (2024)	MIT as a reduced probability of moving to a higher income group for MICs	36-72% of USA GDP per capita in constant 2011 PPP dollars	Moving up to a higher income group takes a long time, but MICs are nothing special in that sense.	The data indicate that there is no absolute convergence with HICs for all countries outside HICs rather than at MITH.

Source: Glawe and Wagner (2016), authors' additions and clarifications.

1. THE MIDDLE-INCOME TRAP: THE LARGEST MIDDLE-INCOME ECONOMIES IN 2004-2023

The economic growth history of MICs can be assessed differently under different formulations of the MITH. Figure 1 plots the per capita GDP of the countries that were the ten largest by GDP among the MICs back in 2004. Their historical trajectories are compared with those for the largest HICs, as well as with the income thresholds of the 'low', 'lower middle', and 'upper middle' income groups of countries proposed by Felipe et al. (2014). Figure 2 compares per capita GDP as a percentage of US per capita GDP in the same way, and the thresholds (in percentage) correspond to those proposed by Bulman et al. (2014).

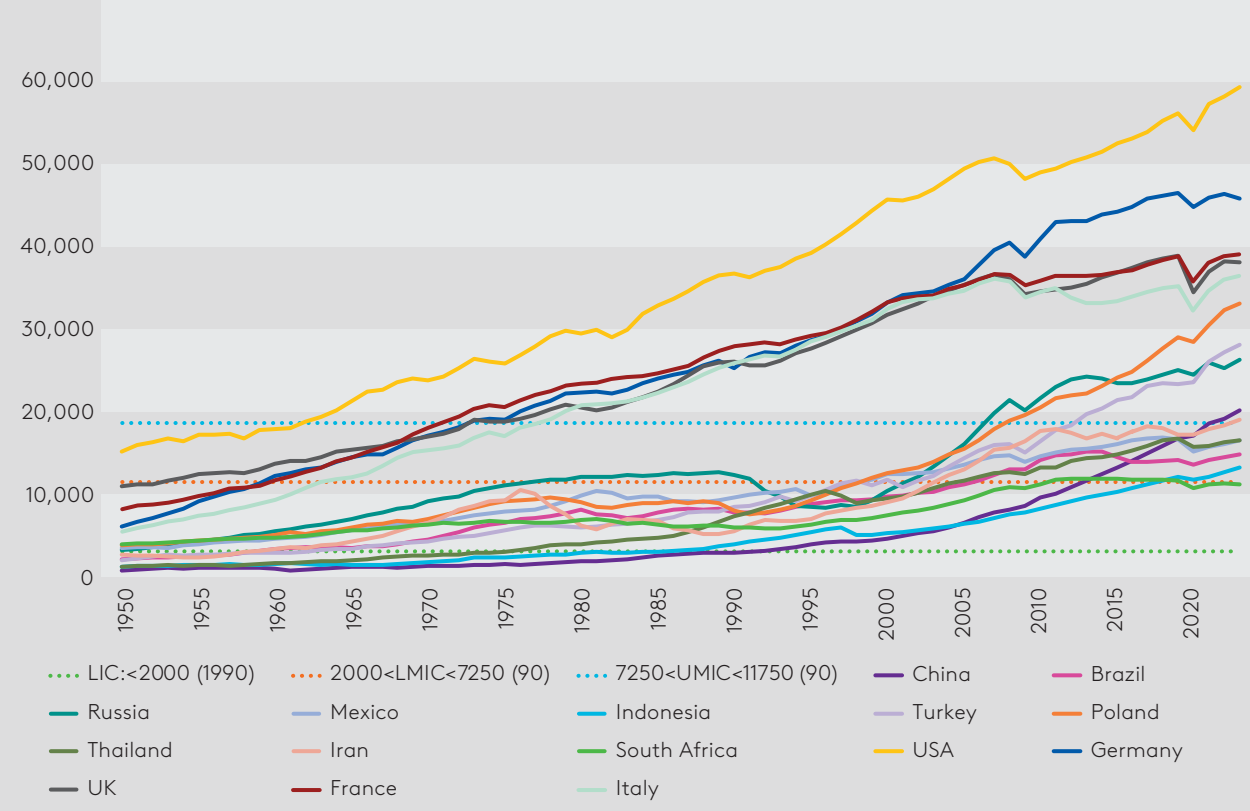
Figure 1 shows that over the past 20 years, many middle-income countries have transitioned to high-income status. Countries such as Türkiye, Poland, and Russia achieved this as early as the late 2000s or early 2010s. In the narrow sense, the MITH does not apply to these nations, as they are no longer classified as MICs, though the broader discussion of economic growth may remain relevant.

Figure 2 presents a contrasting conclusion: most of the MICs analyzed remain below the HIC threshold. Alternative classifications (Table 1) further diversify these conclusions. Notably, using a benchmark other than the U.S. significantly influences results. The comparatively lower GDP levels of other developed countries relative to the US during the 2010s and 2020s enhance the apparent growth outcomes of MICs over this period.

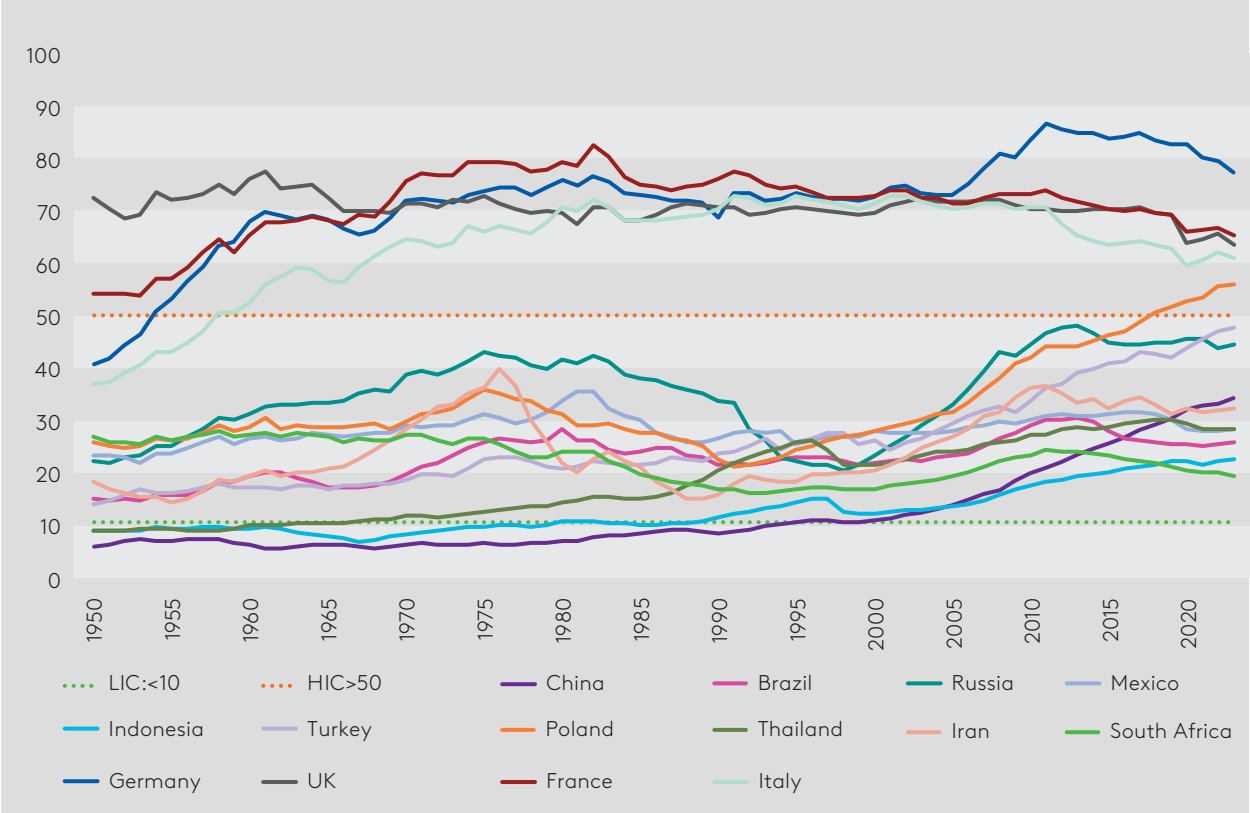
Analyses based on the approaches of Eichengreen et al. (2012, 2014) and Aiyar et al. (2013) show that, over the last 20 years, episodes of sharp slowdown in economic growth were observed in more than half of the countries among the top ten MICs (see Table A.1 in Appendix A). According to the approach of Eichengreen et al. (2014), sharp growth slowdowns were recorded in China between 2009 and 2014, in Russia between 2005 and 2012, and in Iran between 2006 and 2008. According to the criteria of Aiyar et al. (2013), growth slowdown was observed in Russia in 2005-2009, Indonesia in 2014, Mexico in 2005, and Thailand in 1992.

Notably, sharp growth slowdown episodes do not show an obvious correlation with economic development outcomes over the two decades. Countries that moved into HICs or advanced significantly within the MICs group experienced significant growth slowdowns. At the same time, countries that had relatively weakly improved their positions in the group or even back-tracked (South Africa, Brazil) did not experience significant slowdowns in per capita GDP growth over the two decades. Their growth remained stable, but was not fast enough to improve their positions in the classification.

↓ **Figure 1. Per capita GDP in constant prices: 1950-2023 (2011 PPP USD)**



↓ **Figure 2. Per capita GDP in constant prices: 1950-2023 (% of US per capita GDP)**



Sources: Maddison Project Database 2023, authors' calculations. Figures for 2023 are calculated by the authors based on the respective countries' GDP per capita growth estimates in IMF WEO, April 2024.

Note: The income group boundaries in Figure 1 correspond to those proposed by Felipe et al. (2014) when recalculated in constant 2011 dollar prices. The boundaries in Figure 2 coincide with those proposed by Bulman et al. (2014).

Additionally, one can see a sharp divergence of per capita GDP of countries within the group of high-income countries since the second half of the 2000s, and a number of HICs lagged behind the US. This indicates, on the one hand, that growth problems are not unique to MICs and LICs, and, on the other, that the transition to HICs does not eliminate the risk of growth problems at the new higher level of development.

2. EMPIRICAL STRATEGY AND DATA

Following the approach of Aiyar et al. (2013), Eichengreen et al. (2014), and Han and Wei (2015), we analyzed factors influencing transitions to higher income groups. Our dependent variables include: (1) significant economic slowdowns as defined by Aiyar et al. (2013) — episodes of a sharper than usual[3] TFP growth slowdown between successive five-year periods followed by another five-year period of reduced[4] TFP growth; (2) transitions to higher income groups under the World Bank's absolute classification; and (3) transitions under Felipe et al.'s (2014) relative definition. This range of variables is sufficiently representative to identify factors affecting the probability of MIT formation or sharp economic slowdowns across different definitions (Table 1).

Our approach to estimating the determinants of economic slowdown builds on Aiyar et al. (2013), using five-year data intervals to identify slowdowns. We modified the probit model by incorporating random effects for countries and separate time-period effects. Additionally, while existing literature extensively applies probit models to analyze slowdowns (e.g., Aiyar et al., 2013; Jayasooriya, 2017; Lee, 2018), no prior studies have specifically examined the influence of innovation factors on slowdown occurrence. Furthermore, ordinal regression has rarely been used to estimate slowdown determinants across country income groups, with the exception of Chen and Tsai (2012), who applied an ordinal probit model to assess the impact of macroeconomic variables on income inequality, using the Gini coefficient as an ordinal variable.

To address these gaps, we employed a probit model with random effects on panel data to estimate the impact of various factors on the probability of significant economic slowdowns. Additionally, we utilized an ordinal probit model with binary time-period variables to analyze the factors influencing transitions between income groups. The dependent variable was categorized from 0 (low-income group) to 3 (high-income group) based on the World Bank classification and from 0 to 2 in the relative classification. A full list of variables and data sources is provided in Appendix B (Table B.1).

The equation for estimating the impact of various factors on the probability of slowdown is used in the following form:

$$y_{it}^{*} = \alpha + \beta X_{it} + \delta_{i} + \gamma_{t} + \varepsilon_{it}$$

$$y_{it}^{*} > 0 \text{ then } y_{it} = 1$$

[3] I.e. sharper than in 80% of countries during the sample five-year period.

[4] The TFP growth rate during the latter period is reduced in comparison with its growth rate during the period preceding the slowdown to a greater extent than in 80% of countries in the same time. See Aiyar et al. (2013) for details.

$$y^{*}_{it} \leq 0 \text{ then } y_{it} = 0$$

$$P(slowdown = 1) = \Phi(\beta' X_{it} + \delta_i + \varepsilon_{it})$$

where the dependent variable is a binary variable that equals one if a slowdown occurs, $\Phi(\cdot)$ is a normal distribution function, and X_{it} is the vector of explanatory variables for each category, including a constant.

For each category, regressions included lags of explanatory variables and their differences from the previous period. For example, in examining the effect of demographic factors on the slowdown that occurred in 2000-2005, we used the value of the variable as of 2000 as well as its change between 1995 and 2000.

↓ **Table 2. Distribution of observations for model with slowdown**

Category/Period	1960-1965	1965-1970	1970-1975	1975-1980	1980-1985	1985-1990
Demography	51	60	81	82	98	100
Macroeconomics	-	-	-	43	49	53
Institutions	-	-	-	58	73	79
Innovations	-	-	-	-	41	28

Category/Period	1990-1995	1995-2000	2000-2005	2005-2010	2010-2015	2015-2020
Demography	105	112	125	125	125	125
Macroeconomics	60	69	96	107	115	114
Institutions	83	87	96	104	118	123
Innovations	34	52	61	68	80	90

The selection of the final specification for each category was performed using a stepwise method. First, a regression with all possible variables was estimated, then the most insignificant ones were removed until all variables became significant at least at the 10% level. To test the results, the same method was used but in reverse order. One variable was added, and if it was found to be significant, another variable was added. If that variable was found to be insignificant, another variable was used. This procedure was carried out until all variables were significant. In probit analysis, the backward and forward variable selection procedures often coincide with each other. However, if there is inconsistency between them, the procedure that yields a larger number of significant variables was used.

The sample includes 132 countries in 12 periods. The periods are five years, starting with 1960-1965 and ending with 2015-2020. The data set is unbalanced and there are outliers, so the model was estimated separately for each category; if all available variables are used simultaneously in the model, the number of observations will be reduced to 373 observations from 56 slowdowns. At the same time, the data on which the model will be evaluated will be mainly for developed countries. Descriptive statistics can be seen in Appendix B.

An ordered probit model was used for estimating the impact of different factors on the probability of being in a certain income group according to the World Bank classification and relative classification, in the following form:

$$y_{it}^{*} = \alpha + \beta X_{it} + \gamma_{t} + \varepsilon_{it}$$

$$y_{it}^{*} > \mu_{2} \text{ then } y_{it} = 3$$

$$\mu_{2} > y_{it}^{*} > \mu_{12} \text{ then } y_{it} = 2$$

$$\mu_{12} > y_{it}^{*} > 0 \text{ then } y_{it} = 1$$

$$y_{it}^{*} \leq 0 \text{ then } y_{it} = 0$$

$$P(\textit{Income group} = 0) = \Phi(-\beta' X_{it})$$

$$P(\textit{Income group} = 1) = \Phi(\mu_{12} - \beta' X_{it}) - \Phi(\beta' X_{it})$$

$$P(\textit{Income group} = 2) = \Phi(\mu_{2} - \beta' X_{it}) - \Phi(\mu_{1} - \beta' X_{it})$$

$$P(\textit{Income group} = 3) = 1 - \Phi(\mu_{2} - \beta' X_{it})$$

X_{it} is a vector of explanatory variables for each category, including the constant. For relative classification, the same equations were used, except for the last one. Binary variables for time periods were also introduced. The model specification was chosen in the same way as for the model with the slowdown in economic growth as the dependent variable, using a stepwise selection procedure. Regression was run on lagged values five periods back. That is, if we have a variable that denotes the observation income group in 2015, then the value of the regressors in 2010 and their change from 2005 to 2010 are considered.

The World Bank sample includes 184 countries from 1987 to 2023. The model was estimated on annual data and for each category separately. The Relative Classification sample includes 164 countries between 1960 and 2022. The model was also estimated using annual data and for each category separately. Descriptive statistics can be seen in Appendix B.

As shown in Section 1, episodes of substantial slowdowns in economic growth as defined by Aiyar et al. (2013) or Eichengreen et al. (2012, 2014) in leading MICs do not obviously correlate with economic development outcomes from 2004 to 2023. Countries that experienced such slowdowns often transitioned to HICs shortly thereafter, at least in absolute terms. Meanwhile, some MICs that remained in the middle-income category did not experience significant growth slowdowns during the same period (in some cases, throughout the entire observation period).

Given this observation, it is natural to test the hypothesis of a relationship between slowdowns and transitions on a broad sample of countries. To the best of our knowledge, this has never been done in the MIT literature. To formally test the relationship, we use an ordered probit model with the following equation for latent variable:

$$y^{*}_{it} = \beta_1 \cdot slowdown_{t-L} + id_i + \gamma_t + \varepsilon_{it}$$

Here we use a binary variable equal to one at the beginning of the economic slowdown and 0 in other time periods, as well as additional binary variables for countries and periods. The parameter L is the lag (number of years) between the beginning of an economic slowdown and the transition to a higher income group.

In Model 4 we test the effect of slowdowns in the sense of Aiyar et al. (2013) on group transitions in the World Bank classification; in Model 5 we test the effect of slowdowns on groups in the relative classification; in Models 6 and 7 we do the same for slowdowns in the sense of Eichengreen et al. (2012, 2014).

3. RESULTS OF ECONOMETRIC ESTIMATION

3.1. Demography

Demographic factors, including population size, age structure, fertility rates, and migration processes, play a critical role in shaping economic growth rates. Therefore, understanding how demographic trends influence economic development is essential for ensuring sustainable growth in the long term.

Among the primary indicators characterising the demographic situation in countries are population growth rates. A decline in the growth rate of the working-age population—defined as individuals aged 15 to 64—correlates with slower GDP growth (Aksoy et al., 2019). Conversely, rapid population growth may impose challenges on infrastructure, potentially resulting in economic issues such as unemployment and underemployment, which can hinder overall economic growth.

Population Aging is another indicator that reflects the demographic situation. The increasing proportion of older individuals presents a significant challenge for economic growth. As the labour force diminishes due to an aging population, productive activity may decline (Maestas et al., 2023). This demographic shift may decelerate economic growth and intensify pressures on social security systems. Research indicates that countries with aging populations experience slower growth and higher public spending on healthcare and pensions (Aksoy et al., 2019). Other studies, however, suggest that these findings are not universally applicable (Jayawardhana et al., 2023), indicating a need for further investigation.

Sex Ratio is an indicator of the equality of opportunities for men and women in social and economic spheres that is essential for the development of human capital. An imbalanced Sex Ratio can lead to significant negative social and economic consequences. Research indicates that a skewed Sex Ratio favouring males can diminish women's labour force participation (Angrist, 2002). This reduction limits the potential for economic growth by decreasing overall labour supply and diversity.

Fertility Rate: High fertility rates can negatively impact economic growth, as demonstrated by numerous studies (Brander and Dowrick, 1993). One primary reason is the increase in the age dependency ratio, where a larger proportion of young dependents relative to the working-age population strains public and private resources. The transition of societies from high to low fertility is often accompanied by a significant increase in well-being—a phenomenon known as the 'demographic dividend' (Bloom et al., 2003). However, it is important to note that these relationships are not universal. Some studies (Doepke et al., 2022) indicate that fertility levels do

not always negatively affect economic growth. Furthermore, ultra-low fertility rates can also be detrimental, as they contribute to rapid population aging, posing risks to social welfare systems and sustainable economic development.

We analyzed the impact of the demographic indicators listed above on the probabilities of a significant slowdown in TFP growth. The results are presented in Table 3 (see Model 1).

↓ Table 3. Demographic parameters (coefficients and standard deviations)

	Model 1	Model 2	Model 3
Intercept	-2.01*** (0.37)	4.42*** (0.24)	3.23*** (0.18)
Age Dependency	0.01*** (0.00)	-0.07*** (0.00)	-0.06*** (0.00)
Sex Ratio	0.01** (0.00)	0.02*** (0.00)	0.02*** (0.00)
diff(Age Dependency)	-0.02** (0.01)	0.22*** (0.02)	0.08** (0.01)
diff(Sex Ratio)		0.14*** (0.03)	0.21*** (0.03)
diff(Fertility Rate)	0.21** (0.10)	0.18 (0.20)	-1.22*** (0.16)
Sigma	-0.10 (0.16)		
Mu1		1.41*** (0.03)	1.97*** (0.03)
Mu2		2.37*** (0.04)	
Log Likelihood	-617.64	-5,839.88	-6,998.20
AIC	1,269.28	11,763.75	14,130.39
N	1189	6229	9583

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

The analysis indicates that both higher Age Dependency and Sex Ratio increase the probability of a slowdown in TFP growth. The Age Dependency difference is, on the other hand, significant with a negative sign—an increase in this indicator results in a decrease in the probability of a TFP slowdown. Thus, the probability of economic slowdown decreases as this indicator increases, reflecting the realisation of a country's 'demographic dividend.' However, a steady high level of age dependence correlates with an increased probability of a significant slowdown in TFP growth. The fertility rate is significant only in terms of its difference; as the fertility rate rises, the probability of a slowdown temporarily drops.

The results of analysing how demographic parameters affect transition probabilities are also presented in Table 3 (Model 2 for groups in the World Bank classification and Model 3 for the relative classification). The influence of Age Dependency is significant, exhibiting a negative sign in levels and a positive sign in differences in both models. These results are fully consistent with the estimates from Model 1. The fertility rate is not significant in Model 2; however, in Model 3, it is significant as a difference, with the negative effect of higher fertility on transition probability aligning with expectations based on the estimated effect in Model 1. The coefficient estimates in Models 2 and 3 share the same signs and are largely comparable in magnitude, except for the coefficient for Age Dependency difference.

3.2. Macroeconomics

The impact of parameters describing key features of the macroeconomic environment on the long-term outcomes of a country's economic development is widely discussed in the academic literature (see Aiyar et al., 2013; Jayasooriya, 2017). Among the macroeconomic factors of development, those considered potentially significant are the characteristics of the inflationary background, stability of the national currency, investment activity and availability of investment goods, foreign trade activity and terms of trade, debt burden and stability of the financial sector.

We conducted an assessment of the significance of these parameters using the approach outlined in Section 3.1. The results are presented in Table 4.

Parameters such as inflation volatility and the square of the share of investment in GDP — where excessive investment levels may lead to a sustained slowdown in TFP growth, whereas moderate increases may not—significantly contribute to the probability of a slowdown (Model 1). A high value of the terms of trade index for goods and government debt is associated with a low probability of slowdown.

↓ Table 4: Macroeconomic parameters

	Model 1	Model 2	Model 3
Intercept	0.18 (0.84)	2.22** (0.75)	3.62*** (0.74)
Inflation		-0.55*** (0.03)	-0.47*** (0.03)
Inflation volatility	0.10* (0.06)		
Investment share		0.28*** (0.03)	0.22*** (0.03)
Investment share^2	0.001*** (0.001)	-0.005*** (0.001)	-0.004*** (0.000)
Trade		0.002** (0.001)	
Public debt	-0.005** (0.002)	0.006*** (0.001)	0.004*** (0.001)
Commodity ToT	-0.02*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)
FDI		0.03*** (0.01)	0.01** (0.00)
diff(Public debt)		0.017*** (0.004)	0.004* (0.004)
diff(FDI)		-0.019** (0.006)	-0.005* (0.003)
Sigma	-0.47*** (0.11)		
Mu1		0.954*** (0.05)	1.77*** (0.05)
Mu2		1.78*** (0.06)	
Log Likelihood	-337.20	-1,726.78	-1,620.44
AIC	702.40	3,533.56	3,3352.88
N	706	1704	2028

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

The probability of transitioning to a higher income group (Models 2 and 3) is negatively affected by the level of inflation (but not its volatility), the square of the share of investment in GDP, and the terms of trade. The negative impact of the last of these can be explained by the 'Dutch disease.' Additionally, the variance of foreign direct investment negatively affects the transition probability. Conversely, the share of investment in GDP, the size of government debt, the amount of foreign direct investment, and increases in government debt positively influence the transition probability. The share of foreign trade in GDP has a significant positive impact on the probability of transition in Model 2 only.

The estimated coefficients for factors affecting transition probabilities in Models 2 and 3 exhibit the same signs and are comparable in magnitude, with the exception of the coefficients for factors in differences. Additionally, the share of trade in GDP does not have a significant effect on the probability of transition in Model 3.

The slowdown probability (Model 1) is influenced by fewer significant parameters than the transition probabilities (Models 2 and 3). Specifically, the effect of terms of trade on slowdown probability is negative. Consequently, the influence of this parameter on TFP trends and, therefore, GDP growth, follows a different logic than its impact on transitions to higher income groups.

3.3. Potential to Innovate

Many researchers associate the phenomenon of the middle-income trap with a country's lack of innovative potential (World Bank, 2024), which is crucial for increasing productivity, creating new industries, and sustaining economic growth. Thus, middle-income countries should focus on strengthening their innovative potential to transition to the category of HICs.

Indicators characterising the innovative potential of an economy include the proportions of the population with primary, secondary, and higher education; human capital levels; government expenditure on education; and patent activity. We assess their impact on the likelihood of significant slowdowns in TFP growth and the transition to a higher income group within the econometric framework proposed in Section 3.1.

The assessment results are presented in Table 5.

↓ Table 5. Indicators of innovative potential

	Model 1	Model 2	Model 3
Intercept	1.08* (0.59)	-7.51*** (0.50)	-2.98*** (0.60)
Log(Patent applications)	-0.15*** (0.03)	0.22*** (0.01)	0.24*** (0.01)
Primary education	-0.23** (0.08)	0.71*** (0.04)	0.16*** (0.05)
Secondary education		0.50*** (0.04)	0.34*** (0.05)
Government education expenditure		0.15*** (0.02)	
Sigma	-0.14 (0.35)		
Mu1		1.03*** (0.04)	2.59*** (0.07)
Mu2		1.94*** (0.05)	
Log Likelihood	-191.08	-2,486.47	-1,223.12
AIC	404.16	5,056.94	2,538.23
N	454	2353	1439

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

It can be observed that variables such as the number of patent applications and the prevalence of primary education exert a statistically significant negative influence on the likelihood of TFP growth slowdowns (Model 1). Indicators such as secondary education prevalence and the amount of government expenditure on education do not have a significant effect in Model 1. The set of parameters that significantly increase transition probabilities (Model 2 — with groups in the World Bank classification and Model 3 in the relative classification) is broader. It includes secondary education prevalence and, for Model 2, the amount of government expenditure on education. The prevalence of higher education is excluded from the econometric models due to its high correlation with the logarithm of the number of patent applications.

The coefficient estimates characterising the influence of the number of patents and the prevalence of secondary education in Models 2 and 3 are close or comparable. The coefficients characterising the influence of primary education prevalence have a common sign, though they differ significantly. The magnitude of government spending on education has a significant effect on the likelihood of transitioning between groups

in Model 2, but not in Model 3. Only the number of patents and the prevalence of primary education significantly influence the likelihood of a substantial slowdown, while the prevalence of secondary education and high government education expenditure do not.

3.4. Quality of Institutions

Numerous researchers highlight the positive relationship between a country's economic income and the quality of its institutions. Institutions as a factor influencing economic growth trajectories have been actively considered in research literature since the 1970s (North, 1973). At the individual level, institutions provide a conducive environment for creativity, innovation, and the protection of intellectual property rights (Acemoglu, Robinson, 2012), thereby enhancing competition for potential opportunities and creating conditions for increased TFP growth (Hall, 1999). At the sectoral level, they positively impact financial system functioning (La Porta, 1998), entrepreneurship development, and foreign direct investment inflows (Rodrik, 2004). At the national level, a correlation between institutional quality and economic growth is noted: countries that more effectively uphold the rule of law and protect property rights tend to exhibit higher economic growth (Rodrik, 2009; Góes, 2015).

Following Aiyar et al. (2013), we use the following variables as indicators of institutional quality: the role of the state in the economy, rule of law, trade freedom, and regulatory quality. The index of the state's role in the economy is a composite indicator reflecting consolidated budget expenditure on consumption, investment, subsidies, and transfers as a percentage of GDP, the share of state-owned enterprises, and the top income tax rate. The rule of law index is based on data on judicial independence, contract enforcement, military interference in judicial processes, property rights protection, and the scale of regulatory restrictions on property transactions. The trade freedom index reflects taxation on foreign trade, non-tariff barriers, restrictions on currency trading, and cross-border capital transactions. The regulatory quality index measures the strictness of credit, labour market, and business regulations.

We evaluated the significance of these indicators using the methodology outlined in Section 3.1. The results are presented in Table 6.

↓ Table 6. Indicators of quality of public institutions

	Model 1	Model 2	Model 3
Intercept	0.07 (0.25)	-2.47*** (0.21)	-2.43*** (0.24)
Size of government		-0.32*** (0.02)	-0.43*** (0.03)
Rule of law	-0.16*** (0.03)	0.64*** (0.02)	0.58*** (0.03)
Freedom of trade		0.37*** (0.03)	0.48*** (0.03)
diff(Size of government)		0.13* (0.07)	0.22** (0.08)
diff(Rule of law)		-0.82*** (0.18)	-0.57*** (0.20)
diff(Regulation)	0.25** (0.10)	-0.30** (0.11)	-0.26** (0.12)
diff(Regulation)*High Income	-0.43** (0.24)		
diff(Freedom of trade)		-0.33*** (0.07)	-0.41** (0.08)
Sigma	-0.240 (0.129)		
Mu1		1.26*** (0.04)	2.59*** (0.07)
Mu2		2.63*** (0.06)	
Log Likelihood	-384.079	-2460.13	-1657.65
AIC	794.159	4980.26	3373.30
N	821	2919	2912

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Three indicators—the state's role in the economy, rule of law, and trade freedom—exert statistically significant effects on the likelihood of transitioning between income groups (Models 2 and 3, with income groups defined as above). Changes in these indicators also significantly influence transition probabilities. A higher level and increase in the state's role in the economy index reduce the probability of transitioning to a higher group, whereas higher levels and growth in the rule of law and trade freedom indices

increase this probability. The regulatory quality index is insignificant, but its change is significant—an improvement in regulatory quality facilitates transitions to higher income groups; however, once the index stabilises, its impact on transition probability disappears regardless of its level.

Factors that significantly influence the probability of a substantial slowdown in TFP growth (Model 1) are fewer than those affecting transitions between income groups (Models 2 and 3). Statistically significant effects on slowdown probabilities are only seen for the rule of law (higher quality reduces the likelihood of slowdowns) and the difference in regulatory quality (where an improvement reduces slowdown probabilities only in high-income countries).

The influence of institutional factors on transitions weakly depends on the specific classification used to define these groups. Coefficient estimates in Models 2 and 3 are close to each other. Slowdowns in TFP growth (Model 1) depend on fewer institutional factors. The nature of dependencies in Model 1 sometimes differs from that in Models 2 and 3: regulatory quality influences the likelihood of TFP growth slowdowns in a non-linear manner.

3.5. Slowdowns and Transitions: Statistical Analysis of the Relationship

As demonstrated in Section 1, episodes of substantial slowdowns in economic growth as defined by Aiyar et al. (2013) or Eichengreen et al. (2012, 2014) in leading MICs do not obviously correlate with economic development outcomes from 2004 to 2023. Countries that experienced such slowdowns often transitioned to HICs shortly thereafter, at least in absolute terms. Meanwhile, some MICs that remained in the middle-income category did not experience significant growth slowdowns during the same period (in some cases, throughout the entire observation period). Thus it is natural to test the hypothesis of a relationship between slowdowns and transitions on a broad sample of countries. As far as we can tell, this question has not yet been raised in the economic literature on MIT.

The model for assessing the relationship between income group and slowdown is estimated using an ordinal probit model (as described in Section 2). However, the equation for the latent variable differs:

$$y^*_{it} = \beta_1 \cdot slowdown_{t-L} + id_i + \gamma_t + \varepsilon_{it}$$

Here we use a binary variable equal to one during periods of economic slowdown and zero during other time periods, as well as additional binary variables for countries and periods. Parameter L is the lag (number of years) between the onset of economic slowdown and the transition to a higher income group. In Model 4 we test the effect of slowdowns in the sense of Aiyar et al. (2013) on group transitions in the World

Bank classification; in Model 5 we test the effect of slowdowns on groups in the relative classification; in Models 6 and 7 we do the same for slowdowns in the sense of Eichengreen et al. (2012, 2014).

The test results are presented in Table 7.

↓ Table 7. Relationship between slowdowns and transitions

Model	L=11	L=12	L=13	L=14	L=15	L=16	L=17	L=18	L=19	L=20
Model 4	-0.276 (0.187)	-0.400* (0.197)	0.065 (0.210)	0.393 (0.232)	0.410 (0.250)	0.278 (0.253)	0.056 (0.256)	-0.291 (0.261)	-0.653 (0.271)	-0.860** (0.297)
Model 5	-0.019 (0.130)	-0.079 (0.136)	-0.131 (0.140)	-0.098 (0.146)	-0.130 (0.152)	-0.203 (0.159)	-0.366** (0.172)	-0.380** (0.176)	-0.163 (0.179)	0.009 (0.184)
Model 6	0.659* (0.257)	0.538 (0.280)	0.109 (0.291)	-0.419 (0.325)	-0.650* (0.330)	-0.948** (0.341)	-1.007** (0.353)	-0.795* (0.367)	-0.578 (0.357)	-0.305 (0.391)
Model 7	-0.062 (0.139)	0.001 (0.147)	0.000 (0.151)	-0.173 (0.158)	-0.332** (0.166)	-0.525** (0.178)	-0.810*** (0.192)	-0.956*** (0.201)	-0.803*** (0.202)	-0.694*** (0.201)

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

It can be seen that episodes of significant economic slowdown have a significant impact on the probabilities of moving to a higher per capita income group at lag lengths longer than the length of the slowdown episode (10 years in the case of Aiyar et al., 2013, and seven years in the case of Eichengreen et al., 2012 and 2014). A more significant impact is observed in models operating with episodes of slowdown in the sense of Eichengreen et al. (2012, 2014), especially if the definition of income groups is based on relative categorisation.

Judging from the results in Table 7, a significant slowdown in economic growth is a phenomenon that affects the probability of moving to a higher income group in the long run. At the same time, based on the analysis in Section 2, there may be many exceptions to this relationship among the globally most significant MICs.

4. FURTHER DISCUSSION

Our findings on the factors influencing economic slowdowns largely align with previous studies (Eichengreen et al., 2012, 2014; Aiyar et al., 2013; Jayasooriya, 2017; Otsuka et al., 2017, Rekha and Babu, 2022) and are easy to interpret. The findings on the factors affecting income group transitions are also largely intuitive. Nonetheless, some individual variables are exceptions, as they influence slowdowns and transitions in ways that may be unexpected. We shall discuss these cases in this section in more detail.

4.1. Demographic Factors

Our estimates (Table 3) imply that while a high Sex Ratio increases the likelihood of an economic slowdown, it is also associated with a greater probability of transitioning to a higher income group. This apparent contradiction is driven by the presence of Arab nations and island economies that happen to have both high Sex Ratios (heavily male-skewed populations) and high incomes. With no this group in the sample, the effect of Sex Ratio on the transition becomes statistically insignificant. Further exploration of this effect reveals a non-linearity. When separating countries into those with a male-skewed population (Sex Ratio above 100) and those with a female-skewed population (Sex Ratio below 100), we observe opposite effects of a rising Sex Ratio. For countries with Sex Ratios above 100, higher values of this variable are associated with a lower probability of reaching a higher income group. Conversely, in countries with Sex Ratios below 100, an increase in Sex Ratio makes the probability of transiting to a higher income group increase (all results are available upon request). It seems that income transitions are higher for countries with a relatively balanced male-female composition of the population. In countries with low proportion of men, a rising Sex Ratio may enhance labour market dynamics and economic participation, fostering growth. In economies where men significantly outnumber women, a further imbalance may reflect structural inefficiencies, social constraints, or labour market rigidities that hinder economic progress.

4.2. Macroeconomic Factors

Our findings on macroeconomic variables (Table 4) align with those of Aiyar et al. (2013), Eichengreen et al. (2012, 2014), and Jayasooriya (2017), particularly regarding the relationship between the share of investment in GDP and the slowdown probability. Without the squared investment term in Model 1, our estimates also suggest that a higher investment share increases slowdown probability, likely reflecting experiences of unproductive overinvestment. Unlike other literature about economic slowdowns, we chose to introduce a squared investment term in our models, which enabled us to isolate the effects of overinvestment. Our analysis reveals that investment itself does not significantly influence slowdown probability (in Model 1, it turned

out to be statistically insignificant), suggesting that its negative impact stems from overinvestment rather than investment per se.

The effects of commodity terms of trade (ToT) on income group transitions are another result that may raise questions. While favourable ToT conditions reduce the probability of slowdown, they also reduce the probability of reaching a higher income group. This suggests that strong trade conditions drive short-term growth but may impede diversification, preventing long-term income convergence. To further investigate, we tested interaction terms between the share of trade in GDP and ToT. The results indicate that at a high initial share of trade, favourable ToT increases the probability of moving to a higher income group, but a future increase in the share of trade due to good trading conditions reduces this probability. This implies that reliance on commodity exports fosters medium-term growth but can hinder structural transformation.

CONCLUSION

Over the last two decades, the concept of the "middle-income trap" has become common in academic, expert, and policy circles concerned with economic development. We do not aim to prove or reject the hypothesis of the existence of such a trap. The aim of our paper is to contribute to the public debate on this topic: (1) by improving its accuracy by developing as complete a classification of MITH definitions as possible building on the approaches provided by Glawe and Wagner (2016) and Pruchnik and Zowczak (2017), and (2) by providing an econometric analysis of the factors facilitating or constraining the transition of countries to higher income groups.

The paper's findings underscore the diversity in interpretations of the MIT, with definitions categorized into qualitative, absolute, and relative groups. These varying definitions often lead to differing conclusions regarding the likelihood of countries falling into the MIT. The analysis, which examines the ten largest middle-income countries' development paths over the past two decades, reveals that transitions to higher income groups depend significantly on the chosen definition. While some countries may appear to have escaped the MIT using absolute income thresholds, they may still face challenges when relative income measures are applied.

Our analysis also highlights the broad set of factors that influence the likelihood of transitioning to higher income groups or experiencing significant economic slowdowns. These factors include demographics, macroeconomic variables, innovation, and the quality of public institutions. The econometric results suggest that the probabilities of such transitions depend on similar sets of parameters. Such definition-independence eases the discussion of factors affecting the transition between income groups and, consequently, the risks of MIT formation, despite the lack of universal understanding of what the MIT is.

Furthermore, the paper tests the relationship between economic slowdowns and transitions to higher income groups. It finds a long-term connection between economic slowdowns and the probability of moving into higher income categories, particularly when slowdowns are defined in relative terms. Thus, sharp economic slowdowns as they are understood in the MIT literature may indeed be early signs of long stagnation within the group of MICs. Still, as slowdowns depend on different sets of factors than transition probabilities, it may be wrong to identify them with the MIT fully. The formation of the latter may require longer-term inefficiencies.

Based on the analysis, several key conclusions can be drawn. Firstly, numerous definitions of MIC and MITH can be found in economic literature. Significantly different inferences can be drawn from these definitions regarding how often countries fall into the MIT and how problematic it is to be in the MIT. Experts and their audience should be aware of this variety of definitions and their potential impact on inferences.

Secondly, the conclusion as to whether a particular country is in the MIT may vary depending on the definitions used. In addition, reaching such a conclusion requires a long period of observation. Experts and users of their expertise should also be aware of this. Thirdly, econometric analysis shows that the probabilities of transitions between income groups defined in different ways depend on similar factors. The parameters characterising these dependencies are largely consistent in sign and comparable in absolute value. This leads to a third conclusion. On the one hand, the movement of each individual economy between income groups depends on their classification, which complicates discussion from the point of view of MITH. Conversely, it is possible to discuss the patterns that determine the probabilities of transition between groups. Consequently, it is feasible to conduct a productive study of the factors influencing the risk of MIT formation using a large sample of economies over an extended period.

In conclusion, the MIT remains a useful concept for understanding long-term economic development, but it is better suited to large-scale, cross-country analyses conducted over extended periods. Examining individual economies through the lens of this concept is difficult. Policymakers and experts should exercise caution when assigning the label of 'entrapped' to economies, given that the MIT is still an evolving concept. As research continues, the academic community will refine its understanding of the MIT and its underlying causes while avoiding premature conclusions about its applicability to specific countries.

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ABBREVIATIONS

HIC	high-income country
LIC	low-income country
LMIC	lower middle-income country
MIC	middle-income country
MIT	middle-income trap
MITH	middle-income trap hypothesis
MMIC	middle middle-income country
TFP	total factor productivity
ToT	terms of trade
UMIC	upper middle-income country

APPENDIX A

↓ Table A.1. Significant slowdowns between 2000 and 2020: applying the approaches of Eichengreen et al. (2012) and Aiyar et al. (2013).

	Eichengreen et al. (2012) 1991-2017	Aiyar et al. (2013) 1991-2015
Developed countries		
Cyprus	1991	2000, 2002-2003
Finland	2003	1999-2002
Greece	2004, 2006-2007	2005
Iceland	2007	
Ireland	1999-2006	1996-2000
Japan	1991	
Luxembourg	2003-2004	
Malta	2000-2004	1994, 1999-2001, 2003
Norway		1995-1998
Portugal	1991-1992	
Spain	1991	
Middle- and low-income countries		
Asia-Pacific Region		
Brunei		n.a.
Cambodia	2006-2008	
China	2009-2014	1995-1997
Fiji		n.a.
Hong Kong SAR	2008	
Indonesia		1994, 2014
Republic of Korea		
Lao P.D.R.	2015-2017	n.a.
Malaysia		1992

Mongolia		n.a.
Papua New Guinea	2015-2016	
Philippines		1991, 2015
Singapore		1992
Taiwan Province of China		1992, 1995
Thailand		1992
Tonga		
Vietnam		
Europe and Central Asia		
Albania	2008-2011	1997, 2000, 2003-2004, 2010-2012
Armenia	2004-2010	2004-2009
Azerbaijan	n.a.	2007-2012
Belarus	2007-2014	2006-2010
Bosnia and Herzegovina	n.a.	1996-1997, 1999, 2003
Bulgaria	2006-2010	
Croatia	2005-2008	1997-2000
Czech Republic	2006-2008	1997
Estonia	2003-2009	1998-2004
Georgia	n.a.	2006-2011
Hungary	2004-2008	
Kazakhstan	2005-2011	2004-2009, 2012
Kyrgyzstan		2001
Latvia	n.a.	2004-2006
Lithuania	2006-2009	2004
Macedonia	n.a.	2000-2001
Moldova	n.a.	2005-2009, 2015
Poland		
Romania	2006-2010	2005-2007
Russia	2005-2012	2005-2009
Serbia	n.a.	2005-2007, 2010

Slovak Republic	2007-2011	1997-1998
Slovenia	2006-2008	1996-2001
Tajikistan	2005-2008	2005, 2013-2015
Türkiye		
Ukraine	2004-2010	2004-2009
Latin America and the Caribbean		
Argentina	2008-2011	1994-1996, 2008-2009, 2012
Barbados		n.a.
Belize	1991-1995, 2003-2005	n.a.
Bolivia		
Brazil		
Chile	1995-1998	1994, 1996
Colombia		
Costa Rica		
Dominican Republic		1991
Ecuador	2014	1993, 2013-2015
El Salvador		n.a.
Guatemala		
Guyana	2996-2000	n.a.
Haiti		n.a.
Honduras		n.a.
Jamaica	1992-1995	
Mexico		2005
Nicaragua	2016-2017	n.a.
Panama	2012-2017	n.a.
Paraguay	2014, 2016	2011, 2015
Peru	2011-2016	
Trinidad &Tobago	2004-2010	2004, 2007-2012
Uruguay	1997-1998, 2010-2015	1991-1997
Venezuela	n.a.	1993, 2008-2014

The Middle East and North Africa		
Algeria		
Bahrain	1993	2001-2002
Egypt	2010	
Iran	2006-2008	1993-1995
Iraq	1998-2002, 2010	2004-2009, 2013-2014
Israel		
Jordan		2006-2007, 2010
Kuwait	1993-1999, 2006-2008	1994-1998, 2004-2008
Libya	2013	1992-1993, 2006, 2008, 2013
Morocco	1991	
Oman	n.a.	1998-2002
Qatar	2001-2003, 2010	1999-2003, 2011-2014
Saudi Arabia	1992	1991-1995
Syria	1996-1998	1993-1997, 2010
Tunisia	2008-2010	
United Arab Emirates		1998, 2001, 2004
Yemen		2002-2003, 2010-2011
South Asia		
Bangladesh		
India		
Maldives	1996, 1999, 2007-2008	n.a.
Nepal		n.a.
Pakistan		1992
Sri Lanka	2013-2017	1997-2001, 2015
Sub-Saharan Africa		
Angola	n.a.	1992-1995, 2007-2015
Benin		n.a.
Botswana	1991-1993	1991-1992
Burkina Faso	n.a.	2006, 2013-2014
Burundi		n.a.

Cameroon		
Central African Republic		n.a.
Chad	n.a.	1993, 2005-2008, 2015
Congo D.R.	n.a.	1991, 2008-2009, 2013-2015
Republic of Congo		2011-2014
Cote d`Ivoire		1999
Ethiopia	n.a.	1998, 2009-2013
Gabon		1995-1999
Gambia		n.a.
Ghana	2012-2015	1996-1997, 2013-2015
Kenya		1991-1992
Lesotho	2012	n.a.
Malawi	1999	1998-1999, 2014-2015
Mali		
Mauritania		n.a.
Mauritius	1991, 2014-2015	
Mozambique	2008, 2013-2016	2000-2003, 2010-2014
Namibia		2005
Niger		2015
Nigeria	n.a.	2010-2015
Rwanda	2001	2000, 2003
Senegal		
Sierra Leone	2912-2014	n.a.
South Africa		
Sudan	2003	2000, 2007
Swaziland	n.a.	n.a.
Tanzania		2001-2005
Togo		n.a.
Uganda	2009-2012	1997, 2010-2012
Zambia	2010-2014	1993, 2010-2015
Zimbabwe	2013-2017	1992, 1998-2000, 2012-2015

Sources: World Development Indicators (World Bank), Total Economy Database (Conference Board), authors' calculations

APPENDIX B

↓ **Table B.1 Section 3: Variables and sources**

Descriptions	Sources	Category	Start	End	Frequency
Age dependency, Sex ratio, Fertility rate	United Nations	Demography	1955	2023	Annual
Total factor productivity	Conference Board	Macro	1950	2023	Annual
Income groups, GDP in constant 2015 USD prices, Investment share in GDP, External trade share in GDP, Inflation, Foreign direct investment	World Bank	Macro	1960	2023	Annual
Commodity terms of trade	IMF*	Macro	1960	2018	Annual
Public debt	Model 1: IMF Models 2.3: IMF	Macro	1950	2023	Annual
Price of investment goods	Penn World Table	Macro	1950	2019	Annual
Banking crisis	IMF	Macro	1970	2017	Annual
Regulation, Government size, Rule of Law, Freedom of Trade	Fraiser Institute**	Institutions	1970	2022	Annual

* Bertrand Gruss & Suhaib Kebhaj, 2019. "Commodity Terms of Trade: A New Database," IMF Working Papers 2019/021.

** Economic Freedom Ranking 2022.

↓ **Table B.2. Descriptive statistics of the data for Model 1**

Statistic	N	Mean	St. Dev.	Min	Max
Age dependency	1,716	69.635	20.278	17.303	118.451
Sex ratio	1,716	100.196	16.697	77.198	307.488
Fertility rate	1,716	3.938	2.086	0.916	8.864
Investment share	1,174	23.176	8.224	0.000	76.782
Trade	1,194	72.546	52.408	0.021	420.431
Volatility of inflation	1,420	67.085	742.502	0.006	23,706.410
Price of investment	1,420	0.407	0.337	0.006	7.884
Public debt	1,150	51.627	71.537	0.060	2,092.920
Foreign Direct Investment	1,113	3.537	13.435	-15.714	339.788
Banking crisis	1,584	0.078	0.269	0	1
Commodity terms of trade	1,271	97.799	12.877	33.212	131.707
Government size	821	6.314	1.269	2.531	9.553
Rule of Law	821	5.535	1.992	1.703	9.465
Freedom of trade	821	6.691	2.072	0.005	10.000
Regulation	821	5.981	1.561	1.028	9.401
Government expenditure on education	683	4.240	1.592	0.692	12.454
Patent applications	648	10,503.940	56,413.590	1	968,252
Primary education	1,302	5.522	0.992	3	8
Secondary education	1,302	6.458	0.918	4	9

↓ **Table B.3. Descriptive statistics of the data for Models 2, 3**

Statistic	N	Mean	St. Dev.	Min	Max
Age dependency	10,206	70.502	20.622	17.303	121.409
Sex ratio	10,332	100.008	16.031	78.875	319.850
Fertility rate	10,332	3.895	2.049	0.708	8.864
Investment share	7,445	22.954	8.450	0.000	76.782
Trade	7,588	74.762	51.449	0.021	442.620
Foreign Direct Investment	7,242	935.748	45,907.780	0.000	2,394,390.000
Inflation	8,014	51.170	898.711	-72.729	65,374.080
Public debt	2,960	52.477	35.423	0.741	327.720
Price of investment	8,434	0.445	0.692	0.006	34.445
Commodity terms of trade	8,067	98.643	13.376	33.212	150.458
Banking crisis	8,277	0.018	0.132	0	1
Government size	3,810	6.655	1.263	0.679	10.000
Rule of Law	3,807	5.071	1.875	1.300	9.342
Freedom of trade	3,428	7.123	1.453	0.167	10.000
Regulation	3,808	6.235	1.285	1.005	10.000
Primary education	6,495	5.726	0.889	3	9
Secondary education	6,446	6.358	0.884	4	9
Government expenditure on education	3,760	4.395	1.976	0.000	44.334
Patent applications	3,270	12,131.100	74,639.400	1	1,426,644

Research at the EDB website

Macroeconomic Outlook
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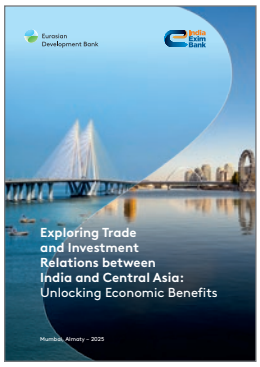
Macroeconomic Outlook 2025–2027

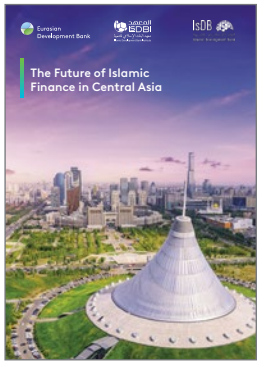
The analysis examines economic developments in early 2025 and outlines key macroeconomic projections for late 2025, as well as forecasts for 2026 and 2027.



Report
(RU/EN)

Exploring Trade and Investment Relations between India and Central Asia: Unlocking Economic Benefits

This joint report focuses on a comprehensive analysis of the current state and potential for improving bilateral trade and investment relations between India and Central Asia, and provides policy recommendations for closer cooperation.



Report
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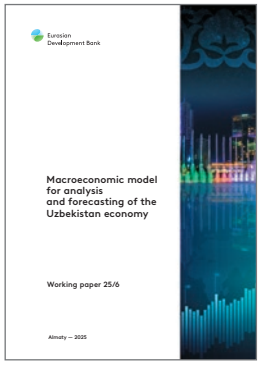
The Future of Islamic Finance in Central Asia

Joint report of the Eurasian Development Bank (EDB), the Islamic Development Bank Institute (IsDBI) and the London Stock Exchange Group (LSEG).



Working Paper 25/6
(RU/EN)

Macroeconomic model for analysis and forecasting of the Uzbekistan economy

The working paper presents the developed model of macroeconomic analysis and forecasting of the Uzbekistan economy. The integration of the new model into the EDB's model complex makes it possible to more accurately and comprehensively forecast the economic development of the Bank's region of operations, while taking into account close cross-country relationships.

Working Paper 25/5
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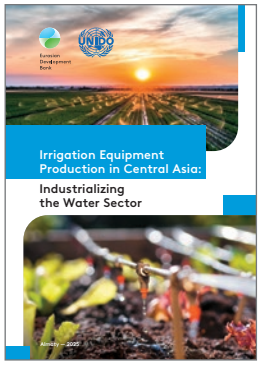
Eurasian Transport Network: Projects Observatory and Interactive Map

This working paper aims to facilitate the monitoring and coordination of infrastructure development along the corridors and routes of the Eurasian Transport Network



Report
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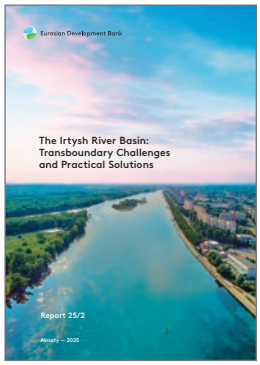
Irrigation Equipment Production in Central Asia: Industrializing the Water Sector

Irrigation equipment production in Central Asia is becoming a strategic area for ensuring food security and efficient water resource management. A new report by EDB and UNIDO provides a detailed analysis of the current state of the market, a forecast of its development and recommendations for creating conditions for local production.



Report 25/2
(RU/EN)

The Irtysh River Basin: Transboundary Challenges and Practical Solutions

A recent study by the Eurasian Development Bank, titled "The Irtysh River Basin: Transboundary Challenges and Practical Solutions", presents the findings of a diagnostic analysis and a forecasting model of the basin's water resources. The study identifies the positions of the three countries involved and puts forward a series of practical solutions, including investment recommendations.

Report 25/1
(RU/EN)

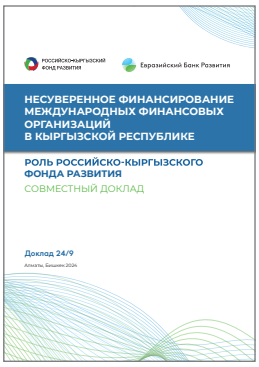
Mutual Investments on the Eurasian Continent: New and Traditional Partners

The report contains detailed information on the scale, dynamics, geographical and sectoral structure of mutual direct investment stock between the countries of the Eurasian region, on the one hand, and China, Türkiye, Iran, and the Gulf states, on the other hand, for the period from 2016 to the first half of 2024.

Report 24/10
(RU/EN)

EDB Monitoring of Mutual Investments — 2024. Eurasian Region

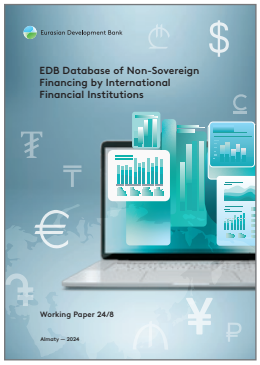
The report contains detailed information on the scale, dynamics, geographical and sectoral structure of mutual direct investments of the Eurasian region from 2016 to 1H of 2024.



Report 24/9
(RU)

Non-sovereign financing of international financial organizations in the Kyrgyz Republic

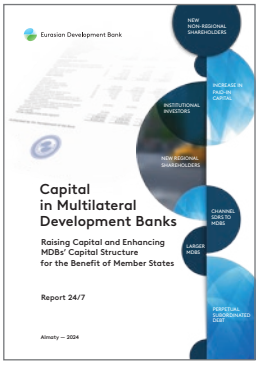
The report contains a comprehensive analysis of non-sovereign financing operations by international financial institutions in the Kyrgyz Republic over the last decade.



Working Paper 24/8
(RU/EN)

EDB Database of Non-Sovereign Financing by International Financial Institutions

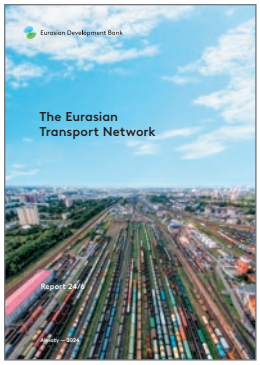
Non-Sovereign Financing (NSF) Database is EDB's new analytical project. The EDB Database is a dynamic tool for timely monitoring and analysis of non-sovereign operations of IFIs in the Eurasian region.



Report 24/7
(RU/EN)

Capital in Multilateral Development Banks

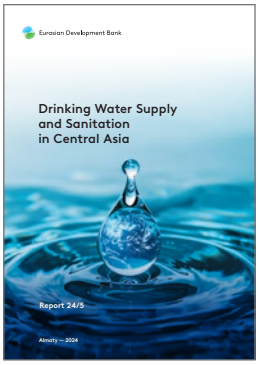
This paper covers the whole 'MDB family' of institutions but highlights regional and sub-regional MDBs because of their specifics of raising shareholders' capital. The study discusses seven standard and novel options for increasing capital.



Report 24/6
(RU/EN)

The Eurasian Transport Network

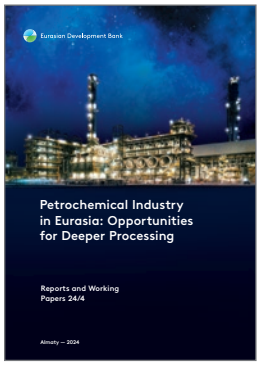
The report examines ten system elements of the Eurasian transport framework concept. Among them are the formation of a transport crossroads in Central Asia, priorities for intraregional transport connectivity, an impetus for realizing the agro-industrial potential of the countries of the region, and improvement of soft infrastructure.



Report 24/5
(RU/EN)

Drinking Wateer Supply and Sanitation in Central Asia

In Central Asia, 10 million people do not have access to safe drinking water. Given the priority importance of drinking water for public health and the scale of the challenges, a comprehensive approach is required in the region. A new EDB report presents a set of practical steps that shape such an approach.



Report 24/4
(RU/EN)

Petrochemical industry in Eurasia: Opportunities for Deeper Processing

The analytical report uses a balance approach to assess the production and export potential of the petrochemical complex of the Eurasian region (Armenia, Belarus, Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan) in the perspective up to 2035.

Report 24/3
(RU/EN)

Infrastructure in Eurasia: short-term and medium-term trends

The EDB's report highlights ten important short- and medium-term investment and institutional trends in the region's energy, transportation, logistics, water supply and telecommunications sectors.

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