SSE RIGA

Bachelor Thesis

Baltic Tigers Facing the Middle-Income Trap?

Authors:

Ernests Bordāns

Madis Teinemaa

Supervisor:

Oļegs Krasnopjorovs

May 2016

Riga

Table of Contents

Abstract

This paper studies the characteristics of *middle income trap* (MIT) and estimates the probability of the Baltic Tigers facing it. We complement the existing literature in three ways. First, we propose an original MIT definition considering major drawbacks of previous researches and compiling unique country-specific benchmarks based on weighted average income growth of trading partners. Second, we construct several multivariate panel data logit models to study which economic, social and political factors could be associated with MIT. Third, we are first to quantitatively assess the probability of the Baltic countries facing MIT. Our results suggest the Baltic countries currently are not trapped since their GDP per capita growth rate exceeds that of comparable middle-income countries, weighted average of trading partners and the EU region; additionally, none of the existing literature's MIT definition suggests that any Baltic economy is trapped. Furthermore, the probability of them facing a MIT is low (somewhat higher in Latvia and Lithuania than in Estonia), compared to other European countries. However, MIT probability of the Baltic countries is likely to rise if further income convergence with advanced countries will not be accompanied with structural reforms. We find that quality of public institutions (especially government effectiveness and control of corruption), business-friendly regulations, income equality, stable macroeconomic environment, prudent fiscal policy as well as developments in higher education, innovation and product sophistication are crucial to avoid MIT in the future.

1. Introduction

Even despite the deep economic recession in 2008-2009 the Baltic States have shown impressive economic performance since the beginning of 21st century. Beating the odds of many, Latvia, Estonia and Lithuania have managed to increase their GDP per capita levels (at PPS) from 36%, 43% and 39% of the European Union average respectively in 2000, to 63% in Latvia and 74% in Estonia and Lithuania respectively in 2014 (Eurostat, 2015). In truth, this rapid catching up was experienced largely because the income gap between the Baltics and the EU was so large (thus, the Baltics had relatively competitive labour market (lower wages), higher marginal returns to capital, opportunity to import technologies etc.) and due some short term economic growth boosts (e.g. credit boom). However, the post-crisis period has experienced a considerable slowdown in the economic growth compared to pre-crisis period, and many suggest that Baltic States might be facing the mysterious *middle income trap* (MIT) (IMF, 2015; OECD, 2015).

Pundits suggest that we cannot expect Baltics to simply keep converging with the EU with the same pace as before given a considerable change in their relative income and overall macroeconomic environment, and remind that that the only European country that has substantially changed its position in GDP per capita ranking in Europe is Ireland. Moreover, there is no consensus about the existence of absolute convergence between countries globally (Sala-i-Martin, 1996).

International Monetary Fund (IMF, 2015) and Bank of Latvia economists (Kasjanovs, 2015) that have discussed the MIT as a threat to the Baltic economies, agree that the current slowdown might not yet mean that we are trapped; however, it indicates a necessity for more profound structural reforms. In a recent study, Staehr (2015) points specifically at the Baltic States facing the risk of MIT; and Swedbank has identified necessity for more growth-friendly government spending in Latvia to avoid the MIT (Strašuna, 2015).

Continued steady growth is a matter of policies and MIT literature suggests that countries at similar development stage as the Baltic States need to revise their economic policy in order to avoid economic slowdown (Ohno, 2009). We want to find out whether based on social and economic indicators, that roughly represent the economic policies pursued, the Baltic States, are ready to avoid the MIT and continue convergence with the European average income.

Even though pundits have conceptually agreed on what is and what might be causing the middle income trap, there is no official definition for MIT. Apparently, it is something that combines being at middle-income level and experiencing low economic growth. Different researchers offer different numeric definitions for such situation; literature has agreed neither on thresholds for middle income level, nor characteristics of *trap.* Thus, the first objective of this paper is to review the literature on each of the component of MIT definition and propose original definition that addresses the drawbacks in previous literature by offering country-specific benchmarks. By applying our definition, we find which middle income countries have historically been or currently are caught in MIT.

The second objective is to study the impact of different economic, social and political factors on the probability of countries being caught in MIT. We construct several multivariate panel data logit models to find factors that are consistently associated with MIT occurrence.

The third objective is to quantitatively assess the probability of each Baltic country facing the MIT. This is achieved by fitting a highly significant multivariate panel data logit model that takes into account all factors that are found to be the most significant during the research.

Research Questions

Hence, we aim at sequentially answering the following research questions:

1) Which countries have historically been or currently are caught in the MIT?
2) What is the current probability of Baltic countries facing the MIT and which Baltic country is most likely to get trapped?
3) Which factors are associated with MIT and what policies particularly Baltic States should implement to avoid MIT?

To our best knowledge, no study taking into account so many explanatory factors and quantitatively assessing the probability of countries facing the MIT has been carried out. By answering our research questions we aim at being able to provide policy recommendations for the Baltic States.

The remainder of the paper is structured as follows: section 2 offers a review of existing literature by paying particular attention to the definition of MIT; section 3 describes the methods used and process of quantitative data analysis; section 4 presents the findings of

MIT occurrence, results of estimated predicted probabilities for the Baltic States and impact of exogenous factors; and section 5 offers discussion of results.

2. Literature Review

2.1. Theory of MIT

In their original paper Gill, Kharas and Bhattasali (2007) were the first to name and discuss MIT as a potential threat to a continued East Asian countries' growth to high income level. They claimed that in order to continue to grow, the East Asian countries must develop economies of scale by continuing to increase the share of high-technology products in their immense international trade, improving the knowledge absorption capacities (via education, property rights, competitiveness), building strong financial system, including peripheric regions in trade networks and eliminating inequality. Since then, researchers have mostly studied the MIT in the context of sustainability of East Asian "miracle", and the slowdown of Latin American and Middle East countries.

When defining the MIT, most papers refer to how Gill et.al. (2007) characterized it initially. To their mind, country is caught in MIT at the point when it is not capable of outcompeting lower-income countries with their factor prices and also not able to compete with the technology and productivity of high-income countries. In other words, the strategy for economic growth at low-income level is not so efficient at middle-income level anymore (Kharas and Kohli, 2011).

The loss of competitiveness among middle-income countries can be explained by W. Arthur Lewis (dual-sector) development model which states that low wages and imitated technology may boost growth at the low-income economies by moving labor from labor-intensive agricultural sector to more productive (and better paid) manufacturing; however, eventually, with rising income, labor-intensive sectors become less competitive and marginal returns from imitated technology decrease. Thus, further growth can only occur with technological advancements based on innovation not imitation (Agenor, Canuto and Jelenic, 2012). Similarly, Ohno (2009) proposes to view the economic development as a four-stage process where slowdown can occur at any transition between the stages. In his view, the MIT occurs when an economy is moving from light manufacturing, that is mostly established by FDI, to a stage where local human capital is developed and share of high-quality production is increasing.

It is important to note that because MIT has not been defined unambiguously and its identification in most researches depends on the definition chosen by authors, we cannot be fully sure that MIT is really a *trap*; i.e. Im and Rosenblatt (2013) conclude that even though it can be observed that middle income countries rarely advance to high income levels and it is a troubling issue, the growth and convergence patterns of middle income countries do not differ that much from the usual path of convergence where human capital, infrastructure, institutions, TFP and investments are crucial for absolute convergence. Similarly, skeptical authors have shown middle income countries do not present signs of consistently lower growth than low-income countries (Bulman, Eden and Nguyen, 2014).

Given that thus far no unified MIT definition exists, but acknowledging the determinative impact that MIT definition has on any further research, in order to define the MIT we must firstly, agree on "middle income level", and secondly - on characteristics of *trap*. Further, we review on what assumptions has previous literature been based; and what are the findings.

2.2. Middle income level definition in the literature

Generally, there are two ways how literature has approached definition of middle income level – either with absolute thresholds or relative thresholds that allow absolute threshold to change over time. Table 1 summarizes the middle income level classifications that previous MIT literature has used[1].

With regards to absolute income level benchmarks, first thing to notice is that these thresholds tend to be very broad. E.g. according to Felipe et.al. (2012) classification, some upper-middle income countries can be roughly six times richer than the lower-middle income countries.

Table 1 Middle income level classifications in literature

World Bank
$1'045 - $4'125 - $12'736 (2014$; GNI per capita)
Felipe, Abdon and Kumar (2012)
$2'988 - $10'833 - $17'557 (2005$; GDP per capita PPP)
Aiyar, Duval, Zhang, Puy, Wu (2013)
$2'000 - $15'000 (2005$; GDP per capita PPP)
Eichengreen (2012; 2014)
$10'000+ (2005$; GDP per capita PPP)
Woo (2012)
20%-55% of USA (GDP per capita PPP)
Robertson, Ye (2013)
8%-36% of USA (GDP per capita PPP)

Created by the authors. Some sources distinguish higher and lower middle income levels; in those the middle number in the table is the threshold.

[1] Felipe et.al. (2012) set benchmarks in 1990 prices; for convenience, we estimate these benchmarks in 2005 prices adjusting them by the historical inflation.

However, can we actually compare the situation in two so different countries, and can we have the same policy recommendations for them? Moreover, the absolute thresholds hold stable over time. Thus, theoretically we could e.g. identify that Honduras (GDP per capita in 1950s was above $2000) was in a MIT back in 1950s and 1960s. However, can we directly compare the economic situation of Honduras during 1960s with that of Spain in 2010, which is also believed to be *trapped*?

At the same time, this absolute threshold would mean that back in 1950s there were practically no high-income economies. However, back in 1960s when the richest countries were advancing to high-income levels (by absolute values) they lived in much poorer world overall, with less developed trading partners, less foreign technologies to imitate and, thus, determinants of their growth might have been different. So, can we apply their lessons to nowadays world? Similarly, Rosenblatt et.al. (2013) points out that if we assume an absolute threshold for middle income, then the majority of high income countries were trapped in MIT in the 20th century because it took very long for them to advance to high-income. This raises a question of whether a middle income trap is fully endogenous problem of countries and being trapped or escaping is a question of their policies regardless of the *time* and income-level of other countries, or is it dependent on how the country looks relatively to others? Moreover, setting a precise absolute benchmark is even more ambiguous task.

MIT is assumed to be a point where a country is stuck because it has not transformed its economy into a productivity-driven one and, thus, it can compete with neither low, nor high income countries (Gill et.al., 2007). This definition inherently assumes that there are wealthier and more productive countries in this world. Furthermore, wealth and productiveness have grown substantially over the last 60 years e.g. one of the *richest* country in the world, USA's per-capita income grew more than three times between 1950 and 2010, and consequently changed the assumption of what are "wealthier and more productive countries" "with which the middle-income countries must compete". In other words, the income level that can be achieved by imitation of foreign technologies increases over time.

Following these logics, it seems obvious that for studying middle-income trap, we need a definition of middle income that includes some dynamic, time-varying trend. However, using a relative benchmark or a catch-up index as a threshold also raises serious ambiguity issues. Firstly, relative benchmarks have been widely criticized because of their underlying assumption of existence of absolute convergence, which does not have a robust empirical

proof (Sala-i-Martin 1996). World Bank (2012) and other researchers point out that – there were 101 countries that had advanced to relative (to USA) middle income benchmark level by 1960; however, only 13 of them had reached high income level by 2008; and five of those are East Asian "miracles" (Felipe et.al., 2012) (Rosenblatt et.al., 2013) (Woo, 2012). But can we really say that all the rest are trapped, if they have experienced growth in absolute terms?

Woo (2012) acknowledges that as the income levels globally have been rising consistently over the last centuries, some dynamic trend must be included in the definition of middle income. He proposes a catch-up index benchmarked to the USA per capita GDP, defining middle income countries as those with income level between 20 and 55% of USA's. The author analyzes data of 1960-2008 and finds that middle income countries tend to converge among themselves (e.g. Latin America) but not catch up with the USA. This methodology does not estimate a precise time period of trap and because of the wide range, we cannot know whether the country was growing at the same pace throughout the whole time periods, or maybe it did not grow during the first years and at one point - rocketed up. Moreover, relative catch-up benchmarks imply that middle-income countries should grow faster than the high-income countries. Some empirical findings support these claims; however, it is arguable whether it is it right to assume that middle income country growing at the same pace as high income is *trapped* forever.

2.3. Middle income trap definition in the literature

Once the benchmarks for middle income level are set (if at all), existing literature on MITs offer us several ways how to identify traps. Generally, two approaches can be taken for identifying traps – statistical methods or intuitive rules (*of thumb*).

With regards to *intuitive* methods, Felipe et.al. (2012) offer identifying countries in the MIT as those that have spent more years as middle income countries than on average countries historically have. They find that the median number of years it took on average for countries to get through the middle income was 42 years. And thus, they estimate that 35 of 52 middle income countries were trapped in 2010.

Advantages of this definition are that authors can estimate the average growth rate necessary for countries to avoid MIT and also specific periods in history when different countries have been trapped. However, this definition also has major flaws. Firstly, authors admit that the number of years spent in middle income largely depend on the historical time period we look at, i.e. the later country entered the lower-middle income level, the shorter time it spent there

on average, and nowadays countries tend to cross the absolute thresholds quicker. Secondly, no consistent data is available for countries before 1950s, thus, we cannot know how long before 1950 some countries had already been in the middle income level. Thirdly, authors' methodology *implies* that there always *must* be countries in the MIT (those that are below average growth) i.e. country can be considered to be trapped simply if it is growing slower than others have been historically. And lastly, given that countries' growth rates could actually differ quite substantially over time such definition makes it almost impossible to analyze the influence of specific exogenous factors on the probability of being trapped.

Eichengreen et.al. (2014) offer another intuitive method for identifying the MIT. They do not define middle income, and simply look at all countries above 10000$ GDP per capita PPP (2005-prices). By employing GDP per capita data starting from 1957 they look for points in time (years) where a country after 7-year (t-7) average annual income growth of at least 3.5% experiences a drop in the average growth for the next 7 years (t+7) by at least 2 percentage points. The time "t" is identified as a slowdown. In case several years in a row are identified as slowdowns, Chow test for these years is employed to find the most significant break point in the growth rate. Eichengreen et.al. (2014) identify that most often slowdowns occur at 10 000 – 11 000$, 15 000 – 16 000$, and around 17 000$ GDP per capita PPP.

Advantage of this methodology is that it identifies years when the slowdown (trap) is the most pronounced and, thus, should work well for studying which factors caused a slowdown. However, the assumptions of this model raise many questions. Firstly, according to Penn World Tables there were only 11 countries with income level above 10 000$ in 1956, thus, this methodology rules out many possible subjects for study. Secondly, the benchmark of 3.5% for growth before the slowdown rules out all countries that have been in a trap for the whole period and never achieved 3.5% growth (e.g. South Africa), and the value of this benchmark seems arbitrary; third, the 2 percentage point growth slowdown is not well justified. For instance, countries that have experienced GDP per capita growth of 10% and now have slowed down to 8% would also be identified as being in a trap.

Using a statistical approach, Aiyar et.al. (2013) assumes middle income level to be 2000 – 15000$ GDP per capita PPP (2005-prices). He gathers consistent data for 138 countries between 1955 and 2009. First, expected GDP per capita growth is predicted for each year by regressing GDP per capita growth on physical capital stock, human capital index and lagged per capita income. Then they identify MIT by looking at the distribution of differences

between the expected growth of economy and the actual; country is identified to be in a trap if the residuals for certain years are in the 20th percentile of all residuals calculated (i.e. the expected growth was substantially larger than the actual). Authors divided the sample into eleven 5-year periods and looked for those 5-year periods that met their definition; 11% of them were found to be in a MIT. They also found that middle income countries experience the slowdowns more frequently than other countries.

The obvious flaw of this methodology is that its accuracy depends on the assumptions of their theoretical growth model (that GDP growth can be predicted by those three factors). Thus, we face the joint-hypothesis problem (when we cannot tell whether their theoretical growth model is wrong or whether MIT do not exist). Moreover, this model would not identify a MIT in countries where MIT is caused or is reflected in low investment in physical and human capital. Hence, it is more of a simple test for the model.

Robertson and Ye (2013) offers another statistical model for defining the MIT by looking particularly at the long-run growth of economies. They assume middle income level to be between 8 – 36% of USA's (assuming it to be the world's technology frontier), and for a country to "qualify" as MIT country, its long-run per capita income forecast should lie in the middle income range and the distribution of the differences between the country's log income level and USA's log income level should be stationary (i.e. countries' income levels are not converging). They find that out of 46 middle income countries, 19 are trapped. To our mind, the main flaw of this definition of MIT is that it does not allow *any* convergence; thus, it might not identify countries that are growing very slowly but have some convergence; or countries that are diverging from the USA.

Furthermore, apart from defining the MIT, there is fair amount of literature focusing on simply determining economic slowdowns. One of the most straightforward ways to try to estimate slowdowns is by using econometric tests that look for structural breaks in series e.g. the Chow test or Quandt-Andrews test; however, these tests generally tell us less about the direction of the break and they identify individual years, rather than a time period that could be assumed MIT. Berg, Ostry and Zettelmeyer (2012) offer a relatively more sophisticated method for identifying breaks in the growth. They define a period that starts with a statistical upbreak in growth (2-3% growth) and ends with a downbreak in growth (or the end of sample) as a "growth spell". The breaks are identified by minimizing the sum of squared residuals between average growth rates before and after the break using the Monte Carlo

simulation. Depending on the minimum years set between the breaks (5 or 8), authors identify 174 to 280 breaks (including both upbreaks and downbreaks) starting from 1950s.

2.4. Literature on MIT determinants

In a qualitative paper, Kharas et.al. (2011) suggest that in order to avoid MIT, apart from the *prerequisites* of manufacturing industry becoming more capital and skill intensive and services as share of GDP increasing, the key strategy should be development of the domestic demand that is necessary as a platform for domestic companies with global ambitions. Relatedly, income inequality might be a reason for country to be stuck in a MIT, as unequal income distribution can lead to domestic demand growing slower than the GDP, and at some point country can face a slowdown because of underinvestment in human capital. Kharas et.al. (2011) recommends three key policy changes – specialization, structural reforms for improving TFP, and decentralization and privatization.

Researchers have employed different intuitive arithmetic and statistical estimation methods like probit, logit and proportional hazard models for studying the determinants of MIT. Aiyar et.al. (2013) employ probit regressions (with binary variable whether a country in a specific year is in MIT or not) and Bayesian averaging as robustness tests, and estimate the impact of 42 different explanatory variables (including lagged and differenced values). They find that better rule of law, less government involvement, lower regulations, lower dependency ratio, higher trade openness, higher investments, services and agriculture as share of GDP, lower capital inflows, larger public debt, smaller distance to trade, higher regional integration and higher export diversification are associated with lower probability of MIT. By employing similar econometric methodology, Eichengreen et.al. (2014; 2011) complements the literature by finding that lower MIT probability is also associated with higher consumption, lower fertility rates, lower employment share in manufacturing, higher share of population with secondary and tertiary education and more high-technology exports.

Furthermore, Berg et.al. (2012) employ proportional hazard model to estimate the expected length of (previously described) “growth spells” (including lagged and differenced factor values). They find that growth is likely to persist if there is current account surplus, more sophisticated exports, openness to FDI, income equality, democratic institutions and macroeconomic stability. Agenor et.al. (2015) employ an overlapping generations simulation model, and find that MIT occurs because of misallocation of talent, low productivity growth,

inefficient labor market, lack of property rights and weak (especially – advanced (e.g. IT)) infrastructure.

All policy recommendations in the literature require structural reforms. Felipe et.al. (2012) emphasize the potential of a country for further structural changes. They estimate revealed comparative advantage (RCA) and apply Hausmann and Klinger (2006) methodology to export data. They find that number of products with RCA, share of core products in exports, product sophistication and uniqueness of country's exports are associated with lower risk of MIT.

Notably, we identify considerable gaps and drawbacks in the previous literature on MIT determinants. Firstly, all previous papers that have used logit or probit estimations have had possible econometric estimations biases, i.e. Aiyar et.al.(2013) and Eichengreen et.al. (2014) do not attempt fitting multivariate regression models that would include more control variables that previous economic growth literature has identified to be relevant; their regression specifications may feature large multicollinearity; and regression specifications include just few significant variables (the insignificant ones are not excluded). Secondly, vast majority of the previous literature has focused simply on identifying the significant factors; however, none has attempted to quantify the actual probability of certain countries facing the MIT or assessed the magnitude of the effect of certain factors on a particular country.

3. Methodology

3.1 Our MIT Definition

Credibility of any findings of this paper are dependent on a successful and appropriate definition of the MIT in context of the Baltic States. As can be seen, the definition of middle income trap is ambiguous and we identify all methodologies to have major flaws. The key characteristics that the definition should inhabit in order to be used for our quantitative analysis are (1) ability to capture a precise time period when the slowdown occurs, (2) *trap* should differ from a short term economic slowdown, (3) countries identified as middle income level must be comparable (at a similar development stage), (4) the definition must take into account global, as well as regional macroeconomic environment (other country income levels and growth) and (5) most importantly, the definition of middle income trap must correspond as much as possible to how the researchers have agreed to characterize it – country stuck between competitive low-wage and high-productivity status. Our key premise is that country can be considered trapped if it is growing slower than it *should be.*

We offer an intuitive middle income trap definition that we believe solves most of the problems identified previously, and that is specifically adjusted for the purpose of our research – to study the Baltic States.

3.1.1. Setting the middle income level

Firstly, we must be sure that we have a comparable set of countries in our study sample and that we can compare these countries over time. As showed by Felipe et.al. (2012) countries at the same absolute income levels have performed substantially different over time, growing much slower historically than countries at the same income level are growing nowadays. Keeping that in mind, we choose to use relative benchmarks for determining middle income countries, and these benchmarks are set accordingly, so that Baltic countries qualify as middle income countries. We define relative income ranges as percentages of the USA's income level (assuming USA to be the World economic leader for the whole time period observed (Robertson et.al., 2013)).

As discussed previously, researchers have chosen to use very different relative middle income level benchmarks. In the context of MIT, Woo (2012) explains that income level of 15-60% of the USA features almost exactly the same set of countries throughout time since 1960s. Considering this and the fact that income level benchmark at 15% of the USA ensures that all Baltic countries are identified to be middle income level for the whole period since their data is observed (since 1990s) we set the bottom benchmark for middle income level at 15% of the USA (that is approximately 2270$ at PPP 2005 $ in 1960 and 6402$ in 2014).

Next, we choose 70% of the USA GDP per capita as the upper benchmark for middle income level because that represents approximately the average income level of the European Union over the time, and we assume that being above the average income level of the one of the richest regions in the world (EU) would imply that country is above the middle income. Baltic States started off in 1990s with the income level at PPP of around 20% of USA and now are approximately halfway through our middle income definition. Setting the respective middle income level benchmarks ensures us that almost half of the countries are European and most African countries are excluded (list of all countries identified as middle income at some point can be found in Appendix A).

3.1.2 Choosing the "trap" criteria

According to our proposed MIT definition, a country is *trapped* in a certain year if it fulfils three country-specific criteria related to its GDP per capita growth rate.

Firstly, we wish to compare each country's growth rate with other countries at similar

economic development stage, to see if the specific country is performing as well as other countries that are also in the transition between labour and technology-intensive industries. However, even within our defined middle income level range, countries at the poles of the defined range have fairly different growth trends over time. Thus, in order to be sure that we compare growth rates of countries across comparable sets, we divide middle-income countries into four groups according to their income level – (1) countries at income level of 15%-20% of the USA, (2) at 20%-30%, (3) at 30%-50% and (4) at 50%-70% of the USA (list of countries in each range may change every year). These income level intervals were chosen (a) to ensure enough observations in each group every year; (b) to make sure that each interval is not too wide and we can expect each set of countries to be similar; and (c) because in recent years all Baltic countries belong to the same (30%-50% of USA) income level interval.

Secondly, keeping in mind that growth rates differ across regions, we compare each country's growth rate with its respective region's average growth rate. According to World Bank classification we divide countries into the following regions – East Asia and Pacific, Europe and Central Asia, European Union (partly overlaps with Europe and Central Asia), Middle East & North Africa & South Asia, Sub-Saharan Africa, Latin America. Most middle income trap definitions offered by previous researchers do not take into account how the external macroeconomic environment impacts country's performance; however, we believe that it is important to control for external factors when studying which internal factors are associated with MIT. And we believe that regional growth is a better proxy for external macroeconomic environment than the World growth rate. Moreover, comparing middle income countries growth rates with region's average growth rate (despite the fact that the regions also include countries at much different income levels) is justifiable because according to the underlying MIT theory, countries that are in MIT should be growing slower than both low and high income countries (as they can compete neither with low-wage countries, nor more productive high-income countries).

Thirdly, we compare each country's growth rate with the weighted average growth rate of its trading partners' in the specific year (weighted by the share of total exports). We believe that having a country-specific benchmark is particularly important, because firstly, the trading partners' growth accounts for external shocks even better than regional growth rate (countries located in periphery areas of their regions might not be affected from regional developments as significantly as from its trading partners); secondly, trading partners' growth rate is an

approximate benchmark of external demand and if country is not able to keep up with the growth in trading partners, it might indicate that there is an issue with country's competitiveness.

To our best knowledge we are the first to create unique country-specific benchmarks for researching middle income traps.

To summarize, our proposed MIT definition is as follows: we consider a country be trapped in middle income during a specific year if its GDP per capita lies in the range of 15-70% of the USA's income level, and its GDP per capita growth rate is lower than a) the average growth rate of other countries globally in its respective income level range (15-20%, 20-30%, 30-50% and 50-70% of the USA), 2) its respective region's average growth, and 3) weighted average growth of each country's trading partners.

3.1.3 Other characteristics of our definition

The key advantage of using all three growth benchmarks lies in the fact that we use all of them together and, thus, account for many limitations that each of the three benchmarks would have if they were used individually and exclusively. If a country is growing slower than each of the benchmark, we can be more certain that the growth of this country is lower than it *should* be.

Similarly, we need several growth benchmarks to avoid a situation when half of the countries would be trapped "by definition". By comparing countries growth rates not only to other middle income countries, we avoid situations when fast-growing middle income countries would be considered trapped just because other middle income countries are growing even faster (a flaw of Felipe et.al., (2012) methodology). Moreover, our definition does not assume that there must definitely be an absolute convergence with the USA.

By using Hodrick-Prescott filter for GDP per capita values (described further in methodology), we remove impact from economic cycles and record slowdown as a middle income trap only when it is related to a long term growth trend. Moreover, we can identify a country to be in MIT even if we do not have long historical GDP per capita data (as is the case for the Baltics).

Nevertheless, we acknowledge that using the USA as a benchmark may be challenged, as this approach assumes that countries at e.g. 50% of the USA's income level in 1960s had the same priorities as countries at 50% income level nowadays; however, it can be the case that countries at the same relative income level in 1960s were still less developed and required

different strategy.

Moreover, we identify few cases when a country was caught in MIT for just one year. Such finding may seem unintuitive as MIT is usually associated with more persistent long term economic trends; however, we still include such observations because given that our GDP per capita data is smoothed, it is unlikely that a country was identified to be in MIT due to one-off event; it rather indicates that this country was on the edge of MIT.

3.2 Estimating the MIT determinants and probability of MIT

In order to estimate the probability of the Baltics facing the MIT and quantitatively assess the impact of different explanatory factors on the probability of MIT we (1) choose control variables for initial assessment of significance of different factors, (2) construct several multivariate panel data logit models, (3) predict the probability of MIT using these models, and (4) study the impact of individual factors by estimating their significance and consistency of the impact across different model specifications.

3.2.1. Multivariate logistic panel data regressions

We employ multivariate panel data logit regressions in order to quantitatively assess the impact of different factors on the probability of MIT and also predict the probability given values of factors for each country. A binary variable indicating whether country in the specific year was trapped or not is always used as the dependent variable.

We choose to perform random effect regressions. Firstly, Hausman specification test implies that performing random effect estimations is appropriate for our data (Hausman and McFadden, 1984); and secondly, fixed effect estimations automatically omit many countries with zero variance in the dependent variable (e.g. countries that have never been trapped).

Furthermore, because all of our factors are continuous (not categorical) variables, estimated marginal effects of our logit regressions can be misleading and not precise (Williams, 2015). Hence, instead of estimating the marginal effects we manually adjust the factors of interest and look at what is the change of predicted probability given different values for explanatory variables. Further in our paper we test our prediction models in the described manner, by altering some of the explanatory factors for the Baltic States.

3.2.2. Choosing the control variables

We cannot fully rely on previous literature when proposing our control variables because, firstly, middle income trap literature is currently still very limited and inconclusive with

regards to its findings; secondly, even economic growth literature is largely indecisive about which factors have consistently significant influence on economic growth (Levine and Renelt, 1992) and, thirdly, our middle income trap definition is original and it is worth testing as many variables as possible.

Findings of cross-country economic growth research are extremely sensitive to the specification of regression model; thus, researchers often find contradicting coefficient signs for the same factors and no clear consensus on the *right* model specification exists (Durlauf and Quah, 1999) (Levine, 1992).

Nevertheless, most economists agree that univariate regressions can be misleading and individual factors should always be studied by using a set of relevant control variables, moreover, there should be some robustness checks (Hosmer, Lemeshow and Sturdivant, 2000) (Sala-i-Matin, 1997). After surveying the literature we find that the most often used control variables in economic growth research are level of GDP per capita, investment share in GDP, population growth, some human capital measure, proxy for trade openness, fertility, world growth, government size and dummies for time periods (but rarely all of them are used together) (Levine and Renelt, 1991).

We choose our control variables based on the following criteria: 1) they must have been used as control variables in previous literature and found to be consistently significant, 2) all chosen control variables must be significant when regressed together and they must maintain their significance in majority of regressions with other factors added to the model, 3) they must have low cross-correlation, 4) they must have sufficient amount of observations in our dataset (starting from 1960s), and 5) their influence on MIT risk must have a clear causality. After testing different factors, we find that GDP per capita, investment level, tertiary education enrolment rate, trade openness and government spending as a share of GDP meets all of our five criteria. Population growth, fertility and dummies for time periods often were not significant when regressed together with other control variables. We do not consider world growth rate as a control variable because it is indirectly included in our MIT definition.

3.2.3. Fitting the model(s)

Firstly, we want to restrict the number of factors for further consideration for inclusion in the prediction models. After choosing five control variables we perform a preliminary assessment of all the rest factors in our dataset. We perform logistic regressions using the five control variables and adding all other variables one by one as the sixth explanatory variable to the

model (we do not perform univariate regressions at all). We consider a variable for further inclusion in the main regression model if its p-value in the regression with control variables is below 0.25 (similar approach for choosing candidates for group regressions is proposed by Bursac, Gauss, Williams and Hosmer (2008).

Secondly, we fit the regression model using a stepwise selection procedure (adding variables to the control variables in the model one by one and eliminating any variable that was added previously if it turns insignificant (there are too many variables for using a backwards selection in our case)). However, when using stepwise selection, the model that we *end up with* is very dependent on what are the first variables that we add to the model and on which we build it[2]. Hence, we repeat the stepwise selection procedure numerous times, each time starting by different variables as the first ones to be considered in the model. Following the recommendations in literature (Peng, Lee and Ingersoll, 2002) (Hoetker, 2007) we base selection of the best model on the following criteria: 1) all variables included in the model must be significant at p=0.05[3], 2) we consider the Wald Chi-Square goodness of fit test when comparing similar models, 3) we validate how precise are the predicted probabilities of the models for those observations that are actually *trapped* or *not trapped*, 4) we consider cross-correlation between the variables in order to avoid multicollinearity (Appendix D), 5) we include those variables that have sufficient amount of historic observations, and 6) we want to have variables representing different categories (e.g. institutions, economic structure, human capital etc.) in order to be sure that the model does not miss any crucial factors.

For robustness check we fit eight additional multivariate prediction models by largely following the same described conditions of a *good* model; however, we compromise for one of the conditions – for instance, including variables with less observations. The alternative models' predicted probabilities are less precise than for the main prediction model, they have fewer explanatory variables and different number of observations; however, all variables are still significant. Variables that are included in the all prediction models can be seen in Appendix C, with our main prediction model marked as Model 1.

[2] This appears because, firstly, there is still some cross-correlation between the variables, thus, the coefficients interact between themselves and, secondly, because we are analysing such a long time period, different variables observations might not overlap and once we add a variable to the model which has less observations than other variables in the model it influences the sample.

[3] Our main prediction model includes two variables significant at 90% level, to compromise for other *good* characteristics of the model.

3.2.4. Individual exogenous factors analysis

The fitted models allow us to make some conclusions about those variables that are included in the model; however, we would still like to analyse also variables that did not fit in the models (they may still be relevant factors and may not be included in the models e.g. because of too low number of observations). Thus, we follow Sala-i-Martin (1997) and Levine (1992) and employ each variable in many different model specifications by using different sets of control variables. The robustness of the impact can be assessed by judging in how many of the regression specifications each variable was found significant.

Each variable in our dataset is regressed in 15 different regression specifications. In our results, we present in how many of the 15 regressions (as percentage) each variable was significant and with what sign.

For choosing the 15 regression specifications we follow Levine (1991) approach (who is analysing robustness of FDI impact on economic growth). This implies having a set of fixed control variables and adding additional relevant variables one by one (and thus having additional regression model when each variable is added). The variables that are added additionally to the five control variables are those variables that are included in the main prediction model. Additionally, we regress each variable of interest by adding it to our main model and four of the alternative models. Appendix E presents an example of our approach to analysing each variable of interest (in this case - population growth)[4].

3.3. Data description

Our data covers 152 countries for the period of 1960-2014. However, among these only 68 countries have been at middle income level at some point during our study time period, see Appendix A for countries and periods under investigation. We follow Aiyar et.al.(2013) and Eichengreen et.al.(2014) and exclude resource-exporter countries whose resource extraction between 1960 and 2013 exceeds 20% of GNI on average[5] based on data of Natural resources depletion (as % of GNI) (WDI, 2015). Similarly as Felipe et.al. (2012), we also exclude microstates (that we define as those with average population of less than 250 000 between

[4] Detailed results (similar to Appendix E) on all other individual regressions are available upon request. We do not attach all regression outputs here because of the large number of such estimation tables.

[5] Countries that we exclude due to their resource richness are Angola, Azerbaijan, Bahrain, Brunei, Darussalam, Bhutan, Congo, Rep., Gabon, Iraq, Kazakhstan, Kuwait, Libya, Nigeria, Oman, Qatar, Saudi Arabia, Turkmenistan, Trinidad and Tobago, Uzbekistan

1960 and 2014) from further analysis[6]. We base all calculations of GDP per capita and growth rates on data from a single database (Penn World Tables 7.1)[7]. The data sample that is finally used for our analysis includes 2154 annual observations.

Following Eichengreen et.al.(2014) we intended to use seven-year average growth rates (t+/-3 years) for cross-country growth rate comparisons, assuming that 7 years is period of economic cycle, so that the smoothed growth would represent income growth based in fundamentals. However, as in that case we would lose the growth rates of last three years, we smooth our GDP per capita data using Hodrick-Prescott (HP) filter[8]. Moreover, we calculate regional growth rates by weighing them by total GDP of countries in each region.

We create a dataset with annual data on the relative wealth and growth of each country's export partners (weighted by the amount of trade), in order to create country specific benchmarks for our MIT definition and use trading partners' relative wealth as one of our factor in quantitative analysis, (IMF Direction of Trade Statistics database, 2016). To our knowledge we are the first to study middle income traps using such specific dataset. The weighted average trading partners' data is compiled by assembling the annual export values between all countries in our dataset from 1960 till 2014, computing weights for each country/ counterparty/year treble (e.g. Estonia's proportional weight as Latvia's export partner in 2014), and calculating the weighted average GDP per capita of trading partners and weighted average trading partners' growth in each year between 1960-2014.

Additionally to absolute values of our factors, we estimate the average value of each factor based on all middle income countries in specific year, and then – estimate what is the value of each country's factor relatively to all middle income country average in that year (e.g. how large was Latvia's tertiary education enrolment rates in 1997 compared to average enrolment

[6] Countries that we exclude are Aruba, Andorra, American Samoa, Antigua and Barbuda, Belize, Bermuda, Brunei Darussalam, Curacao, Cayman Islands, Dominica, Faeroe Islands, Micronesia, Fed. Sts., Grenada, Greenland, Guam, Isle of Man, Kiribati, St. Kitts and Nevis, St. Lucia, Liechtenstein, St. Martin (French part), Monaco, Maldives, Marshall Islands, New Caledonia, Palau, French Polynesia, San Marino, Sao Tome and Principe, Sint Maarten (Dutch part), Seychelles, Tonga, Tuvalu, St. Vincent and the Grenadines, Virgin Islands (U.S.), Vanuatu Samoa

[7] This database (PWT 7.1) features GDP per capita in constant 2005 prices for time period 1950-2010 and is used by most middle income trap researchers (Eichengreen et.al., 2014) (Aiyar et.al., 2013). In order to be able to also study the years of 2010 – 2014 (which are not covered) for the missing years we apply the growth rates of GDP per capita PPP at constant prices data from the World Bank WDI database, and thus, get uninterrupted GDP per capita data until 2014

[8] We set the smoothing parameter λ at 21, in order to maximize the correlation between the estimated 7-year average growth rate and HP-filtered GDP per capita growth rate.

rates among all middle income countries in 1997). Given that our study covers such a long time period, considerable political, social and economic developments that have taken place globally over time can have an influence on the findings of important factors (Levine and Zervos, 1993). A bias in results can be caused e.g. by the fact that countries that had relatively high human capital back in 1960s (and arguably – back then it caused a positive effect on economic growth) at the same time had relatively low level of human capital if compared to nowadays *standards* (as education enrolment rates have increased globally); hence, some factors are less comparable over time. The estimated relative factor values do not completely substitute the absolute values of each factor in our quantitative estimations; they are used as robustness checks and we report results from all regressions - with relative and absolute values of each factor.

Some factors (e.g. GINI index, Economic Freedom Index before 2000, BTI index and other) are not observed in every year; hence, in order not to lose observations, we estimate the missing observations by taking the average value of the closest existing observations. Additionally, for the purpose of consistency, when studying exogenous factors impact, we use a dataset where the values of all independent factors are included as averages of the actual values of current and previous three years. Similar approach by lagging explanatory variables is used by Aiyar et.al. (2013). We believe that such approach is more appropriate in our research because, firstly, we are using smoothed GDP per capita data, and, secondly, we are interested in finding the impact of sustained, structural problems in some of the factors (not short term fluctuations) and these problems should be pronounced enough to also be observed when averaged over several years.

The list of explanatory factors whose impact on the MIT we test can be found in Appendix J.

4. Empirical results

4.1. Findings of the MIT

Out of 2154 total middle income level countries observations for time period of 1960 – 2014, 689 (32%) are trapped. Our observed frequency is lower than e.g. for Felipe et.al. (2012) who assumed that country is trapped if it grows through middle income level in more years than other countries on average (which should yield approximately 50% frequency); however, our frequency is substantially higher than was found by Aiyar et.al. (2013) who estimated it to be around 11%. Note, however, that MIT probability cannot be compared directly to other papers as the MIT definitions are different.

We find that the Baltic countries currently are not caught in the MIT; and among European countries, Spain, Croatia, Cyprus, Portugal, Greece, Italy and Slovenia are currently trapped (Italy slipped back into middle income level from high income level in 2010, see Appendix A). Figures 2 below shows that the Baltic States have been avoiding the MIT since 1994 with a great confidence beating all three middle income trap growth thresholds (regional, trading partners and other middle income countries growth rates). Nevertheless, the economic recession has had a significant influence on all three Baltic States growth rates, and Latvia's growth rate during 2009-2012 dropped somewhat below that of trading partners.

Frequency of middle income trap is different among regions; during the years of 1960-2014 Latin American countries were caught in trap in around 45% of all observations. Moreover, most Latin American countries were trapped during the years of 1960-1988 (see Figure 3). Such finding is consistent with previous literature. Without naming it "middle income trap" Cimoli and Correa (2002) describe Latin America being caught in a "low growth trap" due to their transition period. East Asia and Pacific region (middle income) countries have been performing exceptionally well throughout our study period (MIT frequency has been just 11%), and apart from featuring some of the largest success stories of middle income countries historically (e.g. South Korea and Singapore), also other countries have avoided prolonged economic slowdowns, except for New Zealand in 1980s – 1990s. The average frequency of MITs observed in the EU between 1960 and 2014 is 25%.

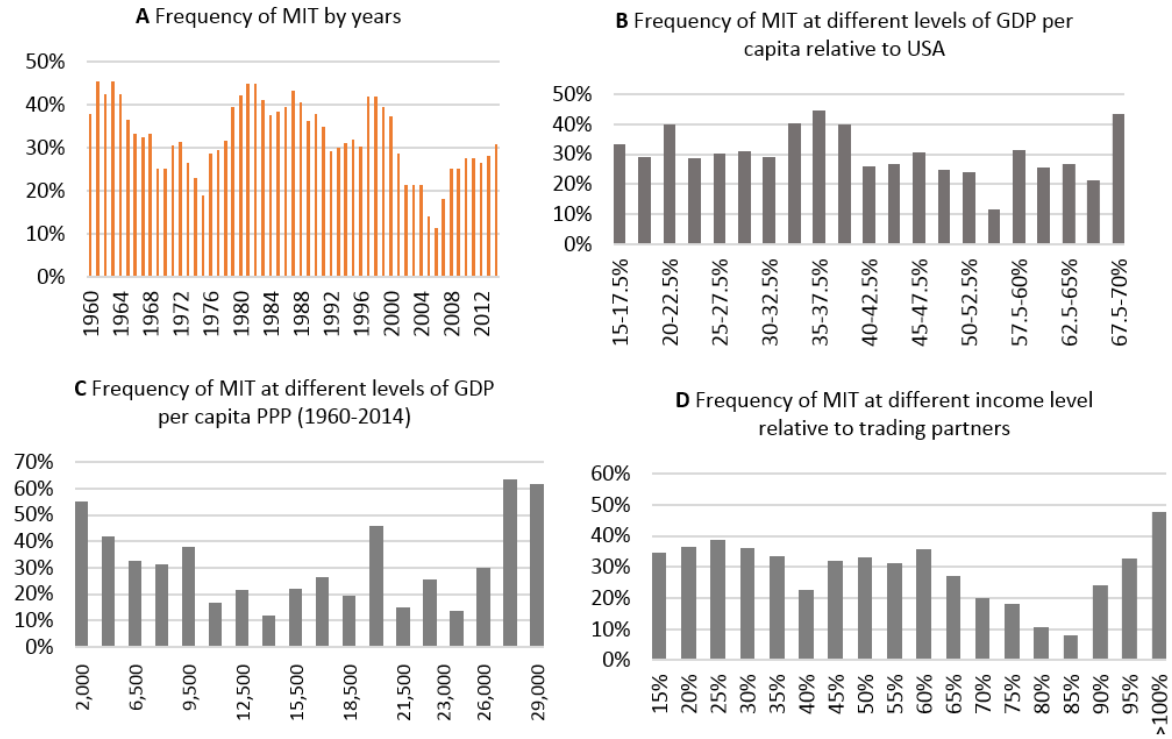
Our identified middle income traps usually occur for several consecutive years, and that is consistent with the theoretical assumption that middle income trap is more than a short term economic slowdown, and country can be caught in a bad equilibrium for a prolonged time period. Hence, having identified long term periods of unreasonably low growth, we should be able find the right causes of MIT.

MIT frequency has not been constant over time (see Figure 1a). Particularly, during the years of mid-1960s to 1980 the frequency of slowdowns dropped on average well below 30%. However, between 1980 and 2000 middle income traps occurred relatively more often (one of the reason can be the collapse of USSR and "new" trapped middle income countries entered the dataset); and then, together with the global economic boom the MIT frequency dropped again in early 2000s.

Notably, countries at income level of 32.5-40% of the USA has had a considerably higher frequency of MITs than at other income levels (see Figure 1b) This is a relevant finding given that Latvia and Lithuania are currently at around 33% and 37% of USA income level respectively.

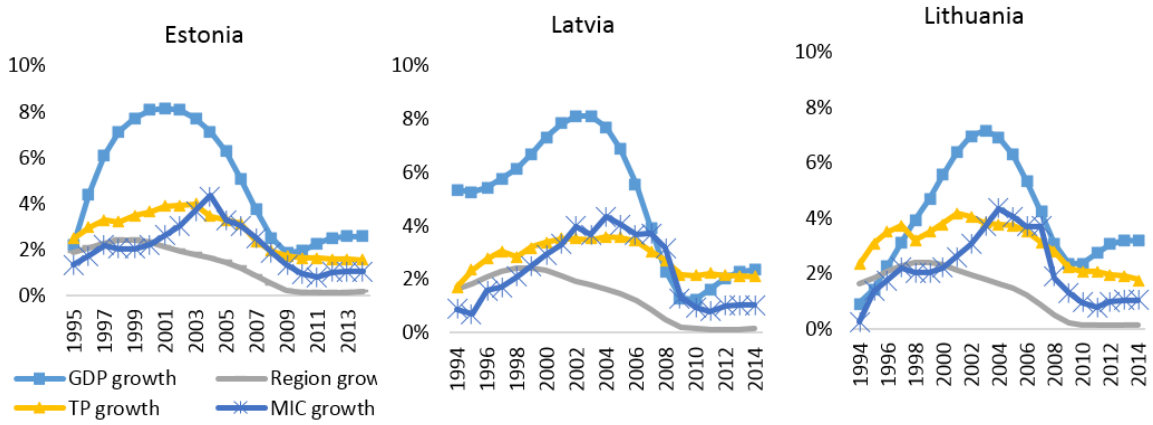
Countries at income level of around 65-85% relatively to their trading partners on average have experienced traps less often than countries at lower or higher income levels relatively to their trading partners; that suggests that decreased wealth gap between home country and trading partners might not be causing MIT per se. Estonia's and Lithuania's wealth relatively to their trading partners is almost 70%; whereas, for Latvia - around 62%.

Figure 1 Frequency of MIT by years, absolute and relative income levels.



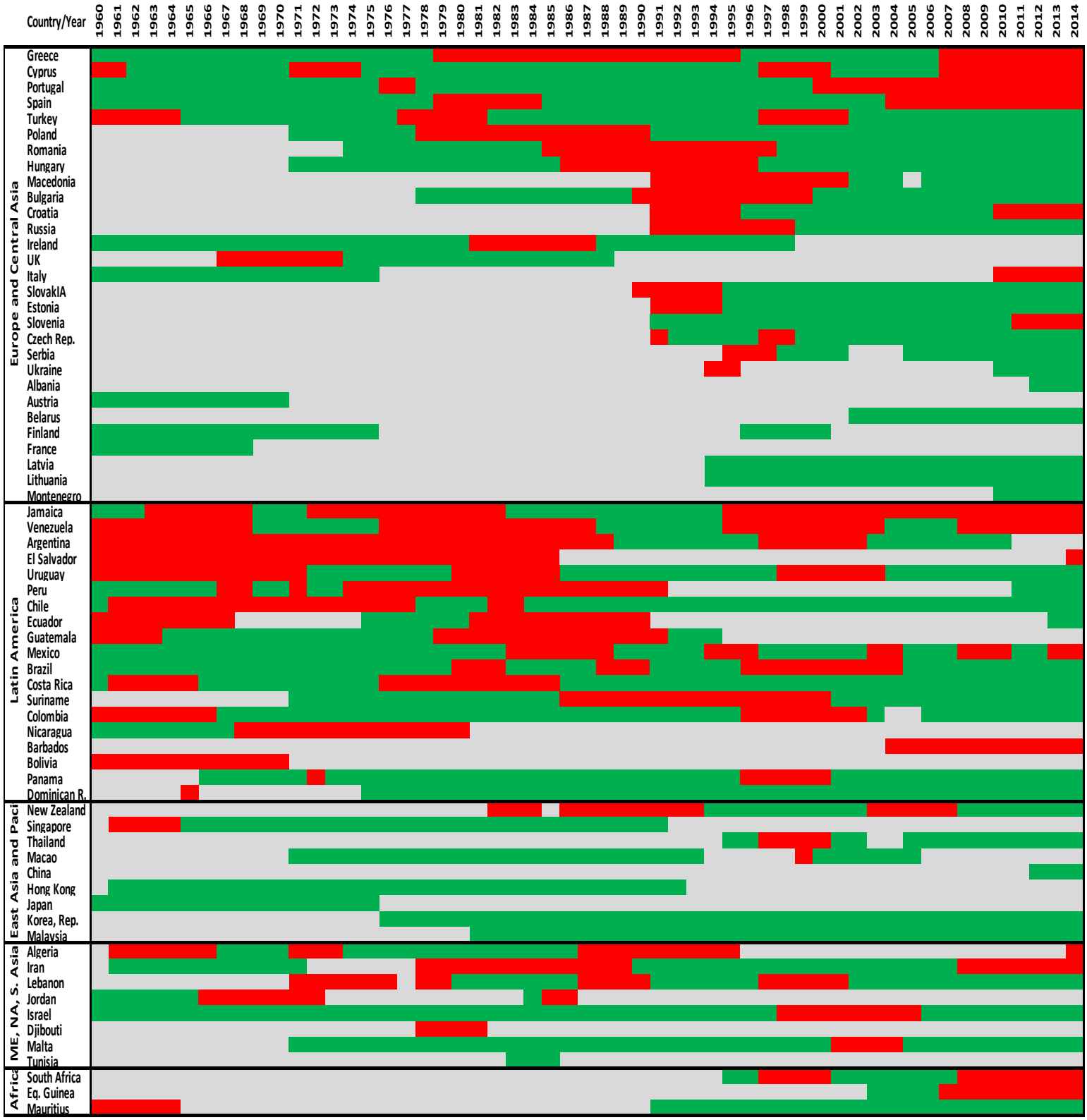
Created by the authors.

Figure 2 Baltic countries GDP PPP per capita growth rates compared to MIT definition thresholds (income growth of trading partners, region and average of middle income countries in specific income range where the country belongs to).



Created by the authors.

Figure 3 Middle Income Traps from 1960 – 2014.



Created by the authors. Grey colour represents either missing GDP per capita data or the country being outside the middle income level. Green colour represents a middle income country that is not trapped, red colour – a trapped middle income country.

4.2. Results of regression models with exogenous MIT probability determinants

Appendix C presents the significance and signs of factors that are included in our prediction models; in addition, Tables 2, 3, 4 present the findings on factors that were excluded from the prediction models but which we analysed individually by employing in different regression specifications (we also analyse individually all variables that were included in the prediction models and report these results in Tables 2, 3, 4). In the Tables we indicate in how many of the 15 regression specifications (as percentage) each variable of interest was significant; if significant, what was the estimated impact on probability of MIT; and whether the variable was significant when included in the main regression model. Moreover, we also show whether the performance of the Baltic States (in 2014) in each factor differs significantly (at 5% significance) from the average values of other countries in the middle and high income level in 2014 and show the results in the same tables[9].

4.2.1. Macroeconomic environment

Income level

We witness that countries with lower GDP per capita levels are less likely to fall into trap even when controlling for other factors. Impact is significant in almost all of our group regressions including our main MIT prediction model. These findings for GDP per capita impact on MIT likelihood are in line with vast evidence that has been found for conditional β-convergence throughout different research approaches (Islam, 2003) (Quah, 1995) (Sala-i-Martin, 1996).

Moreover, we find that higher income level relative to country's trading partners has a positive and significant impact on the probability of MIT when it is included in main regression specification. Similar conclusion was reached by Arora and Vamvakidis (2005). Hence, even though literature on convergence indicates that globally there could be absolute divergence (Sala-i-Martin, 1996), trading intensively with wealthy economies can help economy to avoid the MIT.

Macroeconomic stability

We find that favourable macroeconomic environment characterized by low inflation, low standard deviation of inflation (our proxy for standard deviation of inflation is an Economic Freedom index which is high if the standard deviation of inflation is low), higher budget

[9] For some factors our dataset does not cover year of 2014; in that cases the latest available data is taken.

balance, monetary stability and lower price of capital has a significant and robust impact on decreasing the probability of being caught in MIT (Table 2). This finding is consistent with literature (Barro, 1996).

Economic structure

Higher investment rate has is significantly associated with lower probability of MIT and this factor is significant in 93% of our regression specifications (including the main regression model). We also find that higher government expenditure (% of GDP) increases the probability of getting trapped in all 100% regression specifications. These findings are consistent with that of Aiyar et.al. (2013). Regarding GDP structure on production side, we find that only share of agriculture has a significant and negative impact on the probability of MIT in most regression specifications. We find that industry as share of GDP is not significantly related to middle income trap probability in most of the regression specifications; however, the average share of industry as % of GDP in high and middle income countries is also not statistically significantly different (see Table 2).

Competitiveness

We find that higher compensation as a share of total costs and pay-and-productivity relation has a robust and significant impact on lowering the probability of MIT. Moreover, higher real effective exchange rate proves to have a significant impact on increasing the probability of MIT in about half of the regression specifications.

International trade and investments

Higher trade openness, lower trade barriers and tariffs have a robust and significant impact on decreasing the probability of MIT. Moreover, we find that large current account deficits are associated with higher MIT probability. Although, higher foreign direct investments have a significant effect on decreasing the probability of MIT in 87% of regression specifications (including the main model) (when used as an absolute value), when FDI is included in the main regression model as a relative value it proves to be significant with increasing the probability of MIT. Notably, many trade openness proxies (freedom to trade internationally

index and exports as % of GDP) turn out to be more significant when they are included in the regressions as relative values reflecting rise of global trade over time.

Table 2 Impact of Macroeconomic Environment on MIT

		ABSOLUTE			RELATIVE												
		Impact on MIT	Signif. % of all reg.	Signif. in the main model	Impact on MIT	Signif. % of all reg.	Signif. in the main model	EE vs HIC	EE vs MIC	LV vs HIC	LV vs MIC	LT vs HIC	LT vs MIC	HIC vs MIC	HIC mean	MIC mean	# of obs.
Macroeconomic Environment	Government (% of GDP)	+	100%	Yes	-	27%		-	H	-	-	-	-	-	18.53	16.43	2031
	Investment (% of GDP)	-	93%	Yes	+	27%		H	H	-	-	-	-	-	21.74	23.19	1987
	Agriculture (% of GDP)	-	7%		-	67%	Yes	H	L	H	L	H	L	L	1.53	5.93	1537
	Trade openness	-	100%	Yes	-	100%	Yes	-	H	-	-	-	H	-	125.39	87.08	2147
	Regulatory trade barriers * (see description)	-	100%	Yes	-	80%	Yes	-	H	-	H	L	-	H	7.67	6.69	830
	Tariffs*	-	73%	Yes	-	67%		-	-	-	-	-	-	-	7.77	7.70	1712
	Imports (% of GDP)	-	73%		-	33%		-	H	-	H	-	H	-	64.46	47.49	2033
	Compensation of employees (% of expense)	-	93%		-	40%		-	-	-	L	-	L	-	16.45	22.60	871
	Pay and productivity	-	100%	Yes	-	87%		H	H	-	H	-	H	H	4.31	3.87	419
	Freedom to trade internationally	-	67%		-	100%	Yes	-	H	-	H	-	-	H	7.87	7.26	1714
	Mean tariff rate (%)	+	67%		+	87%	Yes	-	L	-	L	-	L	-	2.81	5.46	1116
	Exports (% of GDP)	-	60%		-	100%	Yes	-	H	-	H	-	H	-	72.62	45.89	2033
	Price level of imports	+	40%		+	87%		-	-	-	-	L	-	-	0.89	0.85	2097
	Current account balance	-	29%	Yes	+	40%		-	-	-	-	-	-	H	2.90	-2.67	1531
	Price level of exports	+	7%		+	67%		-	-	-	-	-	-	-	0.90	0.93	2097
	Inflation	+	100%	Yes	+	73%		-	-	-	-	-	-	L	2.14	5.32	1851
	Government budget balance (% of GDP)	-	87%		+	47%		-	H	-	H	L	L	-	-0.44	-3.07	857
	Price level of capital stock	+	86%		+	80%		L	-	L	-	L	-	H	1.24	0.91	2097
	Foreign direct investment, net inflows (% of GDP)	-	86%	Yes	+	27%	Yes	-	-	-	-	-	-	-	8.55	4.28	1738
	Macroeconomic environment	-	73%		-	60%		-	H	-	-	-	-	-	5.24	4.79	419
	Standard deviation of inflation * (see description)	-	73%	Yes	-	40%		-	-	L	L	-	-	-	9.20	8.71	1761
	Access to Sound Money	-	67%	Yes	-	47%	Yes	-	-	-	-	-	-	H	9.25	8.59	1772
	Interest rate spread (%)	+	67%	Yes	-	27%	Yes	-	-	H	-	-	-	-	2.85	5.43	1367
	Money growth	-	60%	Yes	+	20%	Yes	L	L	-	-	L	-	-	9.12	8.92	1717
	Employment of population (%)	+	47%	Yes	+	100%	Yes	-	H	L	-	L	-	H	0.51	0.42	2077
	Region GDP growth	-	53%		Insignif.	0%		-	L	-	L	-	L	-	0.00	0.01	2154
	Real effective exchange rate	+	40%		+	60%		-	-	-	-	H	-	-	101.42	108.00	2097
	Income level relative to trading partners	+	21%	Yes	+	7%	Yes	L	-	L	-	L	-	H	1.53	0.57	2147

Created by authors. Result list includes variables with robust impact on MIT that have been either 1)significant in at least 50% of regression specifications with absolute value; 2)significant in at least 50% regression specifications with relative value; or 3)significant when controlled with the main MIT prediction model. Other findings and regression results available upon request.
EE=Estonia LV=Latvia LT=Lithuania MIC=middle income countries HIC=high income countries H=significantly higher L=significantly lower at 5% significance.
*This is an Economic Freedom subindex. Higher value of this subindex implies higher economic freedom with regard to the given factor, but lower value for the factor itself.

4.2.2. Development

We find that more extensive export diversification, higher tertiary education enrolment rates (and more educated labour force), better credit market regulations, higher technological and innovations advancement, higher economic freedom, lower income inequality, higher competitiveness (proxied by Global Competitiveness Index) and lower domestic credit levels decrease the probability of MIT (See Table 3).

Export diversification

Using data provided by the IMF on export diversification and extensive margin (proxies of how well country is diversified with regards to number of export products and trading partners) and Complexity index compiled by Hidalgo and Hausmann (Hausmann, Hidalgo, Bustos, Coscia, Simoes, Yildirim, 2014) that takes into account both export diversification

and product sophistication (awarding Japan with highest ECI in 2014) we find that more diversified and complex exports significantly decrease the probability of MIT (extensive margin is significant in all regressions both as absolute and relative value; export diversification is significant in 60% of the regressions as absolute values and in 75% of specifications – as a relative value). We find economic complexity to be significant in half of our regression specifications (when used as an absolute value); however, this factor was found insignificant when regressed together with extensive export diversification, leaving us with a conclusion that countries at middle income level should initially focus on trade diversification rather than specialization. We also test IMF's export quality index (high-tech products and manufactures as % of exports); however, we find these factors to be insignificant in almost all of our regression specifications. Export of manufactures, high-tech products, as well as "core" products such as metals and machinery are also found to be insignificant MIT determinants.

Human capital

Tertiary education enrolment rates are significant with a robust negative impact on the probability of MIT in all regression specifications, when included as an absolute value. Interestingly, contradictory to our assumption, relative value of tertiary education enrolment rate is insignificant in most regression specifications, suggesting that even if other countries have lower human capital, country cannot foster its development by not having a certain absolute level (of human capital). We find that secondary and primary education enrolment rates are insignificant in most regressions specifications; that can be explained by already very high enrolment rates (often close to 100%) in most middle income countries. Expenditure on education is found to have an increasing impact on the probability of MIT; we believe that such relation is observed because of this factors' high correlation with government size.

Income equality

GINI index is found to have a significant impact on increasing the probability of MIT in 93% of our regressions specifications (including in the main model) when used as an absolute value; however, also the relative value factor is significant when included in the main model; hence, we argue that income inequality causes a robust adverse effect on the probability of MIT.

Financial advancement

We find that higher availability of financial services (more than 80% of regression specifications and in the model as relative value) and more liberal credit market regulations (as measured by Economic Freedom of the World) decrease the probability of MIT. In turn, higher domestic credit is associated with higher probability of MIT. When controlling for other factors we do not identify a significant impact on probability of MIT caused by larger financial openness (proxied by Chinn-Ito Index (2015)). There is some evidence that higher market capitalization (% of GDP) is associated with lower probability of MIT (significant in half of the regressions specifications when used as a relative value).

Table 3 Impact of Social and Economic Development on MIT

		ABSOLUTE			RELATIVE											
		Impact on MIT	Signif. % of all reg.	Signif. in the main model	Impact on MIT	Signif. % of all reg.	Signif. in the main model	EE vs HIC	EE vs MIC	LV vs HIC	LV vs MIC	LT vs HIC	LT vs MIC	HIC vs MIC	HIC mean	MIC mean	# of obs.
Social and Economic Development	Extensive trade diversification	+	100%	Yes	+	100%	Yes	-	L	-	L	-	L	-	0.12	0.26	2149
	Domestic credit by financial sector (% of GDP)	+	93%		+	100%	Yes	L	L	L	-	L	L	H	171.98	72.50	420
	Education expenditure (% of GDP)	+	93%	Yes	+	80%		-	-	-	-	-	-	-	5.46	5.14	1575
	Government exp. on education (% of GDP)	+	93%	Yes	+	73%		-	-	-	-	-	-	-	5.46	5.14	1575
	GINI index	+	93%	Yes	+	40%	Yes	-	L	H	-	H	-	L	31.06	39.17	1022
	Enrolment in tertiary education	-	93%	Yes	-	13%		-	H	-	-	-	H	-	69	58	1760
	Prevalence of foreign ownership	-	87%	Yes	-	93%	Yes	-	H	-	-	L	-	H	5.38	4.65	419
	Availability of financial services	-	85%		-	93%	Yes	L	H	L	-	L	-	H	5.73	4.65	270
	Domestic credit to private sector	+	80%		+	93%	Yes	L	L	-	-	L	L	H	132.58	59.43	420
	Credit market regulations* (see description)	-	80%		-	71%		H	H	-	H	-	H	H	9.05	8.35	1751
	GDP per capita	+	80%	Yes	-	53%	Yes	L	-	L	-	L	-	H	42612	14454	2154
	Technological adoption	-	75%		-	7%		L	H	L	-	L	H	H	5.74	4.84	270
	PCT patents, applications/million pop	-	73%		-	80%		L	-	L	-	L	-	H	153.79	17.06	184
	Innovation and business sophistication	-	73%		-	60%		L	H	L	-	L	-	H	5.15	3.72	380
	Economic Freedom Index	-	73%		-	60%	Yes	-	H	-	-	-	H	H	7.70	6.96	1661
	Self-employed (% of total employed)	-	73%		-	53%		-	L	-	L	-	L	L	11.44	27.19	1165
	Health expenditure (% of GDP)	+	67%	Yes	+	87%	Yes	L	L	L	L	L	-	H	9.74	7.01	1004
	Export diversification	+	64%		+	80%		-	L	-	L	-	L	-	2.38	2.71	2149
	Global Competitiveness Index	-	57%		Insignif.	0%		L	H	L	-	L	-	H	5.29	4.30	380
	Economic Complexity Index	-	53%		-	20%		-	H	L	-	-	-	H	1.29	0.39	1912
	Total Factor Productivity	-	53%		-	7%		L	-	L	-	L	-	H	0.96	0.66	1912
	Researchers in R&D (per million people)	+	53%		+	7%		L	H	L	-	L	H	H	4718	1714	744
	Labor force with tertiary education (% of total)	-	53%		Insignif.	0%		-	H	-	H	-	H	H	35	25	901
	Quality of overall infrastructure	+	33%	Yes	+	100%	Yes	L	H	L	-	L	H	H	5.96	4.42	419
	Urban population (% of total)	-	27%	Yes	Insignif.	0%		L	-	L	-	L	-	H	85.02	69.23	2154
	Ease of access to loans	-	13%		-	60%	Yes	-	-	L	-	L	L	H	3.59	2.79	419
	Population growth	+	7%		+	47%	Yes	L	L	L	L	L	L	-	0.01	0.01	2097
	Market capitalization to GDP	Insignif.	0%		-	53%		-	L	-	L	-	L	-	142.17	42.66	1020

Created by authors. Result list includes variables with robust impact on MIT that have been either 1)significant in at least 50% of regression specifications with absolute value; 2)significant in at least 50% regression specifications with relative value; or 3)significant when controlled with the main MIT prediction model. Other findings and regression results available upon request.
EE=Estonia LV=Latvia LT=Lithuania MIC=middle income countries HIC=high income countries H=significantly higher L=significantly lower at 5% significance.
*This is an Economic Freedom subindex. Higher value of this subindex implies higher economic freedom with regard to the given factor, but lower value for the factor itself.

4.2.3. Governance

We find that (1) public sector's efficiency and accountability (less corruption, less wastefulness of funds, increased policy coordination, stronger public institutions), (2) lower government regulation, (3) higher social participation and civil rights (voice and accountability, political and social integration), and (4) more reliable judicial system (rule of

law, stronger property rights, efficiency of settling disputes) have robust and significant impact on decreasing the probability of MIT (see Table 4).

Quality of public institutions, government efficiency, resource efficiency and wastefulness of government spending have all been found to have a significant impact on the probability of MIT in most regression specifications including the main model (either as absolute or relative value).

We find higher control of corruption and improved anti-corruption policy to have a robust and significant impact in decreasing the probability of MIT, as these factors are significant also when included in the main regressions model.

We find that in order to avoid MIT, country should achieve higher economic freedom (measured by Economic Freedom Index), have less (but more efficient) regulations and less obstacles for starting business. Luckily, Baltics are performing significantly better than other middle income countries on average in terms of business regulations, ease of doing business and especially - wage flexibility.

Our findings suggest that tax policy can have a significant impact on the probability of MIT. Direct taxation (specifically top marginal tax and tax on income, profits and capital gains) increase MIT probability, while higher taxation of goods and services decrease it.

Table 4 Impact of Governance on MIT

		ABSOLUTE			RELATIVE										
		Impact on MIT	Signif. % of all reg.	Signif. in the main model	Impact on MIT	Signif. % of all reg.	Signif. in the main model	EE vs HIC	EE vs MIC	LV vs HIC	LV vs MIC	LT vs HIC	LT vs MIC	HIC vs MIC	HIC mean	MIC mean	# of obs.
Governance	Cooperation in labor-employer relations	-	100%	Yes	-	100%	Yes	-	H	L	H	L	-	H	5.24	4.20	419
	Diversion of public funds	-	100%	Yes	-	100%	Yes	L	H	L	-	L	-	H	5.59	3.35	419
	Wastefulness of government spending	-	100%	Yes	-	100%	Yes	-	H	L	-	L	-	H	4.17	3.01	419
	Burden of government regulation	-	100%	Yes	-	100%	Yes	-	H	-	-	L	-	H	3.74	3.11	419
	Voice and accountability	-	100%	Yes	-	100%	Yes	-	H	-	H	-	H	H	1.15	0.25	973
	Government efficiency	-	100%	Yes	-	93%	Yes	-	H	L	-	L	-	H	4.58	3.43	419
	Control of corruption	-	100%	Yes	-	67%		L	H	L	-	L	-	H	1.76	0.06	973
	Legal system & property rights	-	93%	Yes	-	100%	Yes	L	H	L	H	L	H	H	7.88	5.60	1627
	Government effectiveness	-	93%		-	93%		L	H	L	H	L	H	H	1.64	0.30	973
	Resource efficiency	-	93%		-	87%	Yes	-	H	-	-	-	H	-	8.31	5.99	389
	Protection of property rights	-	93%	Yes	-	60%		L	H	L	-	L	-	H	8.03	5.30	826
	Market Economy Status Index	-	100%	Yes	-	47%		-	H	-	H	-	H	H	8.45	7.04	389
	Ethical behavior of firms	-	93%		-	100%	Yes	L	H	L	-	L	-	H	5.88	4.02	419
	Corporate ethics	-	93%		-	100%	Yes	L	H	L	-	L	-	H	5.88	4.02	419
	Institutions	-	93%		-	100%	Yes	L	H	L	-	L	-	H	5.40	3.92	419
	Ethics and corruption	-	93%	Yes	-	20%		L	H	L	-	L	-	H	5.38	3.40	419
	Efficiency of legal framework in settling disputes	-	92%	Yes	-	86%	Yes	L	H	L	L	L	-	H	5.16	3.52	308
	Effect of taxation on incentives to invest	-	91%		-	67%	Yes	-	H	-	-	L	-	H	4.23	3.54	142
	Anti-corruption policy	-	87%		-	87%	Yes	-	H	-	-	-	H	-	7.81	5.54	389
	Rule of law (WGI)	-	93%		-	87%		L	H	L	H	L	H	H	1.60	0.13	973
	Efficienct use of talent	-	93%		-	80%	Yes	-	H	L	H	L	H	H	5.06	3.98	419
	Judicial independence (WEF)	-	80%		-	100%	Yes	-	H	L	-	L	-	H	5.88	3.80	419
	Black market exchange rates* (see description below)	-	87%		-	93%	Yes	-	-	-	-	-	-	H	132.58	59.43	1776
	Policy coordination	-	80%	Yes	-	40%		-	H	L	-	-	H	H	9.44	6.50	389
	Political and social integration	-	86%		-	73%		-	H	-	-	-	H	-	4.35	6.48	389
	Sustainability	-	86%		-	13%		-	H	-	H	-	H	-	7.88	6.32	389
	Welfare regime	-	85%		-	60%		H	H	-	H	-	H	H	7.91	6.71	389
	Civil rights	-	80%		-	87%	Yes	H	H	H	H	H	H	-	5.38	6.98	389
	Accountability	-	73%	Yes	-	80%	Yes	L	H	L	-	L	-	H	5.21	4.46	419
	No. of days to start a business	-	80%		-	20%		-	-	-	-	H	-	-	10.84	29.95	401
	Organization of the market and competition	-	79%		-	73%		-	H	-	H	-	H	-	8.63	7.55	389
	Public institutions	-	67%	Yes	-	80%	Yes	L	H	L	-	L	-	H	5.36	3.81	419
	Flexibility of wage determination	-	73%		-	73%	Yes	H	H	H	H	H	H	-	4.50	4.80	419
	BTI Status Index (democracy and market liberalism)	-	73%		-	47%		H	H	-	H	H	H	-	6.58	7.12	389
	Rule of law (BTI)	-	67%		-	60%		H	H	-	H	H	H	-	5.05	6.59	389
	Social capital	-	67%		-	27%		H	H	-	-	H	H	-	5.44	6.30	389
	Regulation* (see description)	-	67%		-	47%	Yes	-	H	-	H	-	H	H	7.80	6.91	1614
	Country capacity to retain talent	-	64%		-	20%		L	-	L	-	L	L	H	4.83	3.27	142
	Irregular payments and bribes	-	54%		-	13%		L	H	L	-	L	-	H	6.03	4.18	270
	Taxes on goods and services (% of revenue)	-	60%		-	7%		-	H	-	-	-	-	-	27.34	32.89	855
	Stateness (BTI)	-	57%		+	13%		-	H	-	H	-	H	-	9.03	8.65	389
	Regulatory Quality	-	53%		-	33%		-	H	L	H	L	H	H	1.50	0.30	973
	Country capacity to attract talent	-	54%		-	27%	Yes	L	-	L	L	L	L	H	4.73	3.17	142
	Judicial independence (EF)	-	47%	Yes	Insignif.	0%		-	H	L	-	L	-	H	8.14	4.54	821
	Taxes on income, profits and capital gains (% of revenue)	+	27%	Yes	+	33%	Yes	L	L	L	L	L	L	-	31.47	22.42	862
	Steering capability	-	33%	Yes	-	20%		H	H	H	H	H	H	L	5.00	6.47	389
	Undue influence	-	20%		-	87%	Yes	-	H	L	-	L	-	H	5.20	3.39	419
	Top marginal tax rate* (see description)	+	20%	Yes	+	87%	Yes	-	-	-	-	-	-	-	5.23	6.37	1516
	Labor market regulations* (see description)	+	20%	Yes	+	80%	Yes	-	-	-	-	-	H	H	7.31	6.27	1070
	Impartial courts	-	20%		-	27%	Yes	L	H	L	-	L	-	H	6.63	3.93	933
	Resolving insolvency	Insignif.	0%		+	80%	Yes	L	-	L	-	L	-	H	81.18	48.99	479

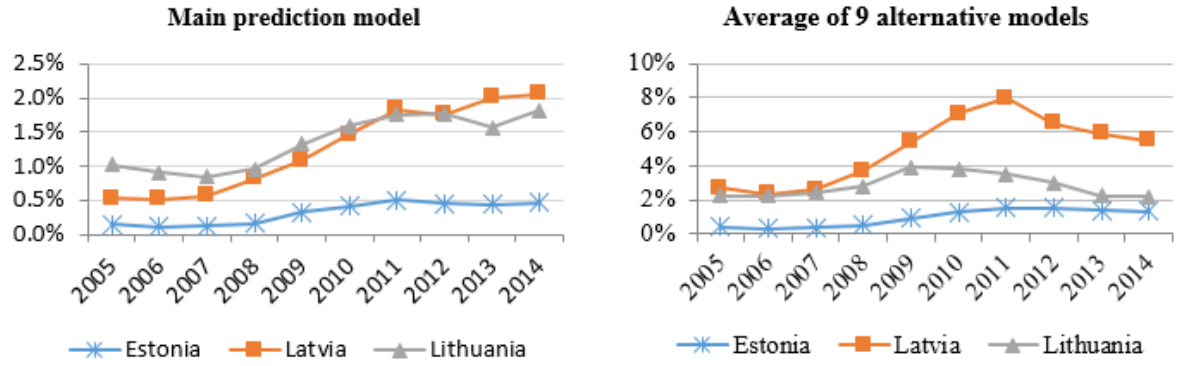
Created by authors. Result list includes variables with robust impact on MIT that have been either 1)significant in at least 50% of regression specifications with absolute value; 2)significant in at least 50% regression specifications with relative value; or 3)significant when controlled with the main MIT prediction model. Other findings and regression results available upon request.
EE=Estonia LV=Latvia LT=Lithuania MIC=middle income countries HIC=high income countries H=significantly higher L=significantly lower at 5% significance.
*This is an Economic Freedom subindex. Higher value of this subindex implies higher economic freedom with regard to the given factor, but lower value for the factor itself.

4.3. MIT predictions for Baltics

As a result of stepwise selection including hundreds of variables and thousands of regressions, we have constructed a highly significant MIT prediction model with mean predicted probability of 59% for trapped observations and 20% for non-trapped observations covering the period of 1977-2014 with 1143 overlapping observations (345 traps) from 53 middle-income countries (Model 1 in Appendix C).

For trade openness, extensive trade diversification and economic freedom sub-indices (legal system & property rights, freedom to trade internationally, and credit market regulations) to improve precision of the model. Higher predictive power of these factors as relative rather

Figure 4 Estimated MIT probabilities for Baltics using the prediction models



Created by authors.

than absolute is explainable by substantial growth in all these factors over time due to trade liberalization and enlarged economic freedom. As MIT appears to be more associated with how the observed economy is performing relatively to the benchmark in that year, using absolute values in this case do not yield as precise predictions. However, in the alternative prediction models, we substitute some relative value variables with absolute (or vice versa) to test the robustness. Moreover, the 8 alternative prediction models include a variety of factors that have shown significant impact on MIT but where not included in the main prediction model (Appendix C).

Results of all our prediction models (see Table 5) are consistent – MIT probability in Baltics is currently rather low. Only period when there has been a risk of getting stuck in MIT for Baltics was early 1990s after collapse of USSR with Estonia actually identified as trapped from 1991-1994. However, Estonia (and presumably also Latvia and Lithuania for which we have data only from 1994) escaped the trap with predicted probabilities sharply decreasing over time - 1992: 79.2%; 1993: 48.9%; 1994: 20.1%; 1995: 5.4%. Although MIT predictions

have somewhat worsened since 2007 (see Figure 4), probabilities for Baltic countries remain low in 2014 (Estonia: 0.46%, Latvia: 2.1%, Lithuania: 1.8%) compared to mean prediction for middle-income countries (31.6%). To verify that low MIT predictions are not caused by having too wide selection of countries in our dataset, we test robustness using more narrow income range (30%-50% of US). Findings are consistent as MIT predictions for Baltics remain at very low level (results available upon request).

Table 5 MIT prediction results with different model specifications (Model 1=the main prediction model)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
# variables	***14***	*8*	*12*	*12*	*9*	*11*	*7*	*10*	*9*
Estonia	**0.46%**	4.00%	0.92%	0.85%	2.81%	*0.00%*	1.22%	1.00%	0.74%
Latvia	**2.06%**	6.02%	4.50%	4.37%	8.31%	0.09%	2.56%	13.06%	8.41%
Lithuania	**1.82%**	4.71%	1.66%	2.49%	4.23%	0.00%	2.15%	1.77%	0.76%
Mean prediction for trapped obs.	**58.68%**	43.63%	51.32%	54.61%	42.14%	54.09%	37.26%	41.71%	39.63%
Mean prediction	**31.63%**	28.90%	29.52%	30.21%	26.47%	20.83%	22.19%	20.31%	19.54%
Mean prediction for non-trapped obs.	**20.03%**	22.77%	20.30%	20.13%	19.99%	10.62%	16.86%	13.82%	13.67%
# observations	**1143**	1420	1078	1096	1564	471	768	583	578
# traps	**345**	419	322	322	459	112	202	137	132
# countries	**53**	60	49	50	61	35	53	42	41
Beginning of period (year)	**1977**	1967	1977	1977	1967	1993	1993	1993	1993
Chi2	**132.05**	139.66	113.47	117.18	154.64	37.03	56	39.21	34.59

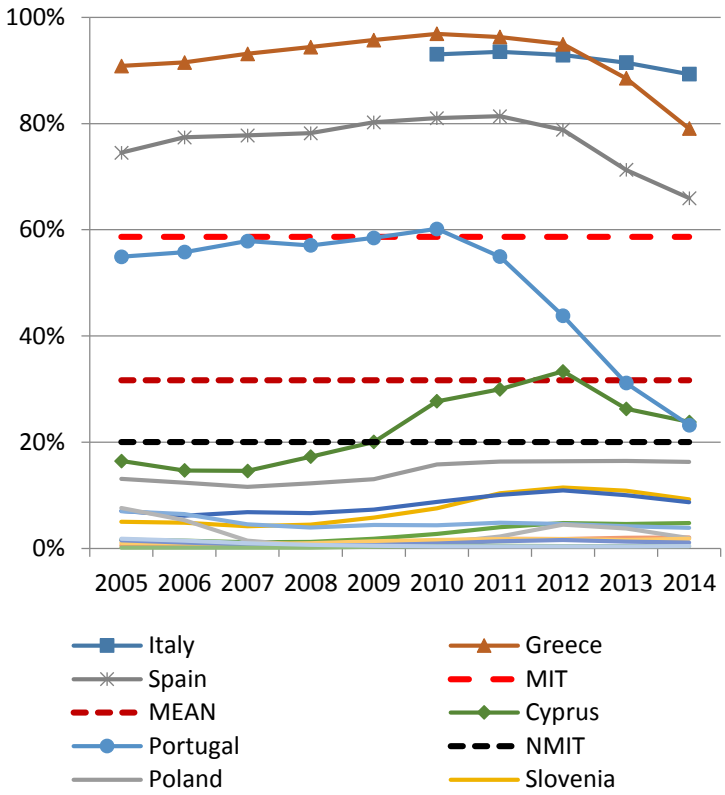
Created by the authors.

Table 6 Predicted MIT probabilities for Europe

Country	MIT prob.
Italy	89.30%
Greece	79.06%
Spain	65.95%
Cyprus	23.82%
Portugal	23.20%
Poland	16.26%
Slovenia	9.23%
Croatia	8.67%
Slovakia	4.77%
Czech Republic	3.85%
Latvia	**2.06%**
Hungary	1.96%
Lithuania	**1.82%**
Bulgaria	1.12%
Estonia	**0.46%**
Romania	0.45%

Created by the authors.

Figure 5 Predicted MIT probabilities for Europe (2005-2014)



Created by the authors.

Italy, Greece, Spain, Cyprus and Portugal have the highest predicted MIT probabilities in Europe (see Table 6) and are all identified as trapped (see Appendix B). Interestingly, our prediction model would have indicated structural problems in these countries long before the breakout of the European debt crisis (Figure 5). Structural reforms addressing poor governance that followed bailout and intervention by IMF have lowered MIT probabilities in Greece and significantly improved situation in Portugal (drop in MIT probability from 60.2% in 2010 to 23.3% in 2014).

Meanwhile, Italy that has faced income divergence from wealthier European countries and USA (and has fallen back to middle-income in 2010) has not been able to enforce structural reforms and remains trapped with a small decline in prediction caused by decreasing GDP per capita and income relative to trading partners. However, severe problems such as decreasing enrolment in tertiary education, low and declining investment as % of GDP together with rather high price level of capital and very low FDI net inflows are the actual causes behind such high MIT prediction. Italy is an intriguing example, because it shows that the problem is not merely about the middle income level and Baltic countries will have to keep up with reforms and stay competitive also after reaching high-income.

Appendix F shows what have been the MIT predictions since 1977; and it is clearly noticeable that predicted MIT probabilities in Europe are currently relatively low compared to the rest of the world.

5. Discussion of Results

Analysis of results provided the reader with an answer to our first research question by clearly outlining all observations of MITs historically and currently; as well as some characteristics and frequency of MIT. In this section we move on to discuss how stable are the predicted probabilities for Baltic countries facing the MIT, whether the Baltic economies can be considered to be trapped according to other researchers' offered MIT definitions and which factors we consider to be possessing the highest risks specifically for the Baltics.

5.1 Predicted probability for the Baltic States

We test the sensitivity of MIT predictions for Baltic economies by adjusting variables that we consider to be possible to influence by government policies. In positive development scenario "HIC" these factors are raised to the level of high-income countries. In negative scenario "MIC" we equalize all adjustable factors with an average level of middle-income countries. Besides providing us with additional robustness check for MIT predictions, it also allows us to analyse the impact of potential catch up or degeneration caused by unsuccessful policies as well as identify factors with largest impact on Baltic economies. When making adjustments, we assume that policy makers have a direct influence over quality of institutions, business environment, tax policy, as well as enrolment rates in tertiary education (e.g. by providing free higher education and equal opportunity for everyone to continue their studies through scholarships). At the same time, we believe that Baltic governments do not have direct influence over inflation (mostly affected by ECB), tariffs, trade openness (being part of EU and WTO), price level of capital stock, export diversification, and external factors such as current account balance, GDP per capita and relative trading partners' wealth. Full list of variables that we adjust and the extent of adjustment are reported in Appendix G. As can be noted, negative adjustments in scenario "MIC" are substantial (considerably larger than positive adjustments in scenario "HIC") as all Baltic economies are currently much better positioned with regard to these factors when compared to typical middle-income country.

In scenario "HIC", results indicate that Estonia would not benefit from catching-up with high-income countries (in certain factors) as much as Latvia and Lithuania, reflecting already better institutions in Estonia (see Appendix H), however, it is more sensitive to "MIC" scenario - on average the MIT probability for Estonia increases from 1.3% to 6.8%; whereas,

for Lithuania - from 2.2% to 5.2%. Nevertheless, it is still much below the mean predicted probability of non-trapped observations under all model specifications.

Although deterioration of factors affected by government policies result with higher MIT probabilities, the predictions for Baltics still remain very low (in the main model EE: 2.7%, LV: 4%, LT: 3.4%) in comparison to mean prediction for actually trapped economies (58.7% in the main model, 47% on average). Nonetheless, in some specifications MIT probability increase can be substantial (e.g. from 8.4% to 25.7% for Latvia in Model 9).

After examining the underlying values of each factor for the Baltics and taking into account which variables are always kept unchanged, we identify that MIT predictions for Baltic economies are most exposed to changes in governance indicators (control of corruption, government effectiveness, voice and accountability), income inequality, and legal system and property rights. Moreover, we find that Latvia can reduce its highest predicted MIT probability in Model 8 from 13.1% to 1.6% by reducing income inequality and corruption to the mean level of high-income countries (GINI index from 35.6 to 31.1 and control of corruption index from 0.2 to 1.8 (this index has values ranging from -2.5 to 2.5)).

After performing a robustness check by comparing MIT predictions for Baltics with other European countries, using 8 alternative models covering different economic factors and time periods (starting from 1967, 1977 or 1993 - depending on data availability), and adjusting factors that can be affected by policy makers accordingly to a positive and a negative development scenario, we conclude that there is robust evidence that none of the Baltic countries is currently threatened by MIT. All Baltic economies are fundamentally in much healthier condition than it would be expected from a typical middle-income country (and current economic growth of the Baltic States ascertains that). However, MIT probabilities can be further decreased by decreasing corruption (especially in Latvia), income inequality and improving institutions (particularly public institutions in Latvia and Lithuania). Provided that economic policy makers make no drastic reversals and consider following proposed recommendations, we expect to see further convergence with the EU average income levels.

5.2. Performance of the Baltics in the context of previous literature MIT definitions

We have provided our argumentation for why in our opinion none of the existing MIT definitions in the literature have the potential to successfully identify middle income traps.

However, for the benefit of the reader, we look at whether the existing definitions identify any of the Baltic States to be trapped[10].

Firstly, we must acknowledge that according to the middle income level classifications offered by the World Bank, Aiyar et.al. (2012) and Robertson et.al. (2013) all three Baltic States have already graduated from the middle income level and are now (as of 2014) classified as high income countries (upper thresholds of middle income level proposed by these sources are - 12,736$ (GNI per capita at 2014$), 15,000$ (GDP per capita at PPP 2005$) and 8-36% of the USA's GDP per capita at PPP respectively[11]. Hence, according to these authors, Baltics have already avoided the MIT. (Except, in 2014 Latvia was still at 35% of the USA's income level).

GDP per capita data for the Baltics is only available since 1993 (for Estonia – since 1990)[12], when they *entered* the dataset as middle income countries already. Hence, we do not know exactly how long Baltics have been at middle income level, and we cannot compare their time spent as middle income countries to the benchmarks offered by Felipe et.al. (2012), who argued that if country's income level is between 2,988$ and 17,557$ (2005$ at PPP) for longer than 42 years, the country is trapped. However, he specified that there is also "upper MIT", where country is trapped if its income level is between 10,833$ and 17,557$ for longer than 14 years. Both, Estonia and Lithuania was at this income level for 12 years before *graduating* in 2011 and 2014 respectively. However, according to Felipe et.al. (2012) Latvia still must grow with at least 3.5% per year in order to avoid the "upper MIT", which apart from years 2008-2010 it has achieved.

Robertson et.al (2013) conditions that a country is trapped if in the long term the difference between certain country's log income and the USA log income is stationary. As long as the data is available, this is not the case for the Baltics, because since 1994, GDP per capita of Estonia, Latvia and Lithuania relatively to the USA has gradually increased by around 25, 17 and 18 pp respectively.

Lastly, Eichengreen et.al. (2014) defines MIT as the moment when historical 7-year (t-7) average growth has been considerably higher (by at least 2 pp) than future 7-year (t+7)

[10] None of the existing papers have identified any of the Baltic States to be in the MIT; however, they have not used GDP per capita data until 2014 and some of the papers exclude the Baltics from their data sample.
[11] All GDP per capita figures for estimates are acquired from Penn World Tables 7.1 database until 2010, and extrapolated till 2014 using the GDP per capita at PPP growth rates from the World Bank WDI database.
[12] Penn World Tables 7.1 database.

growth rate (conditioning that country's 7-year average (t-7) growth before was at least 3.5% p.a. According to Eichengreen et.al., all three Baltic States were trapped between 2002 and 2007 (Lithuania – since 2003) (we cannot say anything about the situation after 2007 because we need to know growth rates from 2015 onwards to calculate future (t+7) average growth rate). Such proposition is rather controversial, because firstly, it is hard to comprehend why should economies be considered to be trapped when they are still growing more than 7% p.a., as was the case in the Baltics between 2002 and 2007; and secondly, since 2010 the 7-year historical average growth of Baltics economies has been below 3.5%; hence, according to Eichengreen et.al. (2014) they cannot classify to be experiencing MIT. To our mind, the case of the Baltics ascertains that Eichengreen et.al. (2014) definition is flawed.

To sum up, none of the existing MIT definitions clearly suggest that the Baltics are caught in the MIT as of 2014.

5.3. Discussion of key determinants of MIT: relevance for the Baltics

5.3.1. Income level

Joining the EU catalysed the development of Baltic countries by larger capital inflow, *import* of innovations and crucially - implementation of institutional and economic reforms (e.g. in order to fulfil the Copenhagen criteria) (Kasjanovs and Meļihovs, 2011). Baltic countries have caught up with their trading partners significantly since 2000 (Lithuania and Estonia from around 45% to almost 70%; and Latvia from around 34% to 62% in 2014 (authors' estimates based on IMF DOTS). This development might be attributed to club convergence (Islam, 2003). Kasjanovs (2015) has speculated that Latvia may fall into MIT in the medium term upon reaching approximately 75% of the EU average. We test this hypothesis with our main prediction model by virtually increasing GDP per capita of Latvia by 25%, and the income level relative to its trading partners' to 75%. The estimated probability for Latvia in such case is 5.4%. An increase from 2.1% to 5.4% is considerable; however, it is still relatively small compared to other middle income countries. Nevertheless, it also indicates that as the Baltic economies grow, the probability of getting trapped will increase inevitably, and the only way how policy makers can avoid increasing probability of getting trapped is by improving factors that they can influence with consistent structural reforms.

5.3.2. Macro stability

We have found macroeconomic stability to have a significant and robust effect on decreasing the probability of MIT. Price stability is necessary especially for middle income countries for easier attraction of investments to improve productivity and reach high-income level (Sala-i-

Martin, 1997) (Fischer, 1993). Moreover, price stability is also closely associated with the price level of capital stock, that must be maintained low to assure a more favourable environment for investments.

Furthermore, unsustainably high budget deficits have caused several EU countries to face prolonged debt crisis; moreover, Fischer (1993) suggests that macroeconomic uncertainty caused by budget deficit has a negative impact on productivity growth (through lower efficiency of price mechanism) and adverse effect on investment rates. Fortunately, the Baltic States are among very few European countries to fulfil the Maastricht criteria and have a low budget deficit, and our findings recommend them to stay on this path.

5.3.3. Competitiveness

Baltic policy makers must keep a close eye on labour costs that have continued to increase steadily in the Baltic States since a drop in 2009. Relatedly, the compensation of employees as a share of GDP has increased by around 4.5 pp in Latvia and Estonia since 2013 (though still below the peak in 2008), which indicates that compensation is increasing more than productivity, and that has an adverse impact on competitiveness (Eurostat, 2015).

Losing competitiveness can turn out to be the prevailing factor for trapping the Baltic States, given that REER level in the Baltics has been recently increasing considerably faster than in most other EMU countries (Bruegel, 2015). Our finding on the effect of REER differs from Eichengreen et al. (2014) who argued that undervaluation makes countries less incentivized to initiate reforms for long term growth. However, we believe that high REER has an adverse impact on growth, as it implies lack of competitiveness and is associated with shrinking exports (Rodrik, 2008). After joining the EMU, the only way how Baltic countries can increase their competitiveness when trading with Eurozone is by a decrease in real factor prices or increase in productivity, as no currency adjustments are possible. When trading with countries outside Eurozone, currency rates may fluctuate, but it happens outside direct control of Baltic governments and central banks. Such situation has pushed several European countries (e.g. Portugal, Greece) into having overvalued currencies (De Grauwe, 2006), and as Eichengreen (2010) suggests, the Baltic countries might experience a similar scenario of large capital inflows and economic growth followed by overvalued currency and economic stagnation, in case they do not control their spending at all times.

Furthermore, Baltic States are significantly lagging behind high income countries in terms of innovations and business sophistication (as shown by Global Competitiveness Report).

However, we find related factors to have a significant impact on decreasing the probability of MIT. Moreover, literature suggests that innovations are particularly important for a country to advance to high income level and reach the "4th stage" of economic development, where country can lead innovations on global scale (Ohno, 2009). Unfortunately for Baltics, lack of innovation and business sophistication can jeopardize their transition to high income.

5.3.4. Economic structure

As mentioned, investment rate has one of the most significant and robust negative impact on the probability of MIT. Previous empirical economic growth research has provided rather strong results for relationship between investments share and GDP growth (De Long and Summers, 1991) (Sala-i-Martin, 1997). Investments are important for countries with a risk of being caught in the MIT, because shift from labour-intensive to more technology-intensive industries cannot happen without capital investments. Staehr (2015) has claimed that relatively large investment rates in the Baltics indicate that marginal returns of capital are still fairly high in this region. Nevertheless, investment rates can also be influenced by government policy actions (can be one of the reasons why Estonia has higher investment rates) e.g. by stronger rule of law, stable macroeconomic environment, tax incentives etc. Moreover, the significant and robust impact of government size on the probability of MIT suggests that improving the private sector activity at middle income level is more important and yields higher marginal returns than high government expenditure (Aiyar et.al. 2013). Estonia has been the leader in terms of both domestic and foreign direct investment activity in the Baltics, and that may be attributed to its outperformance in institutions, e.g. economic freedom. Notably, success of Finland, South Korea and Ireland was also chiefly driven by FDI (Foxley and Sossdorf, 2011), and hopefully soon enough we will be able to add (at least) Estonia to the list of countries that have escaped the MIT by attracting high-technology FDI.

5.3.5. Human capital

We find higher tertiary education enrolment to be consistently associated with lower MIT probability. This is in line with previous research as improved human capital has been emphasised as important factor to avoid MIT by various authors (Liu et al. 2013) (Egawa, 2013) (Staehr, 2015) (Agenor et.al, 2015). Kharas et.al. (2011) points out that development of tertiary education is one of the key differences between rapidly growing East Asia and *trapped* Latin America.

Availability and quality of tertiary education should be one of the key concerns for policy makers in the Baltics if they wish to avoid the MIT. Not only educated labour force is crucial

for innovations and higher productivity, but improved education availability may also decrease income inequality (which is one of the problematic factors for the Baltic States on its own) (Liu, Luo, Rozelle, Yi and Zhang, 2013) (Egawa, 2013).

Education has been a hot topic in the Baltics. While higher education enrolment rates are relatively high, the education quality is often challenged. IMF (2015) and OECD (2015) explain that Latvia and Lithuania still lack high-skilled workforce which is hard to obtain without improving the weak state of vocational education.

5.3.6. Income inequality

We find that income inequality has a significant and positive impact on the probability of MIT. Already the seminal papers on MIT identify the crucial role that middle class ought to play in middle income countries advancement to high income (Kharas et.al. 2011) (Berg et.al. 2012). They explain that growth in the domestic demand largely depends on the consumption of middle class, as countries cannot rely on ever increasing net exports.

Unfortunately, Latvia and Lithuania are among the most unequal countries in the EU, and OECD (2015) has explicitly pointed out that Latvia's and Lithuania's inequality problems can be a cause for further worsening skills mismatch, worse health of the society and generally less sustainable development. Hence, we would recommend Baltic policy makers to address this painful issue by e.g. reforming the educational system to decrease existing skill mismatches.

5.3.7. Public sector performance

Arguably, strong governance is one of the most important factors for avoiding the MIT because transition to high income requires decisive policy and structural reforms. South European countries (e.g. Italy) have shown that delaying reforms can even drag a high-income country back into middle income level. Baltic States have become notorious for structural reforms (drastic internal devaluation) pulled out during the crisis. However, implementing reforms during "peace times" when they can be targeted at maintaining long term growth, not fighting fire, comes harder; and weak governance may be one of the reasons.

Particularly Latvia and Lithuania are ranking rather poorly by the overall quality of their public institutions in the Global Competitiveness Report (Lithuania – 53rd, Latvia – 50th). Fish rots from its head, and metaphorically we see this as one of the key risks facing Lithuania and Latvia. Not only because weak institutions have an adverse impact on the

performance *today* (higher corruption, lower tax collection, worse investment environment, higher wastefulness of funds etc.) but chiefly because these countries can be trapped in a vicious cycle where lack of decisive structural reforms weakens the governance quality even further. Latvia and Lithuania rank 81st and 92nd respectively in terms of wastefulness of government spending, next to Tanzania, Cameroon and Russia. Overall public-sector performance is also at rather low levels – Latvia is ranked 74th and Lithuania – 76th. Delayed public healthcare and education system reforms in Latvia present the indecisiveness of government even in sectors that are harming society's well-being *today* (not even mentioning lack of long-term strategy). Such weak rankings in factors that we find to have a significant and robust impact on increasing the probability of MIT (e.g. wastefulness of spending) is even more alarming.

Moreover, our findings on legal system's impact on the probability of MIT are in line with previous literature claiming that property rights and rule of law fosters countries convergence with high income countries (Knack and Keefer, 1995). Improvements in judicial system require major structural reforms but Latvia and Lithuania are struggling. IMF (2015) recommends judiciary system reforms as one of the key structural changes for Latvia, as extremely long trials and stagnating insolvency process reform are some examples of how inefficient system undermine country's business environment and international image.

5.3.8. Corruption

Sadly, we must also discuss the dramatic impact that corruption in the Baltics can have on increasing the probability of MIT. As outlined previously, different corruption proxies are found to have a robust and significant impact on the MIT. Corruption can drag countries into the MIT by ruining the efficiency of resource allocation, ruining business environment and country's reputation in the eyes of international investors through unfair government tenders, corrupt CEOs of state owned enterprises, vested interests of political party sponsors and unfair court judgments. OECD's continuous indications at problems with Latvia's anti-corruption policies (being one of the reasons for not getting accepted at OECD) is a good example of how governance problems undermine country's prospects for development (OECD, 2015). Unfortunately, in almost all corruption proxies the Baltic countries are still significantly lagging behind high-income countries. It has been shown by previous researchers that weak public institutions are often the main cause for higher levels of corruption (Abed and Davoodi, 2000).

6. Conclusions

After seeing so many economists referring to the Baltic States in the context of possible middle income trap, we tested the appropriateness of such speculations. This paper has supplemented the existing literature in numerous ways. Firstly, we propose and apply our own definition of middle income trap which captures all characteristics of a *good* MIT definition by using country-specific benchmarks that successfully identify economic slowdowns that we believe can be characterized as middle income traps. By using the most extensive dataset that includes all factors that previous literature has mentioned to have a significant impact on the probability of middle income trap we, firstly, assess which factors have a significant and robust impact on the probability of MIT and, secondly, construct a multivariate panel data logit prediction model and quantitatively estimate the probability of each of the Baltic State to be facing middle income trap.

We answered three research questions:

1) *Which countries have historically been or currently are caught in the MIT?*

We find that 32% of middle income countries have historically been caught in a middle income trap, with the highest frequency of traps occurring in Latin America. None of the Baltic States are currently trapped; however, among European countries Italy, Greece, Cyprus, Portugal and Spain are currently trapped. Importantly, our model has shown increased MIT probabilities for these countries well before a trap has actually occurred.

2) *What is the current probability of Baltic countries facing the MIT and which Baltic country is most likely to get trapped?*

By employing numerous prediction models we find robust evidence that the probability of Baltic countries currently facing MIT is rather low (below 10%) when compared to global average. Moreover, we test our prediction models by adjusting some of the factor values for the Baltic States and see that no significant change in the predicted probability of MIT can be expected in the nearest future. Moreover, we find that the lowest probability of getting trapped exists for Estonia; whereas, the highest – for Latvia.

Additionally, we show that according to all MIT definitions offered in previous literature, Baltic countries cannot be considered to be in the MIT.

3)Which exogenous factors possess the highest risk for increasing the probability of MIT occurrence in the Baltic States?

We find that the recipe for avoiding middle income trap consists of strong public sector with abilities to implement structural reforms, low corruption, income equality, business friendly and free economy, strong institutions, sound macroeconomic environment with low inflation, advanced and equally available tertiary education, business-friendly regulations and taxation, highly sophisticated yet diversified exports, and economic structure with small government and large share of investments.

In addition to bringing attention to over 100 economic indicators that have significant impact over MIT likelihood; we have busted the myth of middle income trap in Baltics. Nevertheless, with increasing absolute income level and income level relatively to trading partners, the probability of Baltic States facing the trap will increase; hence, continuous structural reforms are necessary in order to maintain the MIT probability low also in the future.

7. Reference list

Abed, M. G. T., & Davoodi, M. H. R. (2000). Corruption, Structural Reforms, and Economic Performance in the Transition Economies (No. 0-132). *International Monetary Fund.*

Aiyar, M. S., Duval, M. R. A., Puy, M. D., Wu, M. Y., & Zhang, M. L. (2013). Growth slowdowns and the middle-income trap (No. 13-71). *International Monetary Fund.*

Arora, V., & Vamvakidis, A. (2005). How much do trading partners matter for economic growth? *IMF staff papers*, 24-40.

Aten, B., Heston, A., Summers, R., (2012) Penn World Table Version 7.1 Center for International Comparisons of Production, Income and Prices. *University of Pennsylvania.*

BBVA Research. (2015). Global Economic Outlook. First quarter 2015. Retrieved March 2, 2016, from https://www.bbvaresearch.com/wp-content/uploads/2015/02/Global_Economic_Outlook_1Q15-Cap3.pdf

Berg, A., Ostry, J. D., & Zettelmeyer, J. (2012). What makes growth sustained?. *Journal of Development Economics*, 98(2), 149-166.

Bursac, Z., Gauss, C. H., Williams, D. K., & Hosmer, D. W. (2008). Purposeful selection of variables in logistic regression. Source code for biology and medicine, 3(1), 1.

Bruegel. (2015). Real effective exchange rates for 178 countries: a new database [Data file]. Retrieved January 5, 2016, from http://bruegel.org/publications/datasets/real-effective-exchange-rates-for-178-countries-a-new-database/

Cimoli, M., & Correa, N. (2002). Trade openness and technological gaps in Latin America: a low growth trap. *Laboratory of Economics and Management Working Paper Series No14, Pisa.*

Cogley, T., & Nason, J. M. (1995). *Effects of the Hodrick-Prescott filter on trend and difference stationary time series Implications for business cycle research*. Journal of Economic Dynamics and control, 19(1), 253-278.

De Grauwe, P. (2006). What Have we Learnt about Monetary Integration since the Maastricht Treaty?*. *JCMS: Journal of Common Market Studies,44*(4), 711-730

De Long, J. B., & Summers, L. H. (1990). *Equipment investment and economic growth (No. w3515)*. National Bureau of Economic Research.

Durlauf, S. N., & Quah, D. T. (1999). The new empirics of economic growth. *Handbook of macroeconomics*, 1, 235-308.

Egawa, A. (2013). *Will income inequality cause a middle-income trap in Asia* (No. 797).

Eichengreen, B. (2010). The breakup of the euro area. In Europe and the Euro (pp. 11-51). University of Chicago Press.

Eichengreen, B., Park, D., & Shin, K. (2014). Growth slowdowns redux. *Japan and the World Economy, 32,* 65-84.

Eurostat Statistics Database. (n.d.). *Eurostat*. Retrieved 06.12.2015 from http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database

Felipe, J., Abdon, A., & Kumar, U. (2012). Tracking the middle-income trap: What is it, who is in it, and why?. *Levy Economics Institute, Working Paper,* (715).

Fischer, S. (1993). The role of macroeconomic factors in growth. *Journal of monetary economics, 32(3),* 485-512.

Foxley, A., & Sossdorf, F. (2011). *Making the transition: From middle-income to advanced economies.* Carnegie Endowment for International Peace.

Gill, I. S., Kharas, H. J., & Bhattasali, D. (2007). An East Asian renaissance: ideas for economic growth. World Bank Publications.

Gwartney, J., Lawson, R., & Hall, J. (2015). *Economic freedom of the world 2015 annual report.* The Fraser Institute.

Han, X., & Wei, S. J. (2015). Re-examining the Middle Income Trap Hypothesis: What to Reject and What to Revive?.

Hansen, M. (2013, July 23). *Of Latvian Growth and convergence* [Blog post]. Retrieved from http://www.ir.lv:889/2013/7/23/of-latvian-growth-and-convergence

Hausman, J., & McFadden, D. (1984). Specification tests for the multinomial logit model. Econometrica: *Journal of the Econometric Society*, 1219-1240.

Hausmann, R., & Klinger, B. (2006). Structural transformation and patterns of comparative advantage in the product space.

Hausmann, R., Hidalgo, C. A., Bustos, S., Coscia, M., Simoes, A., & Yildirim, M. A. (2014). *The atlas of economic complexity: Mapping paths to prosperity*. Mit Press.

Hausmann, R., Pritchett, L., & Rodrik, D. (2005). Growth accelerations. *Journal of Economic Growth, 10*(4), 303-329.

Hoetker, G. (2007). The use of logit and probit models in strategic management research: Critical issues. *Strategic Management Journal, 28*(4), 331-343.

Hosmer Jr, D. W., Lemeshow, S., & Sturdivant, R. X. (2000). Model-building strategies and methods for logistic regression. *Applied Logistic Regression, Third Edition*, 89-151.’

International Monetary Fund. (2014) "Sustaining Long-Run Growth and Macroeconomic Stability in Low-Income Countries: The Role of Structural Transformation and Diversification." *IMF Policy Paper*, Washington, March.

International Monetary Fund. (2015). *Republic of Latvia : Staff Report for the 2015 Article IV Consultation*. Washington, D.C.

International Monetary Fund. (2015). Republic of Latvia: Selected Issues. Retrieved from http://www.imf.org/external/pubs/ft/scr/2015/cr15111.pdf

Islam, N. (1995). Growth empirics: a panel data approach. *The Quarterly Journal of Economics*, 1127-1170.

Islam, N. (2003). What have we learnt from the convergence debate?. *Journal of economic surveys*, *17*(3), 309-362.

Kasjanovs, I. (2015). Is part of the Latvian economy already in the middle-income trap?. *World Economics*, *16*(1), 58-69.

Kharas, H., & Kohli, H. (2011). What is the middle income trap, why do countries fall into it, and how can it be avoided?. *Global Journal of Emerging Market Economies*, *3*(3), 281-289.

Knack, S., & Keefer, P. (1995). Institutions and economic performance: Cross-country tests using alternative institutional indicators.

Levine, R. (2001). International financial liberalization and economic growth.*Review of international Economics*, *9*(4), 688-702.

Levine, R., & Renelt, D. (1991). *Cross-country studies of growth and policy: methodological, conceptual, and statistical problems* (Vol. 608). World Bank Publications.

Levine, R., & Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. *The American economic review*, 942-963.

Levine, R., & Zervos, S. J. (1993). What we have learned about policy and growth from cross-country regressions?. *The American Economic Review*,*83*(2), 426-430.

Meļihovs, A., & Kasjanovs, I. (2011). *The convergence processes in Europe and Latvia (No. 2011/01)*. Latvijas Banka.

North, D. C. (1990). Institutions, institutional change and economic performance. Cambridge university press.

OECD Publishing. (2015). OECD Economic Surveys: Latvia 2015. OECD Pub.

Ohno, K. (2009). Avoiding the middle-income trap: renovating industrial policy formulation in Vietnam. *ASEAN Economic Bulletin*, *26*(1), 25-43.

Peng, C. Y. J., Lee, K. L., & Ingersoll, G. M. (2002). An introduction to logistic regression analysis and reporting. *The Journal of Educational Research, 96*(1), 3-14.

Quah, D. T. (1996). Empirics for economic growth and convergence. *European economic review, 40*(6), 1353-1375.

Rodrik, D. (2008). The real exchange rate and economic growth. *Brookings papers on economic activity, 2008*(2), 365-412.

Sala-i-Martin, X. X. (1996). Regional cohesion: evidence and theories of regional growth and convergence. *European Economic Review, 40*(6), 1325-1352.

Sala-i-Martin, X. X. (1996). The classical approach to convergence analysis.*The economic journal*, 1019-1036.

Sala-i-Martin, X. X. (1997). I just ran four million regressions (No. w6252). National Bureau of Economic Research.

Staehr, K. (2015). Economic Growth and Convergence in the Baltic States: Caught in a Middle-Income Trap?. *Intereconomics, 50*(5), 274-280.

Strašuna, L. (2015, July) General Government spending - how much and on what. Macro Research: The Latvian Economy. Retreived from https://www.swedbank.lv/files/analitiskie_materiali/menesa_apskats/The_Latvian_Economy_2015_07_EN.pdf

The World Bank Database (2014, March 7). Updated Income Classifications. Retrieved November 20, 2015, from http://data.worldbank.org/news/2015-country-classifications

Tho, T. V. (2013). The middle-income trap: Issues for members of the Association of Southeast Asian nations. *Asian Development Bank Institute Working Paper, 421*.

Williams, R. (2012). Using the margins command to estimate and interpret adjusted predictions and marginal effects. *Stata Journal, 12*(2), 308.

Williams., R. Marginal Effects for Continuous Variables. February, 2015. *University of Notre Dame.* Retreive 06.02.2016 from: https://www3.nd.edu/~rwilliam/stats3/Margins02.pdf

Woo, W. T. (2012). China meets the middle-income trap: the large potholes in the road to catching-up. *Journal of Chinese Economic and Business Studies,10*(4), 313-336.

Ye, L., & Robertson, P. E. (2013). On the Existence of a Middle-Income Trap. *Economics Discussion Paper 13.12.* University of Western Australia

Zhang, L., Yi, H., Luo, R., Liu, C., & Rozelle, S. (2013). The human capital roots of the middle income trap: the case of China. *Agricultural Economics,44*(s1), 151-162.

8. Appendices

Appendix A. All middle income level countries identified between 1960 and 2014.

	Nr of obs.	% trapped		Nr of obs.	% trapped		Nr of obs.	% trapped		Nr of obs.	% trapped
Albania	3	0%	Turkey	55	27%	Panama	49	12%	Macedonia	23	48%
Austria	11	0%	Ukraine	7	29%	Czech Rep	24	13%	Guatemala	35	49%
Belarus	13	0%	Mexico	55	29%	Singapore	31	13%	New Zealand	32	50%
China	3	0%	Poland	44	30%	Israel	55	15%	Algeria	36	53%
Finland	21	0%	Portugal	55	31%	Estonia	24	17%	S. Africa	20	55%
France	9	0%	Spain	55	31%	Slovenia	24	17%	Jordan	16	56%
Hong Kong	32	0%	Romania	41	32%	Mauritius	29	17%	Peru	36	58%
Japan	16	0%	Ukraine	22	32%	Serbia	17	18%	Nicaragua	21	62%
Korea, Rep.	39	0%	Cyprus	55	33%	Ireland	39	18%	Eq. Guinea	12	67%
Latvia	21	0%	Russia	24	33%	Slovakia	25	20%	Jamaica	55	67%
Lithuania	21	0%	Suriname	44	34%	Thailand	18	22%	Venezuela	55	67%
Malaysia	34	0%	Chile	55	35%	Italy	21	24%	Argentina	51	69%
Montenegro	5	0%	Lebanon	43	40%	Hungary	44	25%	Ecuador	26	69%
Tunisia	3	0%	Iran	48	40%	Colombia	53	26%	Barbados	11	100%
Dom. Rep.	41	2%	Croatia	24	42%	Bulgaria	37	27%	Bolivia	11	100%
Macao SAR	30	3%	Uruguay	55	44%	Brazil	55	27%	Djibouti	4	100%
Malta	44	9%	Greece	55	45%	Costa Rica	55	27%	El Salvador	27	100%

Created by the authors.

Appendix B. All Middle Income Traps identified between 1960 and 2014.

Algeria	1961	-	1966
	1971	-	1973
	1987	-	1995
	2014	-	2014
Argentina	1960	-	1988
	1997	-	2002
Barbados	2004	-	2014
Bolivia	1960	-	1970
Brazil	1980	-	1982
	1988	-	1990
	1996	-	2004
Bulgaria	1990	-	1999
Chile	1961	-	1977
	1982	-	1983
Colombia	1960	-	1966
	1996	-	2002
Costa Rica	1961	-	1965
	1976	-	1985
Croatia	1991	-	1995
	2010	-	2014
Cyprus	1960	-	1961
	1971	-	1974
	1997	-	2000
	2007	-	2014
Czech Republi	1991	-	1991
	1997	-	1998
Djibouti	1978	-	1981
Dominican Re	1965	-	1965
Ecuador	1960	-	1967
	1981	-	1990
El Salvador	1960	-	1985
	2014	-	2014
Eq. Guinea	2007	-	2014
Estonia	1991	-	1994
Greece	1979	-	1995
	2007	-	2014
Guatemala	1960	-	1963
	1979	-	1991
Hungary	1986	-	1996
Iran	1978	-	1989
	2008	-	2014
Ireland	1981	-	1987
Israel	1998	-	2005
Italy	2010	-	2014
Jamaica	1963	-	1968
	1972	-	1982
	1995	-	2014
Jordan	1966	-	1972
	1985	-	1986
Lebanon	1971	-	1976
	1978	-	1979
	1987	-	1990
	1997	-	2001
Macao SAR	1999	-	1999
Macedonia	1991	-	2001
Malta	2001	-	2004
Mauritius	1960	-	1964
Mexico	1983	-	1988
	1994	-	1996
	2003	-	2004
	2008	-	2010
	2013	-	2014
New Zealand	1982	-	1984
	1986	-	1993
	2003	-	2007
Nicaragua	1968	-	1980
Panama	1972	-	1972
	1996	-	2000
Peru	1967	-	1968
	1971	-	1971
	1974	-	1991
Poland	1978	-	1990
Portugal	1976	-	1977
	2000	-	2014
Romania	1985	-	1997
Russia	1991	-	1998
Serbia	1995	-	1997
Singapore	1961	-	1964
Slovakia	1990	-	1994
Slovenia	2011	-	2014
South Africa	1997	-	2000
	2008	-	2014
Spain	1979	-	1984
	2004	-	2014
Suriname	1986	-	2000
Thailand	1997	-	2000
Turkey	1960	-	1964
	1977	-	1981
	1997	-	2001
Ukraine	1994	-	1995
UK	1967	-	1973
Uruguay	1960	-	1971
	1980	-	1985
	1998	-	2003
Venezuela, RB	1960	-	1968
	1976	-	1987
	1995	-	2003
	2008	-	2014

Created by the authors.

Appendix C. Prediction models

Logit regressions	**Model 1**	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
GDP per capita x1000	**0.147****	0.313***		0.131*		1.340***	0.197***		
Investment % of GDP	**-0.088*****	-0.052***		-0.057**	-0.035**		-0.060**		
Gov. % of GDP	**0.135*****	0.215***	0.155***	0.115***	0.202***	0.801**	0.233***	0.330***	0.359***
(Relative) Trade openness	**-0.026*****	-0.032***	-0.040***					-0.028***	-0.030***
(Relative) Freedom to trade internationally	**-0.014****			-0.020***	-0.019***				
(Relative) Legal System & Property Rights	**-0.016****		-0.020***	-0.018**	-0.013***				
Tertiary edu.enrol.	**-0.047*****	-0.029***		-0.031***					
Foreign direct investment, net inflows (% of GDP)	**-0.086****		-0.126**						
Current Account	**-0.081*****		-0.069**	-0.059**					
Price lev. of cap. stock	**1.022***			1.802***					
Inflation	**0.007*****		0.009***	0.008***		0.075***			
(Relative) Relative TP wealth	**3.622*****		3.796***	2.657*	3.568***			5.551**	5.595**
(Relative) Extensive Margin	**0.012*****								
(Relative) Credit market regulations	**-0.010***								
Legal System & Property Rights		-0.242**							
Regulation		-0.262**							
Freedom to trade internationally		-0.251***							
(Relative) Tertiary edu.enrol.			-0.009**						
Consumption % of GDP			-0.054**						
(Relative) Price lev. of cap. stock			0.010**						
Export Diversification			0.548**		0.367*				
Economic Complexity			-0.690*	-0.684*					
Trade openness				-0.042***			-0.026***		
(Relative) Sound Money					-0.013***				
(Relative) Exports % as of GDP					-0.026***				
TP growth					-45.88***				
Price of investment						0.116***		0.032**	0.036**
Size of Government						-1.424**			
Protection of property rights						-1.717**			
Credit market regulations						-1.504***			
GINI index (World Bank estimate)						0.512***		0.133**	0.138**
(Relative) Researchers in R&D (per million people)						-0.002***			
Tariff rate, applied, simple mean, all products (%)						0.822***			
Cash surplus % of GDP						-0.395*			
Taxes on income, profits and capital gains (% of revenue)							0.059**	0.053*	0.063**
Taxes on goods and services (% of revenue)							-0.090***	-0.057*	-0.053*
Government Effectiveness (estimate)							-1.793***		
Control of Corruption (estimate)								-1.030*	
Lending interest rate								0.008**	
Voice and Accountability (estimate)									-1.330*
Interest rate spread (lending rate minus deposit rate, %)									0.025**
_cons	**1.029**	1.081	1.65	1.858	1.149	-37.49***	-2.600	-14.66***	-15.66***
Observations	**1143**	1420	1078	1096	1564	471	768	583	578

Source: Authors' calculations.

Model 1 is the main MIT prediction model.

* Statistically significant at the 10% level.

** Statistically significant at the 5% level.

*** Statistically significant at the 1% level.

Created by the authors.

Appendix D. Cross-correlation table of the main prediction model.

	GDP per capita	Investment (% of GDP)	Government (% of GDP)	Trade openness	Freedom to trade internationally	Legal system & property rights	Enrolment in tertiary education	FDI, net inflows (% of GDP)	Current account balance	Price level of capital stock	Inflation	Inc. level relative to trading partners	Extensive trade diversification	Credit market regulations
GDP per capita	1.00													
Investment (% of GDP)	0.04	1.00												
Government (% of GDP)	0.43	0.00	1.00											
Trade openness	0.01	0.17	0.19	1.00										
Freedom to trade internationally	0.30	-0.02	0.19	0.16	1.00									
Legal system & property rights	0.55	0.12	0.29	0.09	0.42	1.00								
Enrolment in tertiary education	0.64	0.02	0.25	-0.02	0.12	0.22	1.00							
FDI, net inflows (% of GDP)	0.18	-0.04	0.10	0.25	0.08	0.14	0.14	1.00						
Current account balance	-0.01	-0.17	-0.10	-0.01	-0.09	-0.06	0.02	-0.19	1.00					
Price level of capital stock	0.50	-0.08	0.16	0.10	0.06	0.12	0.38	0.14	-0.15	1.00				
Inflation	-0.12	-0.01	0.00	-0.09	-0.11	-0.14	-0.04	-0.07	0.04	-0.10	1.00			
Inc. level relative to trading partners	0.91	0.07	0.45	-0.08	0.33	0.55	0.52	0.06	-0.02	0.38	-0.09	1.00		
Extensive trade diversification	-0.15	-0.12	-0.14	-0.01	-0.22	-0.24	-0.12	0.14	0.00	0.21	-0.02	-0.22	1.00	
Credit market regulations	0.00	-0.09	-0.27	0.20	0.36	0.03	-0.09	0.02	-0.02	0.04	-0.28	-0.01	-0.01	1.00

Created by the authors.

Appendix E. Example of individual regressions.

Logit regressions	Model 1	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5	Spec. 6	Spec. 7	Spec. 8	Spec. 9	Spec. 10	Model 2	Model 3	Model 4	Model 5
Population growth	25.17	-2.666	-7.444	8.312	-4.402	37.26**	0.392	-2.973	-0.041	4.683	-2.337	2.467	33.21	18.72	3.653
GDP per capita x1000	0.145**	0.214***	0.273***	0.278***	0.262***	0.184***	0.160***	0.283***	0.245***	0.227***	0.267***	0.311***		0.125*	
Investment (% of GDP)	-0.087***	-0.070***	-0.051***	-0.046**	-0.050***	-0.067***	-0.070***	-0.062***	-0.065***	-0.068***	-0.047**	-0.056***		-0.057**	-0.026
Government (% of GDP)	0.137***	0.253***	0.253***	0.248***	0.249***	0.228***	0.240***	0.224***	0.254***	0.271***	0.230***	0.216***	0.163***	0.118***	0.202***
(Relative) Trade openness	-0.027***	-0.033***	-0.036***	-0.043***	-0.040***	-0.031***	-0.031***	-0.036***	-0.032***	-0.029***	-0.036***	-0.032***	-0.040***		
Enrolment in tertiary education	-0.045***	-0.039***	-0.045***	-0.041***	-0.035***	-0.037***	-0.043***	-0.034***	-0.041***	-0.049***	-0.040***	-0.038***		-0.028**	
(Relative) Freedom to trade internationally	-0.013**		-0.023***									-0.017***		-0.019***	-0.018***
(Relative) Legal system & property rights	-0.015**			-0.024***									-0.018**	-0.017**	-0.012***
Foreign direct investment, net inflows (% of GDP)	-0.082**				-0.146***								-0.104**		
Current account balance	-0.077**					-0.020							-0.060*	-0.057*	
Price level of capital stock	1.058*						1.399***							1.856***	
Inflation	0.007***							0.012***					0.009***	0.009***	
Income level relative to trading partners	3.517***								-1.406				3.550***	2.466*	3.591***
(Relative) Extensive trade diversification	0.012***									0.009***					
(Relative) Credit market regulations	-0.011**										-0.018***				
Legal system & property rights												-0.286***			
Regulation												-0.288**			
Private consumption (% of GDP)													-0.055**		
Trade openness														-0.041***	
(Relative) Enrolment in tertiary education													-0.009**		
(Relative) Price level of capital stock													0.010**		
Export diversification													0.400		0.422**
Economic Complexity Index													-0.643*	-0.607*	
(Relative) Exports (% of GDP)															-0.025***
(Relative) Access to Sound Mony															-0.014***
Trading partners growth															-46.87***
_cons	0.618	-2.142**	-0.572	-0.277	-2.128**	-1.837**	-2.053**	-3.203***	-1.811**	-3.521***	-1.048	1.791	1.587	1.453	0.528
N	1146	1650	1529	1473	1553	1375	1650	1463	1650	1645	1522	1413	1081	1099	1543

Source: Authors' calculations.

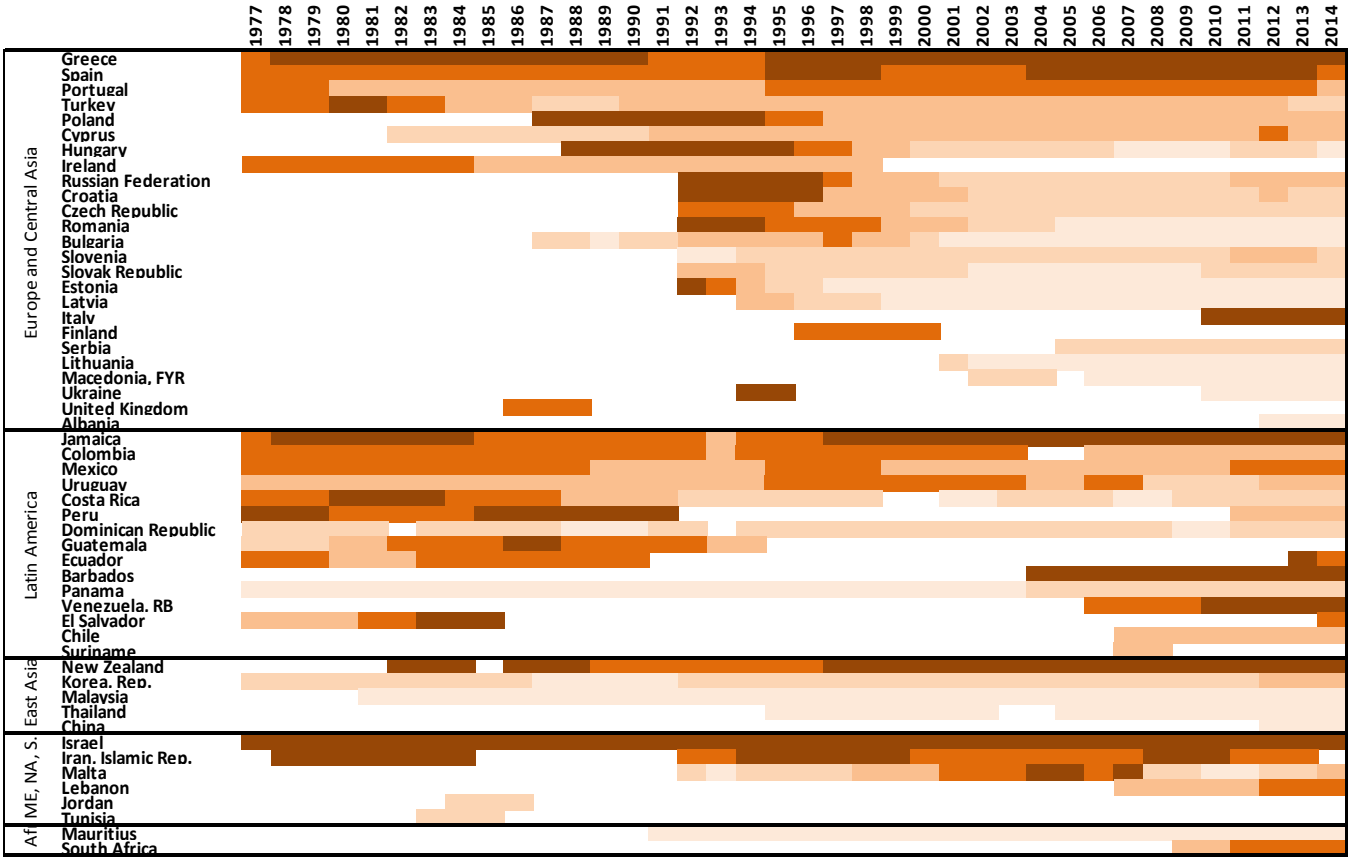
* Statistically significant at the 10% level.

** Statistically significant at the 5% level.

*** Statistically significant at the 1% level.

Created by the authors.

Appendix F. Estimated MIT probabilities using the main prediction model for all countries in specific year.



Created by the authors. Five tones of the orange colour represent our estimated probability for country being in middle income trap in specific year. The darker the colour, the higher is our main regression model's estimated probability. Colours are divided into five equal quintiles.

Appendix G. Scenario adjustments

			Current values			Adjustment (HIC)			Adjustment (MIC)		
Factors	HIC	MIC	EE	LV	LT	EE	LV	LT	EE	LV	LT
Investment (% of GDP)	21.7	23.2	28.0	24.6	19.8	0.0	0.0	2.0	-4.9	-1.4	3.4
Government (% of GDP)	18.5	16.4	19.1	18.6	17.3	-0.5	-0.1	0.0	-2.6	-2.2	-0.9
(Relative) Freedom to trade internationally	107	100	112	110	104	0.0	0.0	3.7	-11.7	-9.7	-3.7
(Relative) Legal system & property rights	140	100	129	115	113	11.2	25.0	26.9	-29.1	-15.3	-13.4
Enrolment in tertiary education	69.2	58.3	76.9	66.3	72.6	0.0	2.9	0.0	-18.5	-7.9	-14.3
(Relative) Credit market regulations	108	100	119	108	113	0.0	0.0	0.0	-19.5	-8.5	-12.8
Freedom to trade internationally	7.9	7.3	8.2	8.0	7.6	0.0	0.0	0.3	-0.9	-0.8	-0.3
Legal system & property rights	7.9	5.6	7.3	6.5	6.4	0.6	1.4	1.5	-1.7	-0.9	-0.8
Regulation	7.8	6.9	7.8	7.5	7.8	0.0	0.3	0.0	-0.9	-0.6	-0.9
(Relative) Private consumption (% of GDP)	51.5	61.7	50.2	60.6	63.0	1.3	0.0	0.0	11.5	1.1	-1.3
(Relative) Enrolment in tertiary education	119	100	132	114	125	0.0	5.0	0.0	-32.4	-14.2	-25.1
Economic Complexity Index	1.3	0.4	0.8	0.6	0.7	0.5	0.6	0.6	-0.4	-0.3	-0.3
GINI index	31.1	39.2	33.0	35.6	34.5	-2.0	-4.6	-3.5	6.1	3.6	4.7
(Relative) Size of government	5.7	6.4	6.0	5.8	7.1	0.0	0.0	0.0	0.5	0.7	-0.7
Protection of property rights	8.0	5.3	7.0	5.7	5.4	1.1	2.3	2.6	-1.7	-0.4	-0.1
Credit market regulations	9.0	8.3	10.0	9.1	9.4	0.0	0.0	0.0	-1.6	-0.7	-1.1
Researchers in R&D (per million people)	4718	1714	3384	1858	2792	1334	2860	1926	-1669	-144	-1077
Government budget balance (% of GDP)	-0.4	-3.1	0.7	-1.5	-0.7	0.0	1.1	0.3	-3.8	-1.6	-2.4
Taxes on income, profits and capital gains	31.5	22.4	8.7	8.5	8.6	0.0	0.0	0.0	13.7	13.9	13.8
Taxes on goods and services (% of revenue)	27.3	32.9	40.4	35.5	36.3	0.0	0.0	0.0	-7.5	-2.6	-3.4
Government effectiveness	1.6	0.3	1.0	0.8	0.8	0.6	0.8	0.8	-0.7	-0.5	-0.5
Control of corruption	1.8	0.1	1.1	0.2	0.3	0.7	1.5	1.4	-1.0	-0.2	-0.3
Voice and accountability	1.1	0.3	1.1	0.8	0.9	0.0	0.4	0.2	-0.9	-0.5	-0.7

Created by the authors.

Appendix H. MIT predictions for Baltics with "HIC" and "MIC" scenario adjustments

Scenario	**Model 1**	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Average
EE	**0.50%**	4.00%	0.90%	0.90%	2.80%	0.00%	1.20%	1.00%	0.70%	1.30%
EE - HIC	**0.40%**	3.10%	0.50%	0.50%	2.20%	0.00%	0.40%	0.30%	0.50%	0.90%
EE->HIC	*-0.10%*	*-0.90%*	*-0.50%*	*-0.40%*	*-0.60%*	*0.00%*	*-0.80%*	*-0.70%*	*-0.30%*	*-0.50%*
EE - MIC	**2.70%**	11.00%	1.00%	4.00%	3.50%	12.30%	12.50%	7.50%	6.60%	6.80%
EE->MIC	*2.20%*	*7.00%*	*0.10%*	*3.20%*	*0.70%*	*12.30%*	*11.20%*	*6.50%*	*5.90%*	*5.50%*
LV	**2.10%**	6.00%	4.50%	4.40%	8.30%	0.10%	2.60%	13.10%	8.40%	5.50%
LV - HIC	**1.20%**	3.70%	1.70%	1.70%	6.00%	0.00%	0.70%	1.60%	2.90%	2.20%
LV->HIC	*-0.90%*	*-2.40%*	*-2.80%*	*-2.70%*	*-2.30%*	*-0.10%*	*-1.90%*	*-11.50%*	*-5.50%*	*-3.30%*
LV - MIC	**4.00%**	8.60%	5.40%	8.40%	8.20%	0.40%	11.60%	24.60%	25.70%	10.80%
LV->MIC	*1.90%*	*2.60%*	*0.90%*	*4.10%*	*-0.10%*	*0.30%*	*9.00%*	*11.50%*	*17.30%*	*5.30%*
LT	**1.80%**	4.70%	1.70%	2.50%	4.20%	0.00%	2.20%	1.80%	0.80%	2.20%
LT - HIC	**1.00%**	2.80%	0.70%	0.90%	2.60%	0.00%	0.50%	0.30%	0.40%	1.00%
LT->HIC	*-0.90%*	*-1.90%*	*-1.00%*	*-1.60%*	*-1.60%*	*0.00%*	*-1.70%*	*-1.50%*	*-0.40%*	*-1.20%*
LT - MIC	**3.40%**	7.80%	3.10%	4.80%	4.00%	0.10%	10.40%	7.40%	6.30%	5.20%
LT->MIC	*1.60%*	*3.10%*	*1.40%*	*2.30%*	*-0.20%*	*0.10%*	*8.30%*	*5.60%*	*5.50%*	*3.10%*
Mean of trapped obs.	58.70%	43.60%	51.30%	54.60%	42.10%	54.10%	37.30%	41.70%	39.60%	47.00%
Mean of all obs.	31.60%	28.90%	29.50%	30.20%	26.50%	20.80%	22.20%	20.30%	19.50%	25.50%
Mean of non-trapped obs.	20.00%	22.80%	20.30%	20.10%	20.00%	10.60%	16.90%	13.80%	13.70%	17.60%
Difference	38.60%	20.90%	31.00%	34.50%	22.10%	43.50%	20.40%	27.90%	26.00%	29.40%

Created by the authors.

Appendix I. Predicted MIT probabilities for all countries in 2014.

Country	MIT probability	Country	MIT probability
Albania	0.35%	Macedonia, FYR	0.65%
Barbados	93.50%	Malaysia	0.03%
Bulgaria	1.12%	Malta	27.50%
Chile	14.86%	Mauritius	0.78%
China	0.46%	Mexico	30.19%
Colombia	16.49%	New Zealand	96.03%
Costa Rica	5.56%	Panama	2.47%
Croatia	8.67%	Peru	16.85%
Cyprus	23.82%	Poland	16.26%
Czech Republic	3.85%	Portugal	23.20%
Dominican Republic	4.58%	Romania	0.45%
Ecuador	68.28%	Russian Federation	13.69%
El Salvador	67.24%	Serbia	5.89%
Estonia	**0.46%**	Slovak Republic	4.77%
Greece	79.06%	Slovenia	9.23%
Hungary	1.96%	South Africa	41.08%
Israel	90.12%	Spain	65.95%
Italy	89.30%	Thailand	0.13%
Jamaica	94.27%	Turkey	6.86%
Korea, Rep.	13.79%	Ukraine	1.59%
Latvia	**2.06%**	Uruguay	16.20%
Lebanon	46.66%	Venezuela, RB	85.89%
Lithuania	**1.82%**		

Created by the authors.

Appendix J. Data sources.

	Descriptions	Sources	Start	End	# of obs.
Economic Development	Extensive trade diversification	IMF	1962	2010	2149
	Enrolment in tertiary education	WDI	1970	2014	1760
	Domestic credit by financial sector (% of GDP)	WDI	1997	2014	420
	Pay and productivity	WEF	2006	2014	419
	Education expenditure (% of GDP)	WDI	1970	2014	1575
	Government exp. on education (% of GDP)	WDI	1970	2014	1575
	Compensation of employees (% of expense)	WDI	1990	2013	871
	GDP per capita	WDI	1955	2014	2154
	Prevalence of foreign ownership	WEF	2006	2014	419
	Availability of financial services	WEF	2006	2014	270
	Domestic credit to private sector	WDI	1997	2014	420
	Credit market regulations	EF	1970	2013	1751
	Technological adoption	WEF	2006	2014	270
	PCT patents, applications/million pop	WEF	2006	2014	184
	Innovation and business sophistication	WEF	2006	2014	380
	Economic Freedom Index	EF	1970	2013	1661
	Self-employed (% of total employed)	WDI	1980	2014	1165
	Health expenditure (% of GDP)	WDI	1995	2013	1004
	Export diversification	IMF	1962	2010	2149
	Global Competitiveness Index	WEF	2006	2014	380
	Total Factor Productivity	PWT	1955	2011	1912
	Economic Complexity Index	OEC	1964	2013	1912
	Researchers in R&D (per million people)	WDI	1996	2014	744
	Labor force with tertiary education (% of total)	WDI	1982	2014	901
	Quality of overall infrastructure	WEF	2006	2014	419
	Urban population (% of total)	WDI	1960	2014	2154
	Population growth	PWT*	1954	2014	2097
	Market capitalization to GDP	WDI	1975	2014	1020
Macroeconomic Environment	Government (% of GDP)	PWT	1960	2014	2031
	Investment (% of GDP)	PWT	1960	2014	1987
	Agriculture (% of GDP)	WDI	1960	2014	1537
	Trade openness	PWT	1955	2009	2147
	Regulatory trade barriers	EF	1995	2013	830
	Tariffs	EF	1970	2013	1712
	Imports (% of GDP)	WDI	1960	2014	2033
	Freedom to trade internationally	EF	1970	2013	1714
	Mean tariff rate (%)	WDI	1988	2013	1116
	Exports (% of GDP)	WDI	1960	2014	2033
	Price level of imports	PWT	1955	2011	2097
	Current account balance	WDI	1980	2015	1531
	Price level of exports	PWT	1955	2011	2097
	Inflation	WDI	1961	2014	1851
	Government budget balance (% of GDP)	WDI	1990	2013	857
	Price level of capital stock	PWT	1955	2011	2097
	FDI, net inflows (% of GDP)	WDI	1970	2014	1738
	Macroeconomic environment	WEF	2006	2014	419
	Standard deviation of inflation	EF	1970	2013	1761
	Access to Sound Mony	EF	1970	2013	1772
	Interest rate spread (%)	WDI	1960	2014	1367
	Money growth	EF	1970	2013	1717
	Employment of population (%)	PWT*	1955	2014	2077
	Region GDP growth	WDI*	1960	2014	2154
	Real effective exchange rate	Bruegel	1960	2015	2097
	Income level relative to trading partners	WDI &	1960	2014	2147

	Descriptions	Sources	Start	End	# of obs.
Governance	Cooperation in labor-employer relations	WEF	2006	2014	419
	Diversion of public funds	WEF	2006	2014	419
	Wastefulness of government spending	WEF	2006	2014	419
	Burden of government regulation	WEF	2006	2014	419
	Voice and accountability	WGI	1996	2014	973
	Government efficiency	WEF	2006	2014	419
	Control of corruption	WGI	1996	2014	973
	Legal system & property rights	EF	1970	2013	1627
	Government effectiveness	WGI	1996	2014	973
	Resource efficiency	BTI	2004	2014	389
	Protection of property rights	EF	1995	2013	826
	Market Economy Status Index	BTI	2004	2014	389
	Ethical behavior of firms	WEF	2006	2014	419
	Corporate ethics	WEF	2006	2014	419
	Institutions	WEF	2006	2014	419
	Ethics and corruption	WEF	2006	2014	419
	Efficiency of legal framework in settling disp.	WEF	2006	2014	308
	Effect of taxation on incentives to invest	WEF	2006	2014	142
	Anti-corruption policy	BTI	2004	2014	389
	Rule of law (WGI)	WGI	1996	2014	973
	Efficienct use of talent	WEF	2006	2014	419
	GINI index	WDI	1981	2013	1022
	Judicial independence (WEF)	WEF	2006	2014	419
	Black market exchange rates	EF	1970	2013	1776
	Policy coordination	BTI	2004	2014	389
	Political and social integration	BTI	2004	2014	389
	Sustainability	BTI	2004	2014	389
	Welfare regime	BTI	2004	2014	389
	Civil rights	BTI	2004	2014	389
	Accountability	WEF	2006	2014	419
	No. of days to start a business	WEF	2006	2014	401
	Organization of the market and competition	BTI	2004	2014	389
	Public institutions	WEF	2006	2014	419
	Flexibility of wage determination	WEF	2006	2014	419
	BTI Status Index (democracy and market)	BTI	2004	2014	389
	Rule of law (BTI)	BTI	2004	2014	389
	Social capital	BTI	2004	2014	389
	Regulation	EF	1970	2013	1614
	Country capacity to retain talent	WEF	2006	2014	142
	Irregular payments and bribes	WEF	2006	2014	270
	Taxes on goods and services (% of revenue)	WDI	1990	2013	855
	Stateness (BTI)	BTI	2004	2014	389
	Regulatory Quality	WGI	1996	2014	973
	Country capacity to attract talent	WEF	2006	2014	142
	Judicial independence (EF)	EF	1995	2013	821
	Taxes on income, profits and capital gains	WDI	1990	2013	862
	Steering capability	BTI	2004	2014	389
	Undue influence	WEF	2006	2014	419
	Top marginal tax rate	EF	1970	2013	1516
	Labor market regulations	EF	1970	2013	1070
	Impartial courts	EF	1995	2013	933
	Ease of access to loans	WEF	2006	2014	419
	Resolving insolvency	EODB	2003	2015	479

*Compiled by authors using data from given source.

Data gathered from the World Bank, World Development Indicators (WDI), Penn World Tables (PWT), Economic Freedom of the World by the Fraser Institute (EF), Global Competitiveness Report by World Economic Forum (WEF), Bertelsmann Stiftung Index (BTI), Bruegel datasets, Ease of Doing Business (EODB) and World Governance Indices (WGI). As BTI surveys are conducted over two years before reporting, we lag all data by two years to more appropriately correspond to the year of possible trap. Similarly, we lag all GCR variables by one year because of many variables that actually correspond to previous years.

Created by the authors.