Globalization report 2014

Who benefits most from globalization?

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Contents

Executive summary

The “Globalization report 2014: Who benefits most from globalization?” study comprises two parts. The first part focuses on the question to what extent different countries have benefited from globalization in the past and to which degree this is possible in the future. The second part uses the Prognos Free Trade and Investment Index to offer a differentiated measure for the attractiveness of foreign markets for German companies.

The methodology of the ex-post analysis in the first section of the report is based on scenario calculations for 42 countries during the period 1990–2011. One scenario assumes that globalization has not progressed further since the beginning of the study period. The comparison of this scenario and the actually observed economic development then allows the quantification of globalization-induced gains in added value and a comparison across nations.

Key findings of the ex-post analysis based on scenario calculations can be summarized as follows:

- If we add up the differences in the gross domestic product per capita between the scenario and the historically observed development over the entire study period, Finland achieves the greatest globalization gains among all the countries under review, with an annual average of €1500 per capita. From this perspective, Germany ranks in the top third along with many smaller European countries. By contrast, the large developing nations finished exclusively at the bottom of the ranking.

- The weak positions of developing nations – especially that of China – can be traced back among other things to the low economic output per capita in the initial year of the study period. As such, the average annual globalization-induced income gain per capita in relation to the gross domestic product per capita in 1990 was around 18.5 percent for China, compared to just under 6 percent for Germany and a mere 2 percent for the United States.

The projections in the first part of the report are based on two additional scenario calculations with the help of the macroeconomic model VIEW. The “accelerated globalization” scenario assumes that, in the future, globalization will progress one and a half times as fast as in the past. In the “diverging globalization” scenario, the economic development is simulated under conditions in which the level of integration with the rest of the world is assumed to have stagnated in Greece, Portugal and Spain.

The essential results of the projections can be summarized as follows:

- The “accelerated globalization” scenario shows that Eastern European countries and major developing nations in particular can anticipate elevated growth rates of around 0.5 percentage points until the year 2020, if the pace of globalization were to increase by 50 percent. By contrast, significantly lower growth could be anticipated for major national economies with a high per capita income.

- In the “diverging globalization” scenario, declines in growth are, as anticipated, most extreme in the countries that are directly affected by the modeled stagnation in globalization: Greece, Portugal and Spain. By the year 2020, these nations would lose up to one percentage point in yearly economic growth. National economies that would indirectly suffer the heaviest impact, such as Italy, are key trade partners of the directly affected countries.

The Prognos Free Trade and Investment Index – the main component of the study’s second part – bundles a broad spectrum of economic, institutional and sociopolitical indicators into a comprehensive measure of the attractiveness of foreign markets for German companies. While the presentation as a ranking ensures clarity, the large number of countries under consideration and a high degree of detail in the set of indicators enable us to recognize the foreign markets whose appeal for German companies is still underestimated so far.

The key findings of the analysis based on the Prognos Free Trade and Investment Index can be summarized as follows:

- The Prognos Free Trade and Investment Index shows that despite the current crisis in the European Union and especially in the euro zone countries, the most attractive conditions for foreign activities by German decision makers continue to be found in European nations.

- Beyond that, the United States and some Asian countries offer the most appealing foreign markets for German companies.

1 Introduction

The increasing economic, political and social interconnectedness of the world is ubiquitous. It is evident in the steadily rising sales of German mechanical construction companies beyond the country's borders as well as in the fact that more Asians use Facebook than North Americans and that the United Nations now has almost as many members as there are sovereign states. As different as they may seem, all of these developments are manifestations of a worldwide phenomenon – globalization.

No one disputes that the world is becoming more interconnected. But how the consequences of globalization are evaluated is very different, and often ideologically motivated. Opponents of globalization, e.g., postulate that it promotes inequality between countries as well as within societies. Proponents of globalization reply that the international interconnectedness opens up new markets, enabling growth and wealth.

Numerous scientific studies attempt to provide an objective basis for the discussion. Bergh and Nilsson (2010) conclude that most notably the social aspects of globalization lead to greater inequality in net household income. Dreher (2006) finds that globalization has a significantly positive influence on economic growth. Dollar and Kray (2001), Greenaway et al. (1999) and the World Bank (2002) come to similar conclusions.

One weakness of the cited studies is that although they note the positive effect of globalization on growth, they do not quantify it sufficiently – leaving unclear the extent to which different countries benefit from globalization.

This Prognos globalization report is divided into two sections. The major focus on the topic of "Who benefits most from globalization?" is intended to close the knowledge gaps sketched out above. The goal of this study is to determine the extent to which all highly developed national economies and the key developing nations were able to benefit from the ongoing globalization between the years 1990 and 2011. The study thus reveals the greater and smaller beneficiaries of the globalization process which makes it possible to determine the "globalization champion". In a second step the future effects of globalization are estimated with the help of scenario calculations.

The second part of the globalization report focuses on the analysis of the economic, institutional and sociopolitical framework conditions in 100 national economies using the Prognos Investment and Free Trade Index. The index ranks these 100 economies and shows which foreign markets offer the greatest opportunities as well as the biggest risks for German exports and investment activities.

2 Who benefits most from globalization?

The first part of the globalization report quantifies the growth gains of developed national economies and leading developing nations.[1] To this end two analyses are carried out which differ with respect to the time periods as well as the study methods utilized.

The first analysis refers to the time period since the year 1990. It quantifies globalization with the help of a specifically designed index and also includes an econometric analysis of the interrelated effects between globalization and economic development. In combination, these findings allow for the conversion of the country-specific gains and losses related to globalization into a ranking and thereby determine the "globalization champion".

The second analysis is intended to exemplify the mechanics of globalization and to make them comparable across countries with the use of scenarios with regard to future developments. The methodology of this analysis is geared towards the macroeconomic model VIEW. The advantage of using VIEW lies in having the ability to directly model the most important channels of the macroeconomic effects of globalization. The following scenarios are studied in this way:

1. "Accelerated globalization" – This projection assumes that globalization continues to accelerate and that it progresses on average one and a half times as fast as in the past two decades.

2. "Diverging globalization" – This scenario assumes that international integration stagnates in countries in the southern euro zone while globalization maintains its pace in the remaining countries. This scenario is motivated by the currently uncertain financial situation in these countries which hampers foreign trade activity.

Both scenarios are anchored in the baseline projections of the Prognos World Report 2013 which enables a comparison of the scenario calculation results to a reliable benchmark.

1 The national economies being studied are the 42 countries from the Prognos World Report 2013. This list of countries includes all highly developed national economies as well as all the major developing nations, and thus around 90 percent of the global economic output.

2.1 Methodology

The detailed analysis of the interrelated effects between globalization and economic development forms the foundation for both parts of the study. The analysis of the ex-post time period uses the knowledge of the interrelated effects to quantify the economic changes brought about by globalization and to create a list of globalization beneficiaries. For the scenario calculations, this same knowledge forms the basis for directly modeling the essential mechanisms of globalization and for making predictions about future developments. The main steps of the approach for both analyses are described in detail as follows.

2.1.1 Determining the "globalization champion"

Determining the globalization champion encompasses the following process steps:

- Step 1: Conception of the globalization index
- Step 2: Studying the interrelated effects between globalization and economic development
- Step 3: Determining the "globalization champion"

Step 1: Conception of the globalization index

In order to quantify the economic effects of globalization the complex process that is globalization has to be made measurable first. This is done with the help of a comprehensive index which includes differentiated indicators that describe the economic as well as the political and social aspects of globalization (Table 1).[2]

The selected economic indicators are divided into two categories. The first category, "Transaction variables," includes indicators that refer to actual transactions of goods, services or financial assets. A larger transaction volume indicates that a country is more strongly interconnected with the rest of the world. The category, "Transaction restrictions," includes indicators for restrictions on the free transfer of goods and financial capital. Restrictions to transaction are a sign of a less globalized country. Both the social and political aspects of globalization are represented in the individual sub-indices of the KOF Index of Globalization.[3]

All in all, the selected indicators depict the process of globalization very well with regard to the depth and breadth of the sub-aspects under consideration. In order to achieve a comprehensive picture of globalization, the indicators must be compiled into an index.

2 Indicator selection is based on the KOF Index of Globalization, see Dreher (2006).

3 A similar simplification is not possible for the economic components of globalization, because a high degree of detail regarding the indicators is needed in the effect analyses for the future scenarios of globalization.

To this end, the data is first adjusted for outliers and then normalized to a standardized measure between 0 and 100.[4]

Table 1: Utilized globalization indicators

Indicators	Description	Source
Economic indicators		
Transaction variables		
Trade in goods (as a % of gross domestic product)	Total exports and imports of goods as a percentage of the gross domestic product.	World Bank, World Development Indicators, 2013
Trade in services (as a % of gross domestic product)	Total exports and imports of services as a percentage of the gross domestic product.	World Bank, World Development Indicators, 2013
Foreign direct investments (as a % of gross domestic product)	Total inward and outward foreign direct investments (stocks) as a percentage of the gross domestic product.	United Nations Conference on Trade and Development, 2012
Portfolio investments (in % of the gross domestic product)	Portfolio investments stock: Total assets and liabilities as a percentage of the gross domestic product.	International Monetary Fund, Coordinated Portfolio Investment Survey, 2013
Payments to foreigners (in % of the gross domestic product)	Sum of wage payments to foreign workers and return on capital as a percentage of the gross domestic product. Income from intangible assets is not captured.	World Bank, World Development Indicators, 2012
Transaction restrictions		
Import barriers	This indicator is based on the question in the Global Competitiveness Report: "In your country, do tariff and non-tariff barriers to trade reduce the opportunity of imported goods to compete on the domestic market?" The phrasing of the question has changed slightly over the years.	Fraser Institute, 2013
Import tariffs	Indicator between 0 and 10. Higher values mean lower import tariffs. A value of 0 reflects an average import tariff of 50%.	Fraser Institute, 2013
Taxes on international trade	Taxes on international trade include import and export tariffs, profits from monopolies, capital gains and taxes on capital gains.	World Bank, World Development Indicators, 2013
(as a % of tax revenues)	Index consisting of two equally weighted components. (1) Indicator based on the question in the Global Competitiveness Report: "How common is foreign corporate ownership in your country?" (2) Indicator of the International Monetary Fund that includes 13 types of capital controls.	Fraser Institute, 2013
Social indicators		
Sub-index "Social Globalization" of the KOF Index of Globalization	The sub-index includes indicators on personal contacts, information flows and cultural proximity.	ETH Zurich, KOF Index of Globalization, 2013
Political indicators		
Sub-index "Political Globalization" of the KOF Index of Globalization	The sub-index includes indicators such as the number of diplomatic representations and international agreements, membership in international organizations and participation in UN security missions.	ETH Zurich, KOF Index of Globalization, 2013

Source: Prognos 2014

4 To correct for oultiers, the manifestations of an indicator that lie below the 5 percent quantile and above the 95 percent quantile for this indicator are revised to the upper or lower limits for this quantile.

Higher values mean "more globalization" in each instance. [5] The correction for outliers is justified due to technical reasons as well as reasons that relate to the objective of the study: With respect to the latter, not every extreme event is an expression of globalization[6]; and technical, because outliers lead to distorted values after indicators are normalized.

In the next step, the econometric indicators are first compiled into a sub-index. This is done separately for the indicators in the two categories, transaction variables and transaction restrictions. Principal component analysis is applied as a statistical weighting which investigates the possible linear combinations of the individual indicators and selects the weighting factors such that the variance of the weighted sum of all indicators is maximized. This way the principal component analysis maximizes the statistical power of the resulting index. The resulting sub-indices for both categories are assigned equal weights when forming the sub-index that relates to the economic facet of globalization.[7]

Subsequently the three sub-indices are aggregated into a globalization index. Here the economic sub-index is assigned a weight of 60 percent while the social as well as political sub-indices are weighted at 20 percent. This intentional specification reflects the idea that the economic facets of globalization are considered most important when it comes to economic development. Thus, the disproportionate weighting of the economic components should always be seen as linked to the objectives of this study and does not represent a general value judgment concerning the significance of the individual components for globalization.

Some of the time series used exhibit data gaps. Missing values are treated as follows: Gaps in the midst of a series are linearly interpolated. The most recent available data points substitute for missing values at the beginning or end of a time series. If an indicator is not available for a country for the entire period of time, the entire series is imputed using regression analyses. To this end, an indicator is explained through all other utilized indicators in an auxiliary regression analysis. Knowledge about the explanatory power and manifestations of the existing indicators enables us to approximate the indicator that is unavailable.

Step 2: Studying the interrelated effects

The goal of this process step is to quantify the effect of globalization on growth using regression analysis. This enables us to filter out the effect of individual influencing variables on economic growth by statistically controlling for the effects of other explanatory variables of economic development.

5 The following formula is used to normalize indicators for which rising values indicate „more globalization." (Xj,t − Min(X))/(Max(X) − Min(X)) * 100. The variable Xj,t is the individual manifestation of the indicator for the country j at time t. Max(X) and Min(X) are the maximum and minimum of this indicator for all countries and points in time. The following formula is used to normalize indicators for which rising values indicate „less globalization." (Max(X) − Xj,t)/(Max(X) − Min(X)) * 100.

6 For example, the goods turnover in Antwerp harbor overestimates the actual imports and exports for Belgium.

7 The weighting selected for the categories resembles that of the KOF Index of Globalization.

In the regressions, economic development is operationalized through the growth of economic output per capita in percent. The specifically designed globalization index serves as the central explanatory variable. The regression results for this variable indicate the extent to which economic development is driven by globalization. In light of the importance of globalization for a domestic economy's performance, we anticipate a positive and statistically significant effect for this variable.

To ensure that the influence of globalization is neither overestimated nor underestimated, further determinants of economic development must be taken into account (Table 2). The anticipated growth effects of these variables are based on both theoretical considerations and empirical findings:

- The level of the gross domestic product per capita is considered in light of the theory of economic convergence.[8] This theory states that domestic economies with a low gross domestic product per capita tend to display a higher rate of economic growth, which indicates a negative effect of this determinant.

- A higher birth rate has the short-term effect of distributing a given economic growth across a larger population base. Accordingly, we anticipate that higher birth rates correspond to smaller growth of economic output per capita.[9]

- By contrast, a positive on economic growth per capita can be assumed with regard to investment activities (private and public) because as a determinant of capital stock investments contribute substantially to the potential of national economies.

- The inflation rate serves as an indicator of macroeconomic stability. A low inflation rate is believed to stimulate economic activity, while a high inflation rate can counter overheated economic growth. Based on these considerations, we expect inflation to have a negative impact on economic growth.[10]

- Government spending as well as the debt ratio are considered key indicators of fiscal policy. While in terms of neoclassical theory and empirical findings we can assume that a high debt ratio is related to a reduction in economic growth, the influence of government spending is ambiguous a priori.[11] On the one hand, high government spending can crowd out private investment activity. On the other hand, consumptive public spending can generate additional demand, promoting private investment.

8 The gross domestic product per capita is entered in the regressions with its values delayed by two years to prevent the economic growth per capita as an independent variable being used partially to explain itself.

9 Over the long term, a high birth rate can have positive effects on economic growth. However, such effects are not the subject of this study.

10 Theoretically, this is not necessarily the case. Negative inflation rates (deflation) can be expected to exert negative effects on growth. However, in this analysis, with the exception of Japan, deflation phases are of minor importance.

11 See Reinhard and Rogoff (2010).

- Additionally, we control for the quality of the legal system with the Rule of Law Index. A highly developed legal system is considered an important prerequisite for strong economic growth.
- Secondary education as a proxy for human capital should have a positive impact on economic growth.
- We further control for the global economic crisis of 2008 and 2009 using an indicator variable.

Table 2: Variables with a potential influence on economic growth as control variables for the regression analysis

Variables that influence economic growth	Control variables	Source
Level of gross domestic product per capita	Gross domestic product per capita in the next-to-last period (in logarithms)	World Bank, World Development Indicators, 2013
Birth rate	Birth rate per woman (in logarithms)	World Bank, World Development Indicators, 2013
Investments	Gross capital formation (in % of the gross domestic product)	World Bank, World Development Indicators, 2013
Inflation	Increase in consumer prices (in %)	World Bank, World Development Indicators, 2013
Government spending	Government consumer spending (in % of the gross domestic product)	World Bank, World Development Indicators, 2013
Public debt	Public debt (in % of the gross domestic product)	International Monetary Fund, 2013
Quality of institutions	Rule of Law Index (scale from 0 to 10)	Fraser Institute, 2013
Secondary education	Number of secondary school attendants divided by the number of people entitled to secondary education (in %)	World Bank, World Development Indicators, 2013
Crisis indicator 2008–2009	Indicator variable with a value of 1 for the years 2008–2009 and a value of 0 for all other years.	

Source: Prognos 2014

The regression analysis includes all 42 countries contained in the Prognos World Report and addresses the period between 1992 and 2011.[12] Therefore, 20 data points are available for each country and each variable. This data structure is taken into account by means of specific panel regression models.[13]

Bei der genauen Spezifikation des Regressionsmodells müssen zwei potenzielle Problemquellen berücksichtigt werden: unbeobachtete Heterogenität und die mögliche Endogenität verschiedener Einflussgrößen.

In the specification of the regression model, two potential problem sources need to be taken into account: unobserved heterogeneity and possible endogeneity of different explanatory variables.

12 Since the gross domestic product per capita is used in the regressions with its values delayed by two years, the data used for the regressions refers to the period of time between 1990 and 2011.

13 All analyses were performed with the Stata 12 statistics program.

Unobserved heterogeneity is based on the circumstance that even a careful selection of determinants cannot ensure that all differences between the countries under consideration are adequately accounted for. If these unobserved characteristics correlate with neither the dependent variable nor the control variables under consideration, no complication arises. If this does not apply, unobserved heterogeneity becomes a problem because the explanatory power of unobserved characteristics may falsely be assigned to other determinants. Thus, unobserved heterogeneity can result in distorted estimates for all determinants. For this reason, fixed effects models were used in the analysis. These control for differences between the countries that can assumed to be approximately constant over the observed period of time.[14]

Endogeneity problems can, e.g., occur when interdependencies exist between the dependent variable and one or more determinants. This type of connection can, e.g., be surmised for investment activities and economic growth: Strong investment activities encourage economic growth (and constitutes part of it) while, at the same time, positive economic development leads to a positive investment climate. In such cases, the difficulty arises in that we cannot differentiate which changes in the determinant influence the dependent variable and which changes result from reverse causality. Endogeneity problems also lead to distorted results.

To account for potential endogeneity problems, instrumental variable procedures (short: IV methods) are used. In this two-step process (also called a two-stage least squares estimation), each variable for which an endogeneity problem has to be suspected is divided into two parts: one part that is exogenous with respect to the dependent variable and one endogenous part. In the second step of the process – the actual regression – only the exogenous part of the original regressor is taken into account. This ensures that no endogeneity problems exist in the final regression. In order to apply this method, at least one instrumental variable is needed for each potential endogenous determinant. It must be highly correlated with the endogenous explanatory variable while simultaneously holding explanatory power for the dependent variable, but must not be affected by the same endogeneity problem.

In this study the time series of the potentially endogenous control variables are lagged by one year and then used as instrumental variables. Under the assumption that the dependent variable can be affected by current and past growth rates of the gross domestic product, but not by future realizations, these time series meet all requirements for suitable instrumental variables. Based on this approach, the assumption of exogeneity was discarded for the variables investment activity and birth rate. [15]

14 We are testing the fixed effects model in a comparison with a simple OLS model (least squares estimation) The unrestricted fixed effects model contains one constant and 41 country-specific indicator variables. The restricted OLS contains only the constant. The LR test between the two models examines whether the implicit restriction of the country-specific indicator variables to the value 0 is justified. However, the test results refute this hypothesis. In this context, the fixed effects model seems to be the more convincing alternative.

15 The option “endog” of the Stata command “xtivreg2” was used to test for joint exogeneity for different variable combinations. The endogeneity of birth rate corresponds with empirical findings that were able to determine a correlation between economic development and fertility. See Barro and Lee (1994).

The regression results with respect to the effects of globalization can be interpreted as follows: If the globalization index rises by one point, the growth of the gross domestic product per capita increases by β percentage points, whereby β equals the level of the estimated growth effect of globalization. An illustration: The economic growth per capita is 2.5 percent; the estimator for the effect of globalization is β=0.2. In this case, a rise in the globalization index of one point leads to an increase in economic growth from 2.5 to 2.7 percent. This relationship is constant for all observed countries and for the entire study period.

This knowledge of the sensitivity of economic growth per capita with regard to globalization is used in the next step to quantify the globalization-induced growth gains for the individual countries.

Step 3: Determining the „globalization champion"

The quantification of globalization-induced growth gains involves two steps:

- In the first step, we calculate for each country which growth rates would have resulted from a stagnation in the level of globalization. To this end, annual changes in the globalization index are multiplied by the estimator for the globalization-induced growth effect and subtracted from the historical series of growth rates.

- Starting with the gross domestic product at the beginning of the study period and using the newly calculated growth rates a counterfactual growth trajectory can be constructed for each country that depicts the economic course if the globalization had been stagnant.

The comparison of the historical series of the gross domestic product and those that result from counterfactual growth path enables us to tabulate and compare the globalization-induced growth gains and losses for the individual countries. The "globalization champion" is determined according to the highest globalization-induced gains in income per capita between 1990 and 2011.

2.1.2 Scenarios for future globalization developments

The scenario calculations aim to demonstrate the significance that increasing global interconnectedness may have for future economic developments. To this end, two independent scenarios were devised.

The "accelerated globalization" scenario assumes that globalization will progress at one and a half times the pace of the period from 1990 to 2011. The absolute increase in the speed of globalization should turn out the same for all countries in this scenario. This stipulation has two desirable characteristics. First, it renders the increase in the pace of globalization comparable for all countries. Additionally, a relative alignment is achieved for the globalization speeds: Nations that only managed a comparatively weak expansion of their degree of integration between 1990 and

2011 increase their pace of globalization more strongly in this scenario than those countries with a relatively high speed of globalization. The scenario parameter thus implies a realistic catching-up process for countries that were only able to achieve a rather weak globalization progress over the last two decades.

In the "diverging globalization" scenario, globalization comes to a stop in the euro countries Greece, Portugal and Spain. This scenario demonstrates the hidden risks that result for these countries solely through stagnation of their level of interconnectedness with the rest of the world.

Both scenarios are implemented using the global macroeconomic model VIEW by Prognos (Box 1). Predictions from the Prognos World Report 2013 serve as the starting point for the scenario calculations. These baseline projections play a key role by setting an anchor point as the "most likely scenario" or reference development. It thus constitutes the basis for simulating changes resulting from the scenario parameters. The implicit assumption that the baseline projection is compatible with a "normal globalization development" is justified because no breaks are assumed in the globalization dynamic for this reference development, but rather the most probable courses for all facets of economic development.

Box 1: VIEW, the global economic model by Prognos

VIEW is a comprehensive macroeconomic model. It includes the origin and use of goods and services as well as the labor market and public finances, and systematically connects all participating countries through exports, imports, exchange rates, etc.

This global forecasting and simulation model allows for a consistent and detailed representation of future developments of the global economy. Interactions and feedback between individual countries are captured and modeled explicitly in VIEW. For that reason, its analytical meaningfulness goes far beyond the isolated country models with exogenous defined parameters for the global economic system. In its current version, VIEW includes the 42 most important countries in the world based in terms of economic output – and thus over 90 percent of the global economic output.

On the basis of a set of key exogenous parameters such as demography, the future development of international oil prices or the consolidation rules for national budgets, VIEW generates projections for the global economy and individual countries. Furthermore, VIEW allows for the consideration of a wide range of scenarios. It is for instance possible to capture the consequences an alternative development in one country has for the developments in all remaining countries.

The different globalization developments are simulated through their impacts on foreign trade dynamics. Here the most important variable is the growth rate of the imports of goods. In each scenario this variable is specified in terms of its deviation from the baseline projection according to the conception of the scenario.[16] By contrast, the growth rate of the exports of goods in each scenario results from the changes in imports t and the international trade relationships which are taken into account for in the model.[17] Foreign trade does not just model one of the most significant channels of the effects of globalization on economic development. Because of the detailed representation of bilateral trade relationships in VIEW, foreign trade is optimally suited in the model for representing and analyzing the complex effects of increasing worldwide integration.

The specific implementation of the stipulated development of globalization in each of the scenarios accounts for the historical development of the level of imports and its interaction with the development of the globalization index:

- For the "accelerated globalization" scenario, in a first step the average yearly increase of the globalization index is calculated for all countries between 1990 and 2011. Half of this value constitutes the scenario parameter regarding the absolute acceleration of globalization. This is the same for all countries.[18] To determine its influence on each country's foreign trade, ex-post data is used to determine the change in growth for a country's goods imports. To this end, the average growth rate of the imports of in the ex-post time period is set in relation to the average annual difference of the globalization index and finally multiplied by the scenario parameter for accelerated pace of globalization.

- Parameters for the "diverging globalization" scenario only affect Greece, Portugal and Spain for which globalization is assumed to stagnate. To model this development, the annual growth rates of goods imports for each country are set in relation to the average annual changes in the globalization index. The results in this calculation indicate the degree to which the increasing globalization in each individual country is accompanied by a change in goods imports. Since the scenario aims to model stagnation in the degree of integration and the baseline forecast is assumed to be reconcilable with normal globalization development in a historical context, the scenario parameters for the growth rates of goods imports can be determined as the difference between the growth rates in the baseline forecast and the globalization-related growth rates calculated as described.

16 At this point, we intentionally refrain from exogenizing imports of both goods and services. Contentwise no major differences would be expected in the results for the scenario calculations since imports of goods make up more than 90 percent of total imports for almost every country under consideration. Technically, this approach is imperative because each exogenous implementation requires a modification of the model's logic.

17 A simultaneous exogenization of exports and imports of goods would not be compatible with the international trade networks that are considered in the model. Such an approach would disregard significant features of global economic interconnections and thus not lead to meaningful results.

18 To prevent outliers, the simulated absolute increase of the globalization index is limited to a maximum 200 percent of the increase in the period of time between 1990 and 2011.

2.2 Globalization index: results

This section initially presents the results of the descriptive analysis of the globalization index. Building on that, the regression results are analyzed with regard to the interrelated effects between globalization and growth of the gross domestic product. Finally, a globalization champion is determined based on globalization-induced income gains.

2.2.1 Descriptive analysis of the globalization index

The analysis of the globalization index shows that highly-developed, well-integrated national economies that tend to be smaller exhibit especially high manifestations of the globalization level as Ireland, the Netherlands and Belgium place themselves on the top of the rankings (Table 3).

Table 3: Globalization index for the year 2011

Rank	Country	Globalization index	Rank	Country	Globalization index
1	Ireland	91.00	22	Greece	63.55
2	Netherlands	89.30	23	Slovenia	63.14
3	Belgium	89.00	24	Italy	63.13
4	United Kingdom	82.44	25	Chile	62.37
5	Denmark	80.95	26	Israel	61.87
6	Sweden	79.58	27	Bulgaria	61.69
7	Austria	78.16	28	Poland	60.79
8	Hungary	77.56	29	United States	60.74
9	Switzerland	77.43	30	Latvia	58.47
10	Finland	76.71	31	Romania	56.49
11	Portugal	75.66	32	Lithuania	56.37
12	Estonia	73.89	33	Japan	50.06
13	France	72.98	34	Turkey	48.80
14	Czech Republic	70.78	35	South Africa	48.62
15	Spain	69.70	36	South Korea	47.75
16	Canada	69.29	37	Russia	43.45
17	Germany	69.23	38	Mexico	42.33
18	Slovakia	68.60	39	China	40.19
19	New Zealand	68.56	40	Brazil	40.08
20	Norway	68.03	41	Argentina	34.51
21	Australia	67.13	42	India	32.41

Source: Prognos 2014

In contrast, larger and highly-developed countries such as Germany, France, Italy and Spain rank at mid-table. Noteworthy in this context is the comparatively high position of the United Kingdom. Major developing nations such as China, Brazil and India place themselves mainly toward the bottom of the globalization index. These results are thus comparable with the results of other globalization indices (Box 2).

Box 2: Comparison of the globalization index with the New Globalization Index[19], the Globalization Index of Ernst & Young and the Economic Intelligence Unit (EIU)[20], and the KOF Index of Globalization.[21]

In the comparison of the different globalization indices, index rankings were limited to the list of countries considered in this study (Table 4). At first the comparison reveals many commonalities. Small, highly-developed nations such as the United Kingdom ranked near the top in all indices under consideration. Large and highly-developed national economies such as Germany, France, Italy, Canada and Spain place themselves in the middle of the ranking. In contrast, the United States and Japan are ranked at the bottom end of the midrange in all indices. The last places in the globalization indices are held consistently by major developing nations.

But the comparison of the indices also revealed differences. The average absolute deviation in the ranking positions between the globalization index used in this study and the New Globalization Index amounts to 4.2 places. The corresponding values for the Globalization Index of Ernst & Young/EIU and the KOF Index of Globalization amount to 3.6 and 2.2 places, respectively. The relatively large deviations in the New Globalization Index are due to an older data set from 2005 and due to the fact that all trade flows were weighted with the distance to the individual trade partner for this index. This approach causes global trade to be weighted more heavily than regional trade which improves the ranking position for Argentina and South Africa for example but worsens that of Hungary and the Czech Republic. In regard to the Ernst & Young/EIU index, the differences essentially arise as the result of differences in the indicators considered and the weighting procedure. The Ernst & Young/EIU, e.g., index takes into account the mobility of the labor force which is not the case in the index used for this study. Conversely, the political aspects of globalization are not considered in the index from Ernst & Young/EIU, which places comparatively well-integrated countries such as Austria, Portugal and Turkey at a disadvantage. Deviations from rankings in the KOF Index of Globalization are comparatively small which is not surprising due to the conceptual similarities to the globalization index utilized in this study. Different weighting of the sub-indices mainly results in differences for Estonia, which received a comparatively higher value for the economic sub-index leading to an improved ranking position in the index used here.

19 See Vujakovic (2010).

20 See Ernst & Young (2013). The index from Ernst & Young/EIU is based on a survey of business experts from the year 2012, supplemented by data from government statistics.

21 The ranking from the 2013 KOF Index of Globalization, which was used in this consideration, refers to the year 2010.

Table 4: Differences between the globalization index and other indices with regard to rankings

Rank in the globalization index	Country	New Globalization Index	Ernst & Young, EIU	KOF Index of Globalization
1	Ireland	0	0	–1
2	Netherlands	0	–1	0
3	Belgium	–2	0	1
4	United Kingdom	0	–3	–5
5	Denmark	–2	0	1
6	Sweden	–3	–1	–2
7	Austria	3	–8	5
8	Hungary	–15	1	0
9	Switzerland	5	4	–2
10	Finland	–4	0	–2
11	Portugal	–10	–17	3
12	Estonia	1	–	–10
13	France	1	0	–2
14	Czech Republic	–8	–2	2
15	Spain	–2	–3	1
16	Canada	7	2	5
17	Germany	4	9	–1
18	Slovakia	6	9	3
19	New Zealand	4	1	–4
20	Norway	7	–4	0
21	Australia	3	–1	3
22	Greece	–5	–8	4
23	Slovenia	–3	–	0
24	Italy	3	–4	4
25	Chile	–2	–3	–6
26	Israel	4	8	–2
27	Bulgaria	0	7	–4
28	Poland	0	4	5
29	United States	4	6	2
30	Latvia	–4	–	–2
31	Romania	–11	1	0
32	Lithuania	–	–	3
33	Japan	–6	–2	–3
34	Turkey	–8	–4	2
35	South Africa	9	–5	0
36	South Korea	–2	6	–1
37	Russia	3	–2	3
38	Mexico	2	5	0
39	China	7	2	0
40	Brazil	0	3	0
41	Argentina	8	0	0
42	India	6	0	0

Note: The difference in a country's ranking position is calculated as the country's ranking position in the globalization index used in this study minus the ranking position in the respective comparison index. "–" indicates that the country in question is not considered in the individual index.

Source: Prognos 2014

A glance at the sub-indices gives an indication of how the ranking in the overall index should be evaluated (Table 5). For example, the leading positions of Ireland, the Netherlands and Belgium result from high values in the economic and social sub-indices. But the three front runners also post high values in the political sub-index, even though other countries hold the top places here.

At first, the low globalization index values for major developing nations may seem surprising, but they are reflected consistently in the poor positions for these countries in the economic and social sub-indices.[22] One reason for this result is the normalization of total transaction volumes in the economic sub-index with the size of the respective economy (Box 3).[23]

Box 3: China's position in the globalization index

China ranks 39th in the overall index. This result is largely determined by China's low position in the economic sub-index. What may seem surprising in light of China's importance for the global economy can be explained with a look at China's values for the individual indicators:

First, we need to bear in mind that the economic sub-index not only incorporates transaction volumes, but also other indicators that measure the restrictions on transactions. Due to its restrictive trade policy, China finishes at the end of the set here for all four indicators. This is most pronounced for the capital controls indicator. With 3.0 out of 10 points, China shows the third-lowest value for this indicator among all observed nations. For comparison: Frontrunners in the globalization index like Ireland or the Netherlands exhibit values between 8 and 9 points.

Second, China does not show particularly favorable values for indicators in the "transaction volumes" category in comparison to other national economies. This applies to portfolio investments (10.5 of the gross domestic product and rank 38) as well as foreign direct investments (15 percent of the gross domestic product and rank 42) and trade in services (6 percent of the gross domestic product and rank 39). Even in trade in goods (46 percent of gross national product) China only achieves 29th place among all countries under consideration. One important reason for this finding is that, for the globalization index, the absolute transaction volumes of a country are normalized with the gross domestic product. With respect to trade in goods, China, e.g., ranks in second place behind the United States with an absolute value of over €2.4 billion, which is five times as high as that of Belgium. If we consider these numbers as percentage values in relation to the gross domestic product of the individual nation, Belgium achieves values nearly three times as high as China.

22 To a minor extent this also applies to the political sub-index.

23 Results of empirical research show that methods that place large national economies at less of a "disadvantage" lead to similar results; see, e.g., Vujakovic (2010).

Table 5: Sub-indices of the globalization index for the year 2011

Rank	Country	Economy	Rank	Country	Social	Rank	Country	Politics
1	Ireland	88.36	1	Ireland	99.43	1	Italy	99.75
2	Netherlands	84.97	2	Austria	98.27	2	France	99.48
3	Belgium	82.74	3	Belgium	98.21	3	Belgium	98.57
4	United Kingdom	74.17	4	Switzerland	97.01	4	Spain	97.98
5	Estonia	72.93	5	Netherlands	97.00	5	Austria	97.81
6	Denmark	72.12	6	Canada	96.73	6	United Kingdom	97.11
7	Sweden	71.34	7	Denmark	93.34	7	Sweden	95.89
8	Hungary	69.48	8	France	93.29	8	Brazil	95.72
9	Finland	68.38	9	Portugal	92.87	9	Portugal	95.31
10	Switzerland	65.24	10	United Kingdom	92.56	10	Denmark	95.03
11	Austria	64.90	11	Czech Republic	90.13	11	Canada	95.03
12	Portugal	63.37	12	Norway	89.48	12	Netherlands	94.57
13	New Zealand	61.21	13	Germany	88.94	13	Switzerland	94.45
14	Czech Republic	59.04	14	Slovakia	88.72	14	Argentina	94.40
15	France	57.37	15	Sweden	87.99	15	Turkey	94.00
16	Chile	56.81	16	Spain	87.92	16	Germany	93.33
17	Slovakia	56.43	17	Finland	87.57	17	India	92.81
18	Latvia	55.09	18	Hungary	86.94	18	United States	92.81
19	Bulgaria	54.76	19	Greece	86.74	19	Norway	92.76
20	Germany	54.63	20	Australia	85.98	20	Greece	92.63
21	Spain	54.19	21	Poland	82.55	21	Hungary	92.43
22	Australia	52.65	22	United States	81.98	22	Australia	91.74
23	Norway	52.64	23	Italy	80.09	23	Romania	91.44
24	Slovenia	51.74	24	Estonia	79.29	24	Poland	91.20
25	Canada	51.56	25	Slovenia	78.00	25	Finland	90.86
26	Lithuania	51.44	26	New Zealand	77.40	26	Ireland	90.51
27	Israel	50.39	27	Israel	76.66	27	Chile	89.93
28	Greece	46.13	28	Latvia	73.74	28	South Korea	89.78
29	Italy	45.27	29	Romania	70.50	29	Japan	89.64
30	Poland	43.40	30	Russia	70.49	30	South Africa	87.68
31	United States	42.97	31	Lithuania	70.27	31	Czech Republic	86.67
32	Romania	40.18	32	Japan	67.63	32	China	85.46
33	South Africa	36.26	33	Turkey	67.33	33	Russia	85.13
34	South Korea	34.93	34	Bulgaria	60.14	34	Slovakia	84.98
35	Mexico	31.08	35	Chile	51.49	35	Bulgaria	84.04
36	Japan	31.01	36	Mexico	48.70	36	Slovenia	82.48
37	Turkey	27.56	37	China	48.11	37	New Zealand	81.75
38	China	23.65	38	Argentina	47.93	38	Israel	81.39
39	Brazil	22.15	39	South Africa	46.61	39	Estonia	71.36
40	Russia	20.54	40	South Korea	44.20	40	Mexico	69.74
41	India	14.12	41	Brazil	38.24	41	Lithuania	57.23
42	Argentina	10.07	42	India	26.89	42	Latvia	53.34

Source: Prognos 2014

Highly-developed national economies that place themselves at mid-table of the overall index take on leading positions in the political sub-index. This applies in particular to Italy, France and Spain, and to a lesser extent to Germany. In the social sub-index and particularly in the economic sub-index, these countries rank mostly at mid-table. In particular, Germany, despite being a global export champion for a long time, only achieves middle-of-the-road ranking throughout. Germany's distance from the pack leaders, as measured in index points, is especially significant in the economic sub-index.

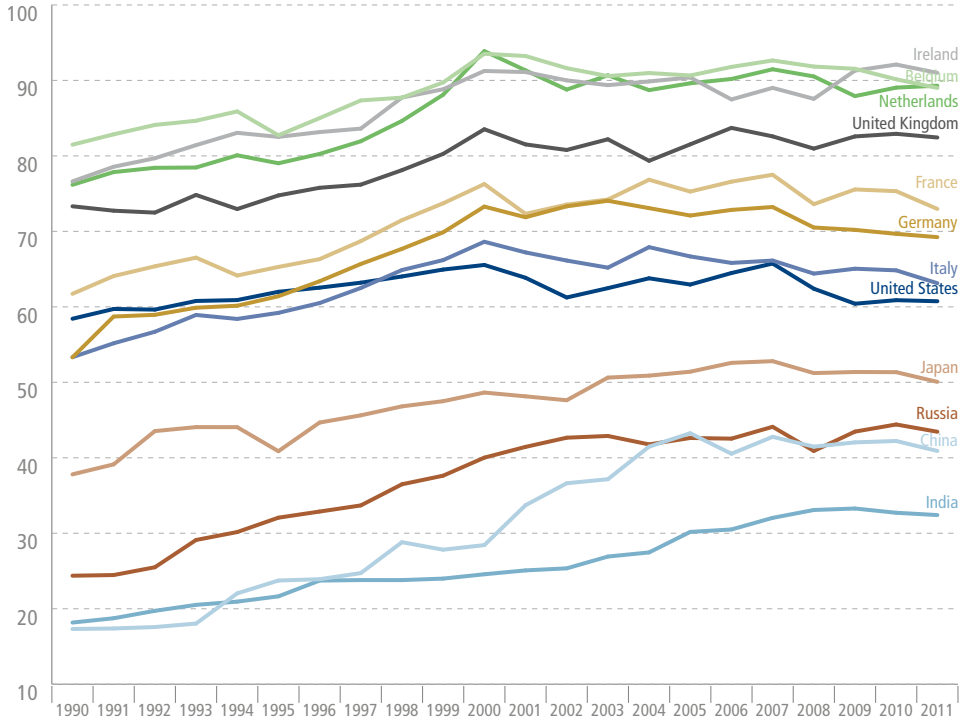
To be able to better classify a few sub-aspects of these results, it is illustrative to visualize the country-specific differences for a few indicators. However, when interpreting the manifestations of the individual indicators, we must keep in mind that high or low values are not necessarily associated with an implicit value judgment. However, as a gauge for sub-aspects of the integration of individual countries with the rest of the world, they hold decisive explanatory power for the ranking in the overall index or the sub-indices.

For example, Germany's relatively low value on the globalization index can at least be partially explained by scale effects. In 2011, the total of exports and imports of goods was around €2 billion and therefore four times as high as that of Belgium. This order is reversed when viewed in relation to the gross domestic product: Belgium imported and exported goods at a value of around 128 percent of its economic output. This degree of openness is around 77 percent for Germany. Similar relationships exist for other economic indicators as well.

A further reason for the leading positions of Ireland, the Netherlands and Belgium and Germany's comparatively poor performance lies in geographic circumstances and financial market structures. For example, the Netherlands and Belgium have very high foreign trade levels partly because of their well-developed port infrastructures. By contrast, Ireland exhibits an astronomical 1,300 percent in portfolio investments in relation to its gross domestic product. Ireland also occupies a leading position in foreign direct investment, which is nearly 261 percent of its gross domestic product. By comparison, Germany merely displays values of 143 and 60 percent, respectively, in these areas. In the same context, the United Kingdom's high figure in the economic sub-index reveals that it benefits in this ranking from London as a strong financial center.

A look at the development of the globalization index since the year 1990 shows that the rankings have only experienced minor changes over the last 21 years (Figure 1, Table 28 through Table 32 in Appendix A). While, as expected, an upward trend in the index is observed for most countries, it is relatively consistent across countries. The countries at the top of the ranking, Ireland, the Netherlands and Belgium have remained unchanged since the beginning of the study period. The same applies to the rankings of developing nations, although they are showing signs of catching up slightly.

Figure 1: Manifestations of the globalization index for selected countries from 1990 to 2011



Source: Prognos 2014

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With this we can state that, particularly smaller but highly-developed national economies are among the most globalized countries in the world. These countries owe their ranking in part to their economic indicator figures, which are high in relation to economic output. With the exception of the United Kingdom, the European core states occupy places in the middle range, an outcome essentially caused by the moderate values of the economic indicators and further strengthened by the heavy weighting of this sub-index. The major developing nations form the group at the bottom of the globalization index, but exhibit greater dynamics over time.

2.2.2 Regression analyses on the relationship between globalization and economic growth

The following discussion of the regression results for the growth effects of globalization focuses on our baseline specification (Table 6, Column 2). In addition to the globalization index as the main explanatory variable, this specification includes the gross domestic product per capita, the birth rate, investments and a crisis indicator for the years 2008 and 2009 as control variables.[24]

Table 6: Regression results regarding the determinants of economic growth per capita

Dependent variable: Growth of the gross domestic product per capita as a percent	IV method with FE	IV method with FE and country groups
Total globalization	0.35***	–
	(0.07)	
Globalization for		
Large national economies with a high per capita income	–	0.26***
		(0.05)
Small national economies with a high per capita income	–	0.26***
		(0.06)
Large national economies with a low per capita income	–	0.29
		(0.16)
Small national economies with a low per capita income	–	0.40***
		(0.10)
Gross domestic product per capita in the next-to-last period (logarithmized)	–10.48***	–10.02***
	(1.60)	(1.70)
Birth rate (logarithmized)	–10.44***	–10.19**
	(2.42)	(3.26)
Investments (as a % of the gross domestic product)	0.15	0.12
	(0.10)	(0.10)
Crisis indicator 2008—009	–3.55***	–3.59***
	(0.43)	(0.43)
Number of observations	840	840
R^2 (centered)	0.40	0.40

Notes: The symbols *, **, *** indicate the significance of the estimation results for the 10%, 5% and 1% levels. Standard errors are clustered by country and displayed in parentheses. All regressions contain a constant. FE is the abbreviation for country-specific fixed effects.

Source: Prognos 2014

The results verify that globalization has a significantly positive influence on gross domestic product per capita growth. The estimated coefficient of 0.35 indicates that an increase of the globalization index by one point on average leads to an increase in growth rate of the gross domestic product per capita by 0.35 percentage points. This, e.g., suggests that with an average rise in the globalization index of 0.76 points per year between 1990 and 2011, Germany owes 0.27

24 The selection of variables for the baseline specification is based largely on the significance of the effects on growth of these determinants as indicated by the results. Additionally, the two endogenous control variables – investments and fertility – are included to enable comparable results across all specifications..

percentage points of its annual per capita growth to its increasing interconnectedness with the rest of the world.

This figure equals almost 20 percent of the average growth of the gross domestic product per capita in the same period of time, which signals the decisive importance that can be attributed to globalization alongside other drivers of growth such as technological progress.

The other estimated results of the baseline specification show the expected signs. The gross domestic product per capita, the birth rate and the indicator for the most recent global economic crisis are included with minus signs in the estimation equation. Also, all of them are statistically significant. A coefficient of -10.48 for the influence of economic output means that a 1 percent increase in the gross domestic product per capita leads to a reduction of per capita growth of 0.105 percentage points two years later. Similarly for fertility, a 1 percent increase corresponds to a 0.105 percentage point decline in growth per capita. The estimated 3.55 coefficient for the crisis years 2008 and 2009 signifies that the economic growth per capita during this period was approximately 3.5 percentage points lower than in the rest of the observation period. At 0.15, the estimated value for investments in relation to the gross domestic product also exhibits the expected sign, but is not statistically significant.[25]

The reliability of estimated results is checked using a variety of alternative regression specifications. As the first alternative, we consider a specification in which the growth effect of globalization is estimated separately for different country groups, but in which the same explanatory variables are taken into account. To this end, the countries under consideration are separated into four groups of approximately equal size based on the gross domestic product per capita in the year 1990 and the size of the economy, as measured by the gross domestic product of the same year (Table 7).[26]

The results demonstrate that all four country groups exhibit similar sensitivities in per capita growth with regard to globalization (Table 6, Column 3). At 0,40, small national economies with a low gross domestic product per capita show a slightly greater sensitivity in economic growth with regard to globalization, while all other country groups display a slightly lower sensitivity. Differences between the estimators are too small to allow meaningful interpretations, as none of the estimators differ significantly from 0.35.[27]

25 Estimators that do not signal a statistically significant effect of investments on the gross domestic product are not uncommon in the empirical literature. See Dreher (2006) and Borys, Polgár, & Zlate (2008).

26 The division was performed as follows: First, all countries being studied were separated into two groups according to a median split with respect to the gross domestic product per capita in the year 1990. This figure amounted to €10,050. Next, the country groups formed in this way were each divided into two sub-groups based on the median split according to the gross domestic product in the year 1990. This figure amounted to €250 billion for the group of countries with a high gross domestic product per capita and €95 billion for the group of countries with a low gross domestic product per capita.

27 The lowest p-value for the two-sided t-test resulted with a value of 0.06 for the group of large national economies with a high gross domestic product per capita. The next lowest value, 0.15, resulted for the group of small national economies with a low gross domestic product. Therefore, the null hypothesis that that the estimated sensitivity in per capita growth with respect to globalization corresponds to a value of 0.35 can only be rejected for the group of large national economies with a high gross domestic product per capita and also only at a significance level of 10 percent.

This result signals that alternative specifications with country-group-specific estimators for the growth effects of globalization do not come to meaningfully different conclusions. Furthermore, the estimated coefficients of the remaining explanatory variables hardly differ from those of the baseline specification.

Table 7: Classification of the national economies under consideration based on the gross domestic product per capita and the size of the economy

Large national economies with a high per capita income	Small national economies with a high per capita income	Large national economies with a low per capita income	Small national economies with a low per capita income
Australia	Belgium	Argentina	Bulgaria
Germany	Denmark	Brazil	Chile
France	Finland	China	Estonia
Italy	Greece	India	Latvia
Japan	Ireland	Mexico	Lithuania
Canada	Israel	Poland	Romania
Netherlands	New Zealand	Portugal	Slovakia
Switzerland	Norway	Russia	Slovenia
Spain	Austria	South Africa	Czech Republic
United States	Sweden	South Korea	Hungary
United Kingdom		Turkey	

Source: Prognos 2014

As alternative specifications, additional regressions with different combinations of explanatory variables were run using both the baseline specification as well as the specification with country-group-specific sensitivities as starting points.[28] Results of these regressions corroborate the finding that both the estimated effects of globalization on growth as well as those of the remaining explanatory variables are robust and can be considered reliable (Table 33 and Table 34 in Appendix A).[29]

The overall result of the regression analyses documents the stable and significant positive influence of globalization on per capita growth. In particular, the high reliability of the estimations strengthens the confidence in the regression results. For that reason, the estimated sensitivity of per capita growth in the baseline specification of 0.35 percentage points for each point of the globalization index can be considered a key interim result of this section. The „globalization champion" will be determined in the next section based on this sensitivity.

28 Furthermore, the terms of trade were taken into account in additional regressions as a control variable for the relation of export to import prices. The results across all specifications exhibit a positive, but insignificant influence of the terms of trade on economic growth and no change of the estimated effect of globalization on growth.

29 Moreover, all explanatory variables are included in the estimation equation with the expected signs. The only exception is secondary education, for which the estimated effect turns out to be negative although the estimator fails to reach statistical significance at a conventional level.

2.3 Growth effects of globalization

This section aims to answer the question regarding the extent to which the countries under consideration have benefited from the ongoing globalization in the time period from 1990 to 2011. This analysis is based on the comparison of the historical development of the gross domestic product with a counterfactual scenario for which globalization is assumed to have stagnated at the level prevailing at the outset of the observation period. In other words: We assume in the scenario that the globalization index in all the years from 1991 to 2011 remained fixed at the 1990 level for the each country.[30] We use the differences in the development of the gross domestic product per capita, summed up over the entire observation period, as the basis for measuring globalization gains. When interpreting the results, we must distinguish between economic growth and cumulative income gains (Box 4).

The country whose residents have benefited the most from increasing globalization will be crowned the „globalization champion." In accordance with the economics focus of the study, both the absolute income gains per capita and the per capita income gains weighted according to purchasing power are used as two alternative indicators to determine the "globalization champion."

For a differentiated representation of the results with regard to the different starting positions and proportions of the national economies, we utilized the globalization-induced income gains per capita in relation to the value of the gross domestic product in the year 1990 as well as the aggregated income gains of the entire national economy. In order to also convey an impression of the extent to which global integration tendencies are associated with changes in the distribution of net household income, we subsequently compare the globalization-induced income gains with the changes in the Gini coefficients for the individual countries.

Box 4: Interpreting the globalization-induced income gains as an indicator for determining the „globalization champion"

The assumed stagnation of globalization causes low economic growth and thus an unfavorable growth path. The yearly difference between the level of the gross domestic product per capita according to this alternative path and the actual development shows the absolute economic gains (Figure 2).

30 The development of the gross domestic product per capita is calculated with the following formula for the counterfactual scenario:

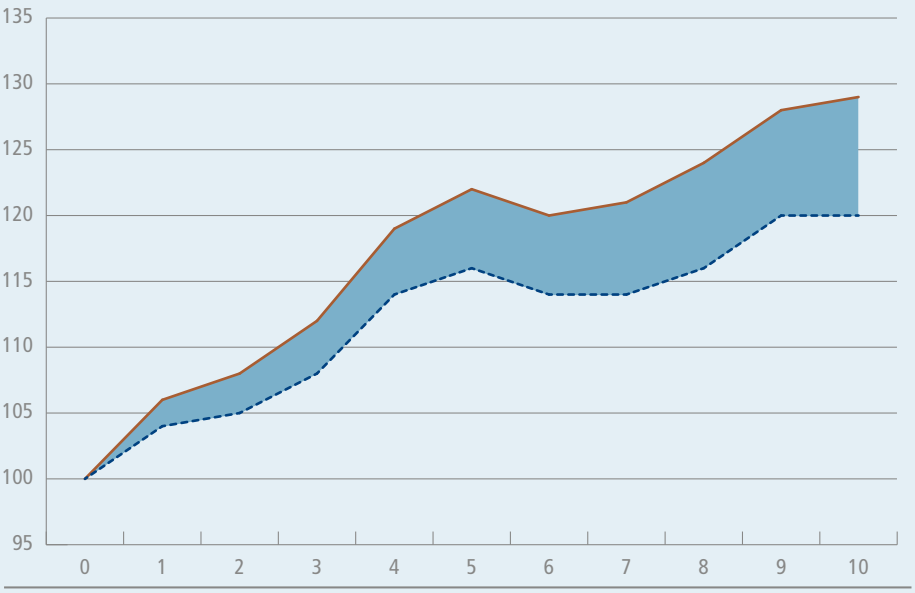
$$\frac{BIP_t}{POP_t} = \frac{BIP_{1990}}{POP_{1990}} * \prod_{k=1991}^{t} \left(1 + \frac{g_k - 0{,}35 * (GI_k - GI_{k-1})}{100}\right)$$

In this formula, gt represents the given historical growth rate of the gross domestic product per capita in percent, POPt the population in year t and GIt the value of the globalization index in year t. Subsequently the gross domestic product itself is determined through multiplication of the gross domestic product per capita with the given historical population figures.

These gains for each country under consideration are summed up for the entire time period of 1990 to 2011 as a measure for the cumulative effects of globalization. In this study, the variable calculated in this way will be designated as the "cumulative income gain induced by progressing globalization." This variable should not be confused with variables that are used in the system of national accounts, such as the available income.

Furthermore, we must distinguish between cumulative income gains and changed growth rates. For example, even a one-time higher growth rate of the gross domestic product induces income gains that accumulate over the remaining study period, even when growth rates in the remaining time frame remain unchanged. By contrast, a one-time globalization-related income gain has no implications for the growth rate in the following years.

Figure 2: Schematic representation of the development of the gross domestic product and globalization-induced income gains



Source: Prognos 2014

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2.3.1 Determining the „globalization champion" based on income gains per capita

Considering the absolute income gains per capita resulting from increasing globalization, we see that two Scandinavian nations occupy the first two places in the ranking (Table 8).[31] According to this approach, Finland is the "globalization champion", followed by Denmark. With Switzerland, Austria, Greece, Ireland and Sweden, five additional small European countries rank among the top ten. But some large national economies including Germany and Japan report large income gains per capita as well and, thus, can count themselves among the stronger beneficiaries of the globalization process.

Places 11 through 24 are occupied primarily by Central European countries or national economies with a gross domestic product per capita that is high in comparison with the rest of the world. Slovenia, South Korea and Estonia are exceptions here. It is noteworthy that residents of large industrial nations do not benefit equally from the increasing interconnectedness in the world. Globalization gains per capita in the United Kingdom and United States are less than half as high as those for Germany, for example. Countries like Italy, Canada and Spain fall under this category as well. Reasons for this finding can be mainly found in the different developments of the globalization index. Germany benefits on the one hand in that it was able to post the greatest growth in the globalization index between 1990 and 2011 among the mentioned countries under (Table 28 through Table 32 in Appendix A).

Equally important is the fact that Germany's progress with regard to integration with the rest of the world can be primarily attributed to the first half of the observation period. In comparison to many other national economies, globalization-related income gains in Germany were therefore able to accumulate over a longer period of time.

The lower mid-range of globalization winners is completed primarily by nations from Eastern Europe and the Baltic states. While these national economies were only able to achieve from 20 to 30 percent of the frontrunners' globalization gains per capita, this can still be considered an impressive success especially in light of the economic turmoil after the fall of the Soviet Union.

The large developing nations rank last in the comparison of absolute globalization gains per capita. Therefore, in terms of absolute cumulative income gains per capita, they do not count to the strong beneficiaries of globalization, despite their significance for the world economy e which is due to their large domestic markets and highly dynamic economies.

31 To correctly classify the results, it is important to note that this study does not allow any statements with regard to the income distribution within a country. The stated income gains induced by progressing globalization refer exclusively to the average of the population.

Table 8: Absolute income gains per capita as the result of increasing globalization in the period of time from 1990 to 2011

Rank	Country	Average annual per capita income gain since 1990 in euros*	Cumulative per capita income gain since 1990 in euros*
1	Finland	1,500	31,400
2	Denmark	1,420	29,800
3	Japan	1,400	29,500
4	Germany	1,240	26,100
5	Switzerland	1,220	25,600
6	Israel	1,080	22,600
7	Austria	1,010	21,300
8	Greece	980	20,500
9	Ireland	970	20,400
10	Sweden	970	20,300
11	Slovenia	900	18,900
12	Netherlands	890	18,700
13	France	800	16,900
14	Portugal	800	16,800
15	South Korea	790	16,500
16	Australia	750	15,800
17	Italy	710	15,000
18	Canada	660	13,800
19	New Zealand	650	13,700
20	Belgium	630	13,200
21	United Kingdom	580	12,100
22	Spain	570	11,900
23	Estonia	560	11,700
24	United States	540	11,300
25	Hungary	410	8,600
26	Latvia	350	7,300
27	Lithuania	330	7,000
28	Chile	300	6,400
29	Norway	300	6,300
30	Czech Republic	300	6,300
31	Slovakia	270	5,700
32	Poland	260	5,500
33	Argentina	230	4,900
34	Turkey	190	4,000
35	Romania	170	3,600
36	South Africa	160	3,400
37	Bulgaria	160	3,400
38	Brazil	120	2,600
39	Russia	120	2,500
40	Mexico	100	2,200
41	China	80	1,700
42	India	20	400

* real prices from the year 2000; rounded values

Source: Prognos 2014

Another important finding emerges for those countries that exhibit the highest values for the globalization index: Neither Belgium, the Netherlands nor Ireland are among the top-ranked countries in terms of globalization gains per capita. The reason for this result is that, although these national economies have a high degree of integration with the rest of the world, they exhibited low momentum during the study period. This result clearly shows the importance of ongoing efforts to integrate national economies with the rest of the world, even for – or perhaps especially for – very globalized nations.

Observing the development over time sheds additional light on how the globalization-induced income gains per capita should be assessed (Figure 4 through Figure 7 in Appendix B). It shows that the strongest gains in terms of growth should be attributed to the period from the mid-1990s to the middle of the first decade of the 21st century. "Globalization champion" Finland and the other main beneficiaries from globalization were able to increase their gross domestic product per capita through globalization at the beginning of the study period. This makes clear how important the developments in the early years of the observation period are for the overall results of this study: The earlier a country was able to benefit from globalization, the longer the period of time during which the income gains per capita could be accumulated. The boom in technology and the important role of the Finnish telecommunications industry in the 1990s may therefore be decisive factors in the final ranking of the beneficiaries from globalization. By contrast, the selection of the observation period puts countries such as Chile or Slovakia, which were only able to achieve significant increases in the globalization index in the later on, at a disadvantage.

To what extend the situation has improved due to the ongoing globalization depends not only on the absolute income gains, but most notably on the level of consumption that individuals can afford as a result. For this reason, we analyzed income gains per capita that have been weighted according to purchasing power as an alternative way to determine the „globalization champion" (Table 9).

According to this approach, Finland, again, takes the leading position. However, the rankings after Finland show some changes in comparison to the previous approach. Slovenia, which came in 12th place in the absolute globalization-induced income gains, and 11th-place holder Greece take second and third place in this ranking. Japan, on the other hand, finds itself ranked 16th here, due to its high price levels, and Sweden only takes 17th place. Similar logic applies for the United Kingdom and the United States, which drop eight and nine places, respectively.

Table 9: Per capita income gains induced by increasing globalization in the period of time from 1990 to 2011, adjusted for purchasing power

Rank	Country	Average annual per capita income gain in euros, APP*	Cumulative per capita income gain in euros, APP*
1	Finland	1,630	34,300
2	Slovenia	1,570	33,000
3	Greece	1,570	32,900
4	Germany	1,400	29,300
5	Denmark	1,360	28,600
6	Estonia	1,330	27,900
7	Israel	1,280	26,800
8	Portugal	1,240	26,100
9	Austria	1,220	25,700
10	South Korea	1,190	25,000
11	Switzerland	1,110	23,300
12	Ireland	1,100	23,000
13	Netherlands	1,080	22,700
14	Hungary	1,080	22,600
15	New Zealand	1,030	21,600
16	Japan	980	20,500
17	Sweden	970	20,300
18	Italy	950	19,900
19	France	930	19,500
20	Australia	910	19,100
21	Lithuania	870	18,300
22	Latvia	840	17,700
23	Spain	830	17,500
24	Czech Republic	810	17,100
25	Canada	800	16,700
26	Belgium	770	16,100
27	Bulgaria	630	13,300
28	Poland	620	13,100
29	United Kingdom	600	12,600
30	Romania	590	12,400
31	Chile	580	12,200
32	Slovakia	560	11,700
33	United States	540	11,300
34	Russia	450	9,500
35	Turkey	410	8,700
36	South Africa	370	7,700
37	Norway	290	6,100
38	Argentina	280	5,800
39	Brazil	230	4,900
40	China	200	4,100
41	Mexico	170	3,500
42	India	60	1,200

* adjusted for purchasing power in relation to the United States; real prices from the year 2000; rounded values

Source: Prognos 2014

These shifts in rankings are partially due to considerable changes in the reported income gains. While Finland's purchasing power parity adjusted income gains per capita amount to about €3,000 and are therefore 10 percent higher than the absolute unadjusted income gains per capita, the changes for Greece amount to about €12,500 (or 60 percent), for Slovenia to about €14,000 (or 75 percent), and for Estonia to about €16,000 (or 140 percent). The major developing countries are also better off in the approach in which the purchasing power is taken into account. Among the latter, Russia exhibits the largest jump with an increase of €7,000 or 280 percent.

Despite major shifts in the rankings for individual countries, the overall picture described previously remains largely unchanged. The first positions are primarily occupied by smaller countries with a high gross domestic product per capita. With the exception of Germany, the large industrialized nations find themselves exclusively at mid-table. The positions in the middle of the ranking are completed by Eastern European nations. Without exception, the major developing countries occupy places at the bottom of the ranking.

2.3.2 Globalization-induced income gains per capita in relation to the starting level

If we analyze the per capita income gains in relation to value of the gross domestic product per capita in 1990, we see strong shifts in the country rankings (Table 10). National economies that exhibited a low to medium level for the gross domestic product per capita in 1990 take on a top position in this approach – with China leading the way.

Smaller and midsized Eastern European economies as well as the Baltic states, especially Estonia and Slovenia, earn places in the upper third of the ranking. The majority of smaller national economies with a high gross domestic product per capita occupy ranks in the middle of the field. By contrast, Sweden, Switzerland, Belgium and particularly Norway find themselves at the lower end of the ranking. At just about one percent, Norway's cumulative globalization-induced income gain per capita in relation to the value of the gross domestic product per capita in 1990 turns out around 18 times smaller than China's, and about seven times smaller than that of its neighbor Finland.

Germany takes the highest rank in the ranking among the highly developed industrial nations with 17th place. Spain, France and Italy rank in the lower midrange. Results for the United Kingdom and United States are especially noteworthy. Their positions at the lower end of the ranking are the result of relatively low absolute income gains, which were further put into perspective by the high baseline level of the gross domestic product per capita.

Table 10: Per capita income gains resulting from globalization from 1990 to 2011 in relation to the gross domestic product per capita in the year 1990

Rank	Country	Average annual per capita income gain in relation to the gross domestic product per capita in the year 1990 as a percent	Cumulative per capita income gain in relation to the gross domestic product per capita in the year 1990 as a percent
1	China	18.5	388
2	Estonia	11.3	238
3	South Korea	10.5	220
4	Slovenia	9.9	208
5	Greece	9.3	194
6	Bulgaria	8.8	186
7	Chile	8.7	184
8	Hungary	8.7	182
9	Portugal	8.4	176
10	Romania	8.3	175
11	Latvia	8.1	171
12	Poland	7.8	164
13	Lithuania	7.1	149
14	Finland	6.9	145
15	Israel	6.5	136
16	Ireland	6.3	133
17	Germany	5.8	122
18	Denmark	5.4	114
19	New Zealand	5.2	108
20	Czech Republic	5.1	107
21	Turkey	5.0	105
22	India	5.0	105
23	Austria	4.9	102
24	South Africa	4.8	100
25	Slovakia	4.7	98
26	Spain	4.6	96
27	Netherlands	4.3	91
28	Russia	4.2	87
29	France	4.0	83
30	Italy	3.9	83
31	Australia	3.9	83
32	Argentina	3.8	80
33	Sweden	3.8	79
34	Japan	3.8	79
35	Brazil	3.4	70
36	Switzerland	3.3	69
37	Canada	3.1	65
38	Belgium	3.1	65
39	United Kingdom	2.7	58
40	Mexico	1.7	37
41	United States	1.7	36
42	Norway	1.0	21

Source: Prognos 2014

Among the major developing nations, only China occupies a position at the top of the ranking. In contrast to China, the larger absolute per capita income gains of other developing nations are overcompensated by higher values of the gross domestic product per capita in 1990. For this reason, Russia finds itself in the lower midrange while Argentina, Brazil and Mexico occupy places toward the bottom of the ranking. India's position in the middle of the field is the result of having the lowest absolute per capita income gain among all countries under consideration, combined with the likewise lowest level of gross domestic product per capita in the first year of the observation period.

2.3.3 Globalization-induced income gains at the country level

If we consider the globalization-induced income gains at the country level, we note, not surprisingly, that exclusively large national economies are represented at the top of the ranking (Table 11). Japan takes first place with an average yearly income gain of about €180 billion induced by increasing globalization. Therefore, Japan's gains over the entire study period add up to considerably more than €3 trillion, or around 68 percent of the gross domestic product of the year 2011. The globalization gains of the United States, Germany and China also represent impressive sums. Germany's income gain over the period of time between 1990 and 2011 equals around 92 percent of its gross domestic product in the year 2011 – which is more than the Federal Republic's national debt at this point in time.

But some smaller countries also report considerable globalization gains in relation to their individual economic output. Estonia's cumulative globalization-induced income gain amounts to more than 160 percent of its gross domestic product in 2011. Likewise, countries such as Latvia, Lithuania, Bulgaria, Slovenia, Romania, Hungary, Finland, Portugal and Greece were able to achieve globalization gains which correspond to more than 100 percent of their gross domestic product.

The sequence of globalization gains at the country level largely coincides with public perception since, at an aggregated level, the large national economies are the strongest beneficiaries from increasing global integration. The fact that, contrary to common belief, the major developing nations, China and India, do not rank in first and second on this list might be due to two reasons: First, the specification of the observation period puts both countries at a disadvantage since the calculations of the absolute income gains are based on the low starting values of the gross domestic product in 1990. Thus, China and India's process of catching up based on double-digit growth rates for the gross domestic product in each in the subsequent years is not taken into account. Second, it cannot be ruled out that the estimation procedure which estimates a single globalization-induced growth effect for all countries under consideration cannot do justice to all of China and India's unique characteristics.

Table 11: Average and cumulative globalization-induced income gains at the country level in the time period between 1990 and 2011

Rank	Country	Average annual income gain since 1990 in billions of euros*	Cumulative income gain since 1990 in billions of euros*	Cumulative income gain since 1990 in relation to the real gross domestic product of 2011**
1	Japan	178.7	3,752	68
2	United States	154.8	3,251	24
3	China	103.0	2,163	56
4	Germany	102.0	2,142	92
5	France	50.3	1,057	64
6	Italy	41.4	870	70
7	South Korea	37.7	792	88
8	United Kingdom	34.8	730	38
9	Spain	24.1	506	65
10	Brazil	22.3	468	46
11	Canada	20.9	438	45
12	India	19.6	412	36
13	Russia	17.0	356	75
14	Australia	15.2	319	51
15	Netherlands	14.4	303	63
16	Turkey	12.5	262	57
17	Mexico	11.4	240	26
18	Greece	10.8	226	147
19	Poland	10.1	212	74
20	Switzerland	9.0	188	56
21	Sweden	8.8	184	54
22	Argentina	8.7	182	35
23	Portugal	8.3	175	130
24	Austria	8.3	174	70
25	Finland	7.8	164	102
26	South Africa	7.8	163	77
27	Denmark	7.7	161	86
28	Israel	7.4	156	80
29	Belgium	6.6	138	47
30	Chile	5.0	105	79
31	Hungary	4.1	87	140
32	Ireland	4.0	84	60
33	Romania	3.8	79	126
34	Czech Republic	3.1	65	72
35	New Zealand	2.6	55	77
36	Slovenia	1.8	38	133
37	Slovakia	1.5	31	60
38	Norway	1.4	29	13
39	Bulgaria	1.2	26	123
40	Lithuania	1.1	24	117
41	Latvia	0.8	17	130
42	Estonia	0.8	16	166

* real prices from the year 2000; rounded values; ** in percent

Source: Prognos 2014

2.3.4 Overall globalization gains in comparison to the overall gross domestic product

In light of the previously discussed findings, it is apparent that there are other sources for growth in the observed countries aside from globalization. A comparison of the globalization-induced income gains with the overall growth of the gross domestic product between 1990 and 2011 makes this even clearer (Table 35 and 36 in Appendix A).

While, for some countries, more than half the income gains are associated with developments related to globalization, the percentage of globalization-induced income gains comprise less than 5 percent of the total growth of economic output for other countries.[32] The reasons for these discrepancies must be sought in the specific situation of the individual countries.

For example, for many European countries the creation of an integrated domestic market was of great importance. The large developing countries presumably benefit from dynamic domestic markets and the diffusion of technology from industrial nations. Natural resources play an important role for countries like Norway. A comprehensive discussion of country-specific sources for growth would require detailed country analyses, which are not part of this study.

2.3.5 Income gains per capita in relation to changes in income distribution

The results of the previous analyses express predominantly positive overall economic effects from globalization. They do not answer to what extent globalization-induced growth at the country level is also reflected in an improved economic situation for individuals. Some critics of globalization hold the view that ongoing global integration is associated with increasing income inequality. The following analyses aim to reveal the degree to which this prediction aligns with the results of this study.

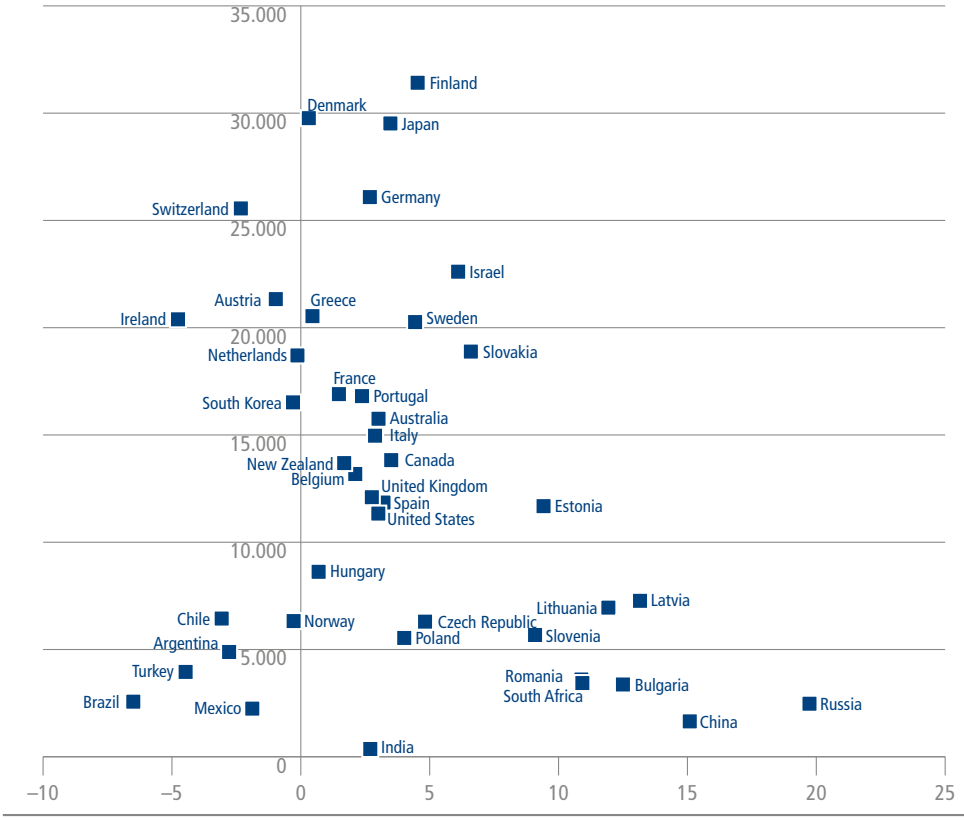
We use the Gini coefficient for net income as an indicator for the inequality of income distribution within a country.[33] The coefficient can take on values between 0 and 100. A score of 0 means that all households in a country have the same net income. Higher values signal greater inequality. The top value of 100 would result if one single household were to possess the entire net income of the country.

32 At this place we must point out that the design of scenario calculations is based on an estimator that is uniform for all countries with regard to the effects of globalization on growth. This approach brings advantages regarding the comparability of globalization gains; however, country-specific characteristics cannot be fully taken into consideration. To that extent, the resulting globalization gains in relation to the total development of the gross domestic product should be seen as estimates. They do not satisfy the complex challenges of a country-specific growth accounting.

33 The Gini coefficient of the SWIID Version 4.0 (Standardized World Income Inequality Database) data set is used in this study, see Solt (2009). This data set is characterized by good data availability regarding both the number of available countries as well as the observed time periods.

An initial indication that globalization does not lead to greater income inequality arises from the correlation between the Gini coefficient and a country's value in the globalization index. The correlation amounts to 0.52 (p=0.00)[34] across all countries and years under consideration, demonstrating that more heavily globalized countries tend to exhibit a more even income distribution. This finding is strengthened further if we consider the correlation between the globalization-induced income gains per capita and the development of the Gini coefficient between the years 1990 and 2011 (Figure 3).

Figure 3: Scatterplot of absolute globalization-induced income gains per capita in relation to the difference of the Gini coefficients between 1990 and 2011



Source: Prognos 2014

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34 A p-value of below 0.05 (0.01) means that the statistics are distinct from zero with a probability of more than 95 percent (99 percent).

First it is noticeable that in a number of countries the distribution of net household income became more even while at the same time the countries enjoyed large gains from globalization. This applies both to developing nations such as Brazil and Mexico and to European economies such as Ireland or Austria. By contrast, globalization-induced income gains were associated with greater inequality in net household income especially in Eastern European countries. However, despite large income gains due to increasing globalization, the majority of countries being studied exhibited only a small increase of the Gini coefficient.

Overall, Figure 3 gives the impression that larger globalization-induced income gains per capita tend to be associated with smaller Gini coefficient increases. This finding is confirmed if we calculate the correlation between the annual globalization gains and the annual difference in the Gini coefficients. The correlation amounts to −0.13 (p=0.00).[35]

With regard to the correlation analyses, it can be summarized that that, based on the approach of this study, no negative relationship between progressing globalization and the inequality of the distribution of net household income within individual countries could be ascertained.

Regression analysis can provide a more in-depth look at the connection between globalization and the distribution of income, with the Gini coefficient serving as a dependent variable. The key explanatory variable is the degree of economic, political and social integration with the world, operationalized by the globalization index. In the regressions, we additionally control for other variables that influence the distribution of income (Table 12). These are:

- Technological progress: Technological progress leads to greater demand for skilled labor. At the same time, demand for low-skilled workers declines. Such a development can lead to higher wages for skilled labor and lower wages for unskilled labor, which in turn leads to broader disparity in household income.

- Access to education: If access to education improves, a greater percentage of the labor force can be employed in more highly qualified areas as a result. Therefore, better education tends to promote equality in net household incomes.

- Composition of the employment structure: Wage levels often depend on the sector of the job. For example, a higher percentage of employees in the agricultural sector – where wages are comparatively low – can be associated with greater distribution inequality.

By contrast, a higher percentage of women in the workforce may lead to smaller income disparities because the net income is more equally distributed across all households.

35 This result confirms itself as robust for other indicators as well. The correlation coefficients between income gains that have been adjusted for purchasing power (or alternatively the income gains in relation to the starting level) and the difference of the Gini coefficients between 1990 to 2011 amount to -0.16 (p=0.00) and -0.15 (p=0.00), respectively.

Table 12: Variables that potentially influence the distribution of income as control variables for the regression analyses

Variables affecting income distribution	Control variables	Source
Globalization	Globalization index	Prognos
Technological progress	Solow residual. (Calculation: Change rate of the gross domestic product minus the sum of the change rates for the production factors Work and Capital, weighted with the income percentages	Prognos; basic data: OECD and EU-Ameco
Technological progress	Number of patents (at the European or US patent office)	OECD Science and Technology Indicators
Education	Percentage of the population that completed secondary education or higher	Barro and Lee (2013); Version 1.3
Education	Average number of school years	Barro and Lee (2013); Version 1.3
Composition of labor force	Percentage of employees in the agriculture sector (as a % of the entire labor force)	World Bank, World Development Indicators, 2013
Composition of labor force	Percentage of employees in the industrial sector (as a % of the entire labor force)	World Bank, World Development Indicators, 2013
Composition of labor force	Percentage of employed women (as a % of the entire labor force)	World Bank, World Development Indicators, 2013

Source: Prognos 2014

A panel approach with fixed effects for countries and years is employed as a regression model. It is estimated using ordinary least squares. The country-specific effects control for time-constant, unobserved heterogeneity among countries. The year-specific effects serve to statistically capture the effects of global macroeconomic shocks.[36]

The regression results show two specifications of the estimation equation, each with different operationalization of technological progress (Table 13). According to both regressions, globalization has a positive, but insignificant effect on the Gini coefficient across all countries. The positive coefficient suggests that globalization tends to increase inequality. However, the coefficient's lack of statistical significance indicates that the result could be coincidental. Therefore, the results cannot be interpreted as evidence for such a correlation.

Technological progress exhibits the expected positive coefficients when measured by the Solow residual as well by the number of patent applications. A lack of statistical significance reveals, however, that results regarding this determinant should be interpreted with caution.

36 For similar empirical approaches, see International Monetary Fund (2007), Chapter 4 or OECD (2011), Chapter 2.

The remaining control variables predominantly exhibit the expected signs, but the estimated coefficients do not always prove to be significant. Therefore, better education – measured by the average length of school enrollment – is associated with decreasing inequality of net household income. The percentage of people employed in agriculture tends to have an inequality-increasing effect, although the estimated coefficient is not statistically significant. As expected, a higher percentage of employed women is associated with a smaller disparity in net household income.

Table 13: Regression results with respect to the determinants of the distribution of income

Dependent variable: Logarithm of the Gini coefficient	(1)	(2)
Globalization index	0.0018	0.0021
	(0.0013)	(0.0014)
Technological progress measured via		
Solow residual	0.0033	
	(0.0025)	
Number of patents (at the European or US patent office)		0.0012
		(0.0099)
Percentage of the population that completed secondary education or higher	0.0035*	0.0014
	(0.0017)	(0.0020)
Average number of school years	–0.4454***	–0.2858*
	(0.1345)	(0.1402)
Percentage of employees in the agriculture sector (as a % of the entire labor force)	0.0501	0.0447
	(0.0352)	(0.0350)
Percentage of employees in the industrial sector (as a % of the entire labor force)	–0.0053	–0.0180
	(0.0579)	(0.0620)
Percentage of employed women (as a % of the entire labor force)	–0.8276***	–0.5273**
	(0.2190)	(0.1995)
Fixed effects for countries	Ja	Ja
Dummy variables for years	Ja	Ja
Number of observations	620	872
R^2 (centered)	0.37	0.32

Notes: The symbols *, **, *** indicate the significance of the estimation results for the 10%, 5% and 1% levels. Standard errors are clustered by country and displayed in parentheses. All regressions contain a constant. With the exception of the percentage of the population that completed secondary education or higher, all other variables use logarithmized values. The different numbers of observations trace back to data availability.

Source: Prognos 2014

Thus, while the regression analysis does suggest that a higher worldwide degree of integration measured through the globalization index tends to be linked with a larger disparity in net household income, this finding is limited by the fact that the associated regression results do not exhibit a conventionally required level of significance. For this reason, an interpretation of the estimation results should be interpreted with caution: This study was not able to confirm a connection between globalization and the development of the distribution of income.

2.4 Future globalization development scenarios

2.4.1 Results of the "Accelerated globalization" scenario

Compared to the baseline scenario, the model specification for the "accelerated globalization" scenario yields differences for the growth rates of imports and exports that vary widely between nations (Table 14). Here neither the growth rates of foreign trade components nor the course of development in the globalization index for the ex-post time period is decisive on its own; what is key, instead, is their interaction. For example, the Baltic states exhibited import growth rates of at least 6.7 percent per year between 1990 and 2011. At the same time, the 1.4 point average annual increase of the globalization index came out relatively high compared to other world countries. As a difference to the baseline forecast, how strong the import growth turns out in relation to the increase in the globalization index is crucial for the scenario parameters, since imports are exogenized through a specification in the model.

The hereby exemplified Baltic States exhibit an import growth between 4.7 to 6.1 percent for each globalization point. Within the scenario and accounting for a uniform yearly increase of the globalization index amounting to 0.40 points[37], this corresponds, in comparison to the baseline projection, to an additional import growth that falls in the middle range of all countries. Nations like Argentina, Brazil and India, by contrast, demonstrate high growth rates for imports combined with a low globalization dynamic in the ex-post period of time, which leads to high growth parameters for imports in this scenario in comparison to the baseline forecast. The lowest growth specifications for imports and consequently the low growth rates for exports in this scenario occur for countries like Belgium, Portugal and a few Eastern European countries that exhibit low growth rates for imports in relation to the annual increase of the globalization index.

If we consider growth rates of the gross domestic product that result for different periods of time based on the simulation calculations, we initially notice that all the countries being studied could benefit from accelerated globalization (Table 15). In light of the consideration that higher trade volumes are conducive to greater specialization of individual economies and thus further promote their comparative advantages, this should not come as a surprise.

Based on the fact that the parameters change for all the countries in this scenario, the following must be taken into consideration when interpreting results for individual countries:

37 This corresponds to 50 percent of the average annual increase of the globalization index for all countries in the period of time from 1990 to 2011; see Section 2.1.2. The restriction that the simulated additional increase of the globalization index may amount to a maximum of 100 percent in relation to the average annual difference of the index for the individual country between 1990 and 2011 affects Argentina, Belgium, Mexico, Norway and the United States. The simulated increase of globalization for these countries amounts to 0.18 points, 0.36 points, 0.33 points, 0.02 points and 0.11 points.

Table 14: Average export and import growth: differences between the "accelerated globalization" scenario and the baseline forecast

Country	Imports		Exports	
	2020	2025	2020	2025
Argentina	8.77	8.88	9.36	9.49
Australia	2.58	2.62	2.76	2.51
Belgium	0.98	1.00	0.97	0.98
Brazil	4.53	4.55	5.55	5.37
Bulgaria	0.97	1.01	1.12	1.15
Chile	2.31	2.34	2.49	2.52
China	4.58	4.62	4.27	4.29
Denmark	1.70	1.78	1.64	1.75
Germany	2.01	2.04	1.89	1.92
Estonia	2.33	2.34	2.36	2.39
Finland	1.53	1.57	1.61	1.64
France	2.05	2.07	2.13	2.17
Greece	1.11	1.16	1.39	1.49
India	6.99	7.03	7.45	6.92
Ireland	2.35	2.66	2.18	2.33
Israel	1.57	1.60	1.73	1.84
Italy	2.20	2.24	1.95	2.00
Japan	2.13	2.17	2.29	2.23
Canada	3.81	3.91	3.89	3.94
Latvia	2.10	2.18	2.37	2.45
Lithuania	1.88	1.89	2.00	2.04
Mexico	4.91	4.94	5.07	5.12
New Zealand	1.59	1.65	1.66	1.72
Netherlands	2.08	2.12	1.95	2.01
Norway	1.34	1.38	1.04	1.09
Austria	2.16	2.20	2.10	2.17
Poland	2.71	2.73	2.66	2.68
Portugal	0.69	0.72	0.87	0.92
Romania	0.84	0.88	1.01	1.06
Russia	1.29	1.32	1.33	1.47
Sweden	3.05	3.12	2.80	2.90
Switzerland	3.72	3.80	3.22	3.34
Slovakia	1.49	1.48	1.37	1.38
Slovenia	1.24	1.26	1.23	1.27
Spain	2.66	2.73	2.53	2.63
South Africa	1.86	1.89	2.17	2.31
South Korea	2.75	2.75	2.52	2.50
Czech Republic	1.74	1.75	1.67	1.71
Turkey	4.55	4.58	5.65	5.60
Hungary	1.33	1.34	1.37	1.41
United States	4.40	4.46	5.11	4.91
United Kingdom	2.65	2.75	2.90	3.10

Source: Prognos 2014

Table 15: Economic growth: differences between the "accelerated globalization" scenario and the baseline forecast

Country	Difference between the average economic growth and the baseline forecast in percentage points	
	2014 to 2020	2014 to 2025
Argentina	0,11	0,22
Australia	0,12	0,24
Belgium	0,08	0,13
Brazil	0,06	0,13
Bulgaria	0,46	0,76
Chile	0,27	0,69
China	0,42	0,54
Denmark	0,10	0,32
Germany	0,31	0,40
Estonia	0,72	0,94
Finland	0,33	0,48
France	0,05	0,16
Greece	0,19	0,56
India	0,45	0,42
Ireland	0,62	0,35
Israel	0,23	0,57
Italy	0,05	0,14
Japan	0,08	0,32
Canada	0,09	0,29
Latvia	0,12	0,73
Lithuania	0,54	0,80
Mexico	0,20	0,14
New Zealand	0,21	0,46
Netherlands	0,22	0,30
Norway	0,02	0,11
Austria	0,28	0,46
Poland	0,41	0,54
Portugal	0,40	0,61
Romania	0,19	0,60
Russia	0,24	0,56
Sweden	0,19	0,33
Switzerland	0,18	0,35
Slovakia	0,35	0,44
Slovenia	0,35	0,61
Spain	0,14	0,30
South Africa	0,09	0,53
South Korea	0,47	0,42
Czech Republic	0,40	0,59
Turkey	0,10	0,16
Hungary	0,44	0,58
United States	0,04	0,12
United Kingdom	0,21	0,56

Source: Prognos 2014

Precise statements regarding the causes of differences in the gross domestic product between the scenario and the reference development are only possible to a certain extent, because it is very difficult to distinguish whether country-specific deviations between the scenario and the baseline forecast are directly attributable to certain parameters or whether they are caused by complex interactions between various countries.

It can be generally observed that the growth advantages resulting from the simulation differ by country. The greatest differences relative to the baseline projection are found primarily in Eastern European countries. Presumably this is largely due to the high degree of openness of these countries in the starting year of the simulation calculations and due to the importance of the contribution of foreign trade to their economic development. For example, Estonia's relatively moderate increase in imports and exports, when combined with a degree of openness that exceeds 200 percent, leads to trade growth that reaches significant magnitudes in relation to the gross domestic product.

Even with a degree of openness below 100 percent, nations such as China and India also achieve growth increases of around a half a percentage point over the baseline projection. This relatively strong increase in comparison to other countries results among other things from the high parameter value for additional import growth in the scenario. As nations that post the lowest degree of openness of all the countries under consideration – a maximum of 52 percent – Argentina, Brazil, Turkey and the United States show that strong growth rate increases for imports and exports do not necessarily lead to high additional growth rates for the gross domestic product.

When accounting for a more favorable economic development relative to the baseline projection, all countries yield income gains.(Table 16). If we first take a first look at income gains at the country level, we observe that China would see a cumulative benefit from accelerated globalization of around €2.7 billion by the year 2025. Other major national economies such as Germany, India, Japan, the United States and the United Kingdom would also enjoy cumulative income gains of over €500 billion according to the simulation results. Gains for Australia, France, Italy and Spain come in rather low by comparison.

In order to mask out pure scale effects, we additionally consider the per capita income gains. This approach reveals that highly-developed nations tend to have particularly strong gains. Accordingly, eight European nations are represented among the top ten places. A look at Asia with the per capita approach also yields a different picture. Here, accelerated globalization benefits South Korea significantly more than China. However, the example of China is not the only one showing that developing nations fall toward the end of the ranking in the per capita consideration. In Brazil and India the cumulative per capita income gains from accelerated globalization are even lower.

Table 16: Cumulative income gains in a comparison between the "accelerated globalization" scenario and the baseline forecast in the time period from 2014 to 2025

Country	Cumulative income gain in billions of euros*	Cumulative per capita income gain in the scenario in euros*	Cumulative per capita income gain in euros*, weighted according to purchasing power in the scenario	Cumulative per capita income gain in relation to the gross domestic product in the year 2013 as a percent
Argentina	96	2,058	2,439	15
Australia	98	3,843	4,651	14
Belgium	25	2,127	2,591	8
Brazil	120	550	1,045	10
Bulgaria	12	1,844	7,267	60
Chile	69	3,685	6,973	43
China	2,700	1,932	4,817	58
Denmark	31	5,296	5,091	16
Germany	795	9,793	10,993	34
Estonia	9	7,155	17,062	92
Finland	57	10,252	11,184	35
France	129	1,871	2,163	8
Greece	40	3,505	5,611	28
India	791	581	1,969	56
Ireland	75	15,535	17,530	49
Israel	84	9,621	11,394	36
Italy	91	1,438	1,910	7
Japan	726	5,822	4,045	13
Canada	129	3,413	4,115	12
Latvia	5	2,714	6,610	38
Lithuania	16	5,469	14,420	74
Mexico	160	1,266	1,963	16
New Zealand	23	4,801	7,584	27
Netherlands	115	6,644	8,080	23
Norway	12	2,171	2,093	5
Austria	81	9,292	11,203	31
Poland	129	3,388	7,997	45
Portugal	58	5,477	8,497	47
Romania	18	874	2,998	30
Russia	181	1,282	4,934	36
Sweden	82	8,051	8,075	22
Switzerland	75	8,703	7,938	20
Slovakia	14	2,582	5,331	38
Slovenia	12	5,793	10,125	44
Spain	132	2,741	4,053	17
South Africa	72	1,484	3,331	31
South Korea	510	10,113	15,327	53
Czech Republic	40	3,766	10,226	45
Turkey	67	759	1,678	12
Hungary	30	3,114	8,145	51
United States	861	2,485	2,485	6
United Kingdom	582	8,705	9,046	29

* real prices from the year 2000; rounded values; ** weighted according to purchasing power in relation to the United States

Source: Prognos 2014

However, due to differing wealth levels of the countries being studied, absolute income gains are only somewhat suitable for assessing wealth developments. Cumulative per capita income gains in relation to the per capita gross domestic product (in the starting year of scenario calculations) would be a more informative alternative. This demonstrates that developing nations like China and India benefit significantly more from accelerated globalization relatively speaking than the absolute per capita income gain would lead us to believe. Conversely, we see that income gains of highly-developed nations such as Norway are lower when placed in relation to the respective country's level of the per capita gross domestic product.

An intensification of global trade would also yield positive effects on the individual labor markets (Table 17). The general trend shows that greater economic growth brought about by accelerated globalization leads to stronger reductions in the unemployment rate. This applies for instance to the Baltic states as well as Bulgaria, Chile and the United Kingdom. By contrast, national economies such as Argentina, Brazil and Mexico exhibit only mildly positive effects in their labor markets, which is not surprising in light of the small differences in economic growth between the scenario and baseline projection.

For some countries, the input ratio between the production factors labor and capital also plays a role in the effects on the unemployment rate. Thus, labor markets in highly-developed countries such as Germany, Italy, France, Austria and the United Kingdom can scarcely benefit from accelerated globalization. Conversely, India demonstrates a strong reduction in the unemployment rate despite relatively moderate effects of trade intensification on economic growth. That this correlation does not apply to all countries is emphasized by the example of China.

In summary, we can determine that accelerated globalization could promote a more favorable worldwide economic development in the future. However, due to the number and complexity of scenario parameters, the simulation only allows limited conclusions with regard to country-specific differences.

2.4.2 Results of the "Diverging globalization" scenario

The "diverging globalization" scenario analyzes the effects of a stagnating globalization in Greece, Portugal and Spain within the context of the problems these countries are currently facing. First, the scenario parametrization yields a modified growth rates for imports and exports (Table 18).[38]In this approach, we see that global trade volumes in the scenario result overall lower than in the baseline forecast. Not surprisingly, the three directly affected countries have to accept the greatest declines in the growth of foreign trade components compared to the baseline projection.

38 The scenario parameters are based on changes in the globalization index of 1.2 points for Greece, 1.3 points for Portugal and 0.5 points for Spain.

Table 17: Difference in the unemployment rate in a comparison between the "accelerated globalization" scenario and the baseline forecast in the years 2020 and 2025

Country	Difference in the unemployment rate between the scenario and the baseline forecast in percentage points	
	2020	2025
Argentina	–0.14	–0.29
Australia	–0.31	–0.45
Belgium	–0.09	–0.21
Brazil	–0.03	–0.06
Bulgaria	–0.46	–1.05
Chile	–0.21	–0.98
China	–0.32	–0.21
Denmark	–0.10	–0.23
Germany	–0.17	–0.13
Estonia	–0.52	–0.71
Finland	–0.61	–1.17
France	–0.10	–0.37
Greece	–0.19	–0.77
India	–0.62	–1.10
Ireland	–0.28	–0.04
Israel	–0.12	–0.36
Italy	–0.04	–0.14
Japan	0.00	–0.07
Canada	–0.10	–0.51
Latvia	–0.12	–1.17
Lithuania	–0.46	–0.98
Mexico	–0.06	–0.02
New Zealand	–0.45	–1.55
Netherlands	–0.10	–0.11
Norway	–0.11	–0.42
Austria	–0.11	–0.15
Poland	–0.34	–0.39
Portugal	–0.26	–0.56
Romania	–0.19	–0.74
Russia	–0.11	–0.37
Sweden	–0.26	–0.53
Switzerland	–0.19	–0.34
Slovakia	–0.24	–0.37
Slovenia	–0.41	–0.68
Spain	–0.28	–1.05
South Africa	–0.05	–0.89
South Korea	–0.44	–0.55
Czech Republic	–0.27	–0.43
Turkey	–0.06	–0.09
Hungary	–0.27	–0.48
United States	–0.06	–0.27
United Kingdom	–0.47	–1.58

Source: Prognos 2014

But all the other countries also exhibit lower export and import growth rates in the scenario relative to the reference development. Italy and Bulgaria are particularly affected since they suffer from the weakness of key export customers. For example, the majority of Italian exports flow to Europe: Germany and France alone buy around one quarter of Italy's exports. In turn, this scenario depicts Bulgaria as suffering most notably from the weakness of Italy and Greece. Around one quarter of Bulgaria's exports go to these two countries.

The relative reduction of global trade in the scenario results in lower economic growth for all the economies being analyzed (Table 19). In the countries directly affected by stagnating globalization, the difference between their economic growth and their development in the baseline projection emerges as particularly high, at around 1 percentage point. It is striking that the declines in growth for Portugal are similar in value to those in Spain and Greece, even though the reduction in foreign trade growth in the latter two countries is almost twice as high as for Portugal.

One reason for this observation lies in Portugal's heavy dependence on foreign trade with its neighbor, Spain. Around one quarter of all Portuguese exports flow to Spain, and nearly one third of its imports come from its Spanish neighbor. Therefore, Spain's weakness represents a significant risk and an additional burden for Portugal's economic development.

Though declines in growth are less observable in countries not directly affected, they are still considerable in absolute terms. In addition to the countries addressed at the beginning of this section, Italy and Bulgaria, significant reductions in economic growth occur for other central European nations such as France and Germany as well. By comparison, major developing nations and countries that are located at great geographical distance from the directly affected countries have far fewer adverse effects to worry about.

In some cases considerable cumulative income losses result from the change in growth rates (Table 20). From the country level perspective, we see that aside from the directly affected countries, the greatest losses primarily impact the large national economies. In a negative sense, the United States and Germany are the frontrunners here. However, we must keep in mind that the results are primarily driven by size effects, whereby even small changes in economic growth lead to large gains or losses in absolute income.

Instead, if we consider the cumulative income differences per capita, the greatest income losses emerge in countries directly affected by stagnating globalization, followed by European countries with a high gross domestic product per capita.

Lower cumulative per capita income losses result for countries with a comparatively low per capita gross domestic product– this applies essentially to the major developing nations. This result is put into perspective quantitatively (but not qualitatively) if we consider income gains that have been weighted according to purchasing power.

Table 18: Average export and import growth: differences between the "diverging globalization" scenario and the baseline forecast

Country	Imports		Exports	
	2020	2025	2020	2025
Argentina	–0.06	–0.06	–0.15	–0.11
Australia	–0.07	–0.05	–0.18	–0.07
Belgium	–0.16	–0.10	–0.17	–0.10
Brazil	–0.05	–0.05	–0.14	–0.09
Bulgaria	–0.27	–0.24	–0.33	–0.26
Chile	–0.12	–0.11	–0.16	–0.12
China	–0.04	–0.04	–0.07	–0.07
Denmark	–0.19	–0.12	–0.22	–0.12
Germany	–0.25	–0.17	–0.30	–0.18
Estonia	–0.27	–0.15	–0.27	–0.15
Finland	–0.17	–0.11	–0.20	–0.11
France	–0.26	–0.21	–0.38	–0.26
Greece	–3.22	–3.26	–3.99	–3.91
India	–0.02	–0.01	–0.03	–0.01
Ireland	–0.15	–0.08	–0.17	–0.09
Israel	–0.05	–0.04	–0.06	–0.04
Italy	–0.31	–0.25	–0.36	–0.25
Japan	–0.07	–0.06	–0.10	–0.01
Canada	–0.13	–0.05	–0.15	–0.03
Latvia	–0.22	–0.11	–0.22	–0.11
Lithuania	–0.19	–0.11	–0.19	–0.10
Mexico	–0.02	–0.02	–0.03	–0.02
New Zealand	–0.05	–0.03	–0.07	–0.02
Netherlands	–0.21	–0.14	–0.23	–0.14
Norway	–0.15	–0.09	–0.15	–0.08
Austria	–0.21	–0.12	–0.22	–0.10
Poland	–0.25	–0.17	–0.25	–0.16
Portugal	–2.19	–2.20	–2.51	–2.37
Romania	–0.24	–0.20	–0.27	–0.20
Russia	–0.09	–0.09	–0.15	–0.11
Sweden	–0.12	–0.08	–0.12	–0.07
Switzerland	–0.14	–0.10	–0.15	–0.09
Slovakia	–0.25	–0.14	–0.25	–0.14
Slovenia	–0.18	–0.12	–0.18	–0.11
Spain	–3.10	–3.16	–3.37	–3.42
South Africa	–0.02	–0.01	–0.02	0.00
South Korea	–0.09	–0.04	–0.09	–0.04
Czech Republic	–0.27	–0.14	–0.27	–0.13
Turkey	–0.07	–0.06	–0.11	–0.08
Hungary	–0.22	–0.12	–0.23	–0.12
United States	–0.06	–0.07	–0.15	–0.12
United Kingdom	–0.13	–0.12	–0.18	–0.13

Source: Prognos 2014

Table 19: Economic growth: differences between the "diverging globalization" scenario and the baseline forecast

Country	Difference between the average economic growth and the baseline forecast, in percentage points	
	2014 to 2020	2014 to 2025
Argentina	–0.08	–0.08
Australia	–0.08	–0.06
Belgium	–0.13	–0.09
Brazil	–0.06	–0.05
Bulgaria	–0.33	–0.30
Chile	–0.12	–0.11
China	–0.05	–0.05
Denmark	–0.18	–0.13
Germany	–0.21	–0.17
Estonia	–0.22	–0.15
Finland	–0.16	–0.12
France	–0.20	–0.18
Greece	–0.63	–0.96
India	–0.02	–0.02
Ireland	–0.10	–0.07
Israel	–0.04	–0.04
Italy	–0.26	–0.22
Japan	–0.07	–0.07
Canada	–0.11	–0.06
Latvia	–0.19	–0.11
Lithuania	–0.14	–0.10
Mexico	–0.02	–0.02
New Zealand	–0.05	–0.03
Netherlands	–0.16	–0.13
Norway	–0.13	–0.08
Austria	–0.20	–0.13
Poland	–0.23	–0.18
Portugal	–1.07	–1.14
Romania	–0.23	–0.22
Russia	–0.10	–0.10
Sweden	–0.09	–0.07
Switzerland	–0.10	–0.08
Slovakia	–0.23	–0.15
Slovenia	–0.15	–0.12
Spain	–0.78	–1.10
South Africa	–0.02	–0.01
South Korea	–0.07	–0.04
Czech Republic	–0.25	–0.15
Turkey	–0.06	–0.06
Hungary	–0.15	–0.11
United States	–0.06	–0.07
United Kingdom	–0.11	–0.11

Source: Prognos 2014

The result that European countries are particularly affected by a stagnating globalization is reinforced when we use the cumulative per capita income gains in relation to the starting level of the gross domestic product per capita in the year 2013 as a measure for the effects of stagnating globalization in Europe's crisis-stricken countries. The three directly affected countries register cumulative income losses between 63 and around 103 percent of the gross domestic product per capita in the starting year of the scenario calculation. With the exception of Bulgaria, this indicator is no more than 24 percent in all the other national economies being studied. Losses are especially low in this approach for the major developing nations and countries that have only minor trade relationships with Greece, Portugal and Spain, such as South Africa, Israel and New Zealand.

The decrease in economic growth resulting from the simulated stagnating globalization in Greece, Portugal and Spain also has an impact on labor markets (Table 21). The unemployment rate attains especially high levels in the directly affected countries. Spain would feel the heaviest impact, with its already high unemployment rate in the year 2025 increasing a further 3.6 percentage points from the almost 19 percent in the baseline projection. At 1.2 and 0.9 percentage points respectively, the increasing unemployment rate results lower for Greece and Portugal; however, this still reflects an increase of around 10 percent in relation to the projected unemployment rate of the baseline forecast in 2025. Moderate increases in the unemployment rate emerge for countries not directly affected, but tend to be greater for nations with strong trade relationships with Greece, Portugal or Spain.

Overall, the simulation of stagnating globalization in Greece, Portugal and Spain and the resulting effects on foreign trade demonstrate that the entire global economy would have to cope with an array of negative consequences. The adverse economic effects are distributed differently worldwide in that context. Strong negative effects emerge for the significant trade partners of the directly affected countries. Conversely, large and geographically distant economies that depend little on trade with Greece, Portugal or Spain are affected slightly, if scarcely at all.

Table 20: Cumulative income gains in a comparison between the "diverging globalization" scenario and the baseline forecast in the time period from 2014 to 2025

Country	Cumulative income gain in billions of euros*	Cumulative per capita income gain in the scenario, in euros*	Cumulative per capita income gain weighted according to purchasing power in the scenario, in euros*	Cumulative per capita income gain in relation to the gross domestic product in the year 2013, as a percent
Argentina	–54	–1,178	–1,396	–9
Australia	–41	–1,624	–1,965	–6
Belgium	–37	–3,185	–3,880	–12
Brazil	–82	–380	–722	–7
Bulgaria	–7	–1,071	–4,222	–35
Chile	–20	–1,066	–2,017	–12
China	–275	–197	–491	–6
Denmark	–32	–5,544	–5,329	–17
Germany	–495	–6,090	–6,836	–21
Estonia	–2	–1,883	–4,490	–24
Finland	–23	–4,177	–4,557	–14
France	–317	–4,641	–5,364	–19
Greece	–90	–7,784	–12,463	–63
India	–31	–22	–76	–2
Ireland	–14	–2,932	–3,309	–9
Israel	–8	–985	–1,166	–4
Italy	–282	–4,473	–5,941	–23
Japan	–346	–2,765	–1,921	–6
Canada	–94	–2,535	–3,056	–9
Latvia	–3	–1,440	–3,507	–20
Lithuania	–3	–1,178	–3,106	–16
Mexico	–18	–144	–222	–2
New Zealand	–3	–688	–1,087	–4
Netherlands	–77	–4,471	–5,437	–16
Norway	–29	–5,305	–5,115	–12
Austria	–47	–5,479	–6,606	–18
Poland	–65	–1,700	–4,014	–22
Portugal	–128	–12,020	–18,647	–103
Romania	–13	–616	–2,112	–21
Russia	–52	–367	–1,413	–10
Sweden	–32	–3,197	–3,206	–9
Switzerland	–31	–3,671	–3,349	–9
Slovakia	–8	–1,472	–3,039	–22
Slovenia	–4	–1,894	–3,310	–14
Spain	–592	–12,298	–18,184	–77
South Africa	–4	–91	–204	–2
South Korea	–72	–1,420	–2,152	–7
Czech Republic	–21	–2,000	–5,430	–24
Turkey	–35	–394	–871	–6
Hungary	–9	–956	–2,501	–16
United States	–834	–2,439	–2,439	–6
United Kingdom	–204	–3,079	–3,199	–10

* real prices from the year 2000; rounded values; ** weighted according to purchasing power in relation to the United States

Source: Prognos 2014

Table 21: Unemployment rate in a comparison between the "diverging globalization" scenario and the baseline forecast

Country	Difference in the unemployment rate between the scenario and the baseline forecast in percentage points	
	2020	2025
Argentina	0.08	0.08
Australia	0.07	0.00
Belgium	0.14	0.13
Brazil	0.02	0.02
Bulgaria	0.26	0.26
Chile	0.13	0.18
China	0.15	0.14
Denmark	0.17	0.07
Germany	0.06	0.02
Estonia	0.05	0.01
Finland	0.27	0.19
France	0.26	0.26
Greece	0.63	1.17
India	0.03	0.04
Ireland	0.05	0.01
Israel	0.02	0.02
Italy	0.34	0.24
Japan	0.01	0.01
Canada	0.12	0.05
Latvia	0.12	0.04
Lithuania	0.09	0.06
Mexico	0.01	0.00
New Zealand	0.10	0.08
Netherlands	0.10	0.07
Norway	0.07	0.02
Austria	0.21	0.17
Poland	0.11	0.05
Portugal	0.70	0.89
Romania	0.24	0.26
Russia	0.06	0.07
Sweden	0.09	0.07
Switzerland	0.12	0.08
Slovakia	0.13	0.06
Slovenia	0.15	0.06
Spain	1.78	3.57
South Africa	0.02	0.04
South Korea	0.07	0.07
Czech Republic	0.08	0.01
Turkey	0.03	0.03
Hungary	0.06	0.04
United States	0.13	0.17
United Kingdom	0.19	0.20

Source: Prognos 2014

3 The most appealing foreign markets

The above study showed which countries have benefited most from globalization over the last time period of approximately 20 years. Scenario calculations based on the globalization-champion approach have equally highlighted the opportunities as well as risks that arise from deviating from the previous globalization path. The study demonstrated the extent to which each country is affected with regards to changes in growth rates and income variables.

For the German economy, the study revealed significant gains. However, this finding is, in a certain sense, relatively abstract: The measured globalization gains are a statistical result of the interplay of countless individual decisions taken by companies, private households and the government. Therefore, an appeal to utilize the potential of globalization can only be addressed at individual actors and not at an economy as a whole.

In order to seize the available opportunities, it is important for businesses to focus on the right foreign markets. The term “right” refers to being able to achieve consistent income gains at company level with foreign activities – and thereby aggregated gains at an overall economic level. Precisely in this sense, we use the Prognos Free Trade and Investment Index to measure and rank the attractiveness of foreign markets from a German perspective.

As such, the recorded indicators for measuring market attractiveness go beyond the aspects of market size or market dynamics and emphasize aspects such as the reliability of framework conditions. The ranking determined here may deviate significantly from that in the globalization index: Not all countries that are particularly well globalized offer equally attractive markets from a German perspective. However, the correlation between the two indices is high.[39]

39 The correlation of the rankings in the Free Trade and Investment Index and the globalization index amounts to 0.69. In index values, the correlation even reaches a value of 0.75. This demonstrates the high degree of compatibility/agreement between the two measures. Total correlation would be achieved at a value of 1. The deviation from a perfect correlation results from the differing thematic orientation of both indices. For example, the Free Trade and Investment Index evaluates the market size in the sense of the gross domestic product as positive for the attractiveness of the individual country. In the globalization index, economic indicators are normalized with the market size of the individual country to prevent distortions of a country’s measured degree of integration with the rest of the world through variable effects.

3.1 Focus and methodology of the Prognos Free Trade and Investment Index

The Prognos Free Trade and Investment Index comprehensively covers the relevant success factors for foreign activities with a broad spectrum of economic, institutional and sociopolitical indicators. Its presentation as a ranking also enables a clear comparison of countries with each other. Statements about which countries and regions are better suited for German foreign activities than others are central findings of the Prognos Free Trade and Investment Index. On the one hand, it identifies the market appeal of key trade partners for Germany and traces this appeal and its key determinants; on the other, it facilitates the identification of foreign markets whose appeal for German entities is still largely underestimated.

In order to take a variety of issues into account, the Prognos Free Trade and Investment Index encompasses four individual rankings according to current state, dynamic trends, exports and foreign direct investments as well as an overall ranking:

- The “current state” ranking portrays the current appeal of foreign markets.
- The ranking “dynamic trends” demonstrates, in a comparison to the “current state”, which markets have gained the most appeal in previous years and how dynamically these markets will develop in the future, independent of their starting level.
- The two rankings “exports” and “foreign direct investments” take different types of foreign activities into consideration. The first ranking shows which countries have the greatest export potential, while the second ranking highlights which countries would lend themselves well for German companies to initiate or expand direct investments in.
- The overall ranking consolidates the current state and dynamic trends. This, on the one hand, takes into account that a market – even a potential one – is especially attractive only if it already exhibits an appreciable level of appeal in the present. On the other hand, it ensures that the attractiveness measurement is not backward -looking: It should emphasize markets that have strong attractiveness prospects for the future. Under these circumstances, the “current state” ranking is clearly more heavily weighted in the overall ranking than the “dynamic trend” ranking. Thus the overall ranking measures the appeal of foreign markets from the perspective of German businesses in the most comprehensive sense.

Comprehensive knowledge about country-specific circumstances is necessary in order to perform a suitable assessment of the opportunities and risks of foreign activities. Detailed information about the individual markets as well as overall economic features and institutional and sociopolitical characteristics are particularly relevant here.

The Prognos Free Trade and Investment Index takes this into account because it is based on a variety of key location factors of foreign markets and therefore provides crucial starting points for estimating the success of foreign activities. 33 individual indicators are compiled into nine sub-indices, thereby enabling an extensive description of export and investment conditions in the national economies being analyzed (Table 22).[40]

The individual indicators are partly obtained from internationally recognized indices. These include the Human Development Index, the Corruption Perception Index, the Ease of Doing Business Index and selected indices from the World Economic Forum. The remaining indicators are calculated primarily with the most recent available data from the International Monetary Fund, the United Nations and the World Trade Organization.

Due to the different scalability of the individual indicators, data must be normalized to a standardized value range. We use a scale from 0 to 10, with 0 being the worst manifestation of individual indicators and 10 being the best. Dampening factors are applied to extreme outliers in order to prevent distortions.

The normalized individual indicators are compiled into nine sub-indices. The subsequent weighting of the nine sub-indices takes into consideration the different objectives of foreign activities by German companies by varying according to the orientation of the sub-ranking. For instance, market size measured by the gross domestic product is weighted more heavily in the exports sub-ranking than in the foreign direct investment sub-ranking.

The Prognos Free Trade and Investment Index is compiled for 100 economies including the European Union as an aggregate (without Germany).[41] Market size, as measured by the gross domestic product from the year 2007, the first year in which the globalization report was published, is decisive for the country selection. The spectrum of national economies ranges from the United States, with a gross domestic product of US$15.1 trillion, to Zimbabwe with an economic output of US$9.5 billion in 2011.

40 The availability of the data we used up to this point from the The Global Competitiveness Report series of the World Economic Forum worsened with the latest publication 2012–2013, and required some adjustments this year. The Market Efficiency sub-index is affected, as three individual indicators will no longer be available for this area. However, in the future adequate alternatives from the Fraser Institute can be used for the indicators capital market completeness and capital market controls, for describing foreign financial markets. On the other hand, we found no suitable substitute for the individual indicator, non-wage labor costs, so this is no longer used to represent market efficiency. Although the use of two new indicators as well as the reduced number of explanatory variables makes it more difficult to compare this year's rankings with its predecessors, the results nevertheless remain the same in regard to general trends.

41 In deviation from the calculations and simulations in Chapter 2, the number of countries being analyzed is not restricted by the country selection in VIEW, which results in a larger set.

Table 22: The sub-indices and individual indicators of the Prognos Free Trade and Investment Index

1. Market size	6. Stability
1.1 Gross domestic product	6.1 Sovereign Credit Ranking
	6.2 Inflation
2. Openness	6.3 Current account balance
2.1 Degree of openness	6.4 Political stability
2.2 Direct investments	6.5 Exchange rate movements compared to the euro
2.3 Integration status	
2.4 Tariffs compared to EU	7. Education, R&D, innovations
2.5 Non-tariff barriers to trade	7.1 Secondary education
2.6 Trade disputes	7.2 Higher education
	7.3 Availability of natural scientists and engineers
3. Development level	7.4 R&D expenditures of private companies
3.1 Per capita income	
3.2 Human Development Index	8. Market efficiency
3.3 Intra-industrial trade	8.1 Capital transaction restrictions
3.4 Degree of urbanization	8.2 Capital market completeness
	8.3 Wages and productivity
4. Institutions/ Infrastructure	8.4 Local competition
4.1 Property rights	8.5 Anti-monopoly laws
4.2 Level of regulation	8.6 Prevalence of foreign ownership
4.3 Infrastructure	
4.4 Corruption	9. Distance from Germany
	9.1 Distance of capitals
5. Practical business activities	9.2 Sea route
5.1 Ease of Doing Business Index	

Source: Prognos 2014

3.2 The most appealing foreign markets 2013

The ranking of the most attractive foreign markets for German businesses is illustrated through the overall ranking (Table 23) and the four focus-specific sub-rankings (Table 24 to Table 27).

The overall ranking shows that despite the current crisis in the European Union and above all in the euro zone countries, the most attractive general conditions for Germany's foreign activities continue to exist in European nations. Beyond that, the United States and some Asian countries, in particular, offer appealing foreign markets for German companies.

Despite a common domestic market and common currency within currently 17 countries, the European Union still represents a very heterogeneous economic area. This distinctive characteristic is also emphasized by the broad spectrum of rankings among European Union member states in the overall ranking: from 5th place (Finland) to 57th place (Greece).

In this ranking, older member states generally place significantly above the newer members. The exports sub-ranking particularly makes clear that primarily European countries – especially Germany's neighbors – offer the best conditions for German exporters.

In Europe, the northern countries of Finland, Norway, Sweden and Denmark have long been highly appealing both as an export market and for investment activities by German businesses. Thanks to the high level of development, a well-established infrastructure, optimal institutional framework conditions and a high degree of economic and political stability, they currently belong among the top 15 most appealing foreign markets in four out of five rankings.

By contrast, the northern countries as well as many other European economies fall in the middle range or the lower half of the "dynamic trends" ranking. In general we observe that countries that represent very attractive foreign markets for German businesses today and place very well in the "current state" ranking display comparatively low dynamic trends. This is due primarily to the already advanced state of development of these economies, which partly limits the potential for additional growth.

North America represents an exceptionally appealing market for German exporters and investors overall, with the United States in 2nd place and Canada in 19th place. Both countries exhibit similar strengths and weaknesses in framework conditions and display a balanced picture in the individual rankings, with the exception of dynamic trends. The main weak point of both economies is their lack of openness. Tariffs and non-tariff barriers to trade hamper German exports in this region to a greater degree than in other countries. A free trade agreement between the European Union and the United States, which is currently being discussed, would mitigate this problem. Nonetheless, the strong purchasing power and market size – especially in the United States – currently ensures demand security for German products. Other strengths of North America lie in the high quality of the infrastructure, advantageous institutional framework conditions and good prerequisites for education, research and development and innovation.

Three Asian countries placed among the top 15 in the overall ranking with Singapore (1st place), Hong Kong (4th place) and Japan (12th place). Although China placed in the top third in 30th place, it still ranks far behind the top-placed Asian countries. Singapore and Hong Kong are appealing despite their small market size and are very attractive destinations especially with respect to direct investment.

By contrast, China takes a leading position in the dynamic trends ranking thanks to its high growth rates. But China still needs to make substantial adjustments before it can achieve the high level of the most appealing foreign markets with regard to economic and institutional framework conditions. All in all, China is on a good path: Since the index was compiled for the first time in 2008, the country has managed great progress in key institutional prerequisites such as the protection of property rights.

Table 23: Overall ranking of the Free Trade and Investment Index 2013

Rank	National economy	Value	Rank	National economy	Value
1	Singapore	7.00	51	Mexico	4.68
2	United States	6.98	52	South Africa	4.68
3	EU	6.98	53	Thailand	4.64
4	Hong Kong	6.86	54	Peru	4.64
5	Finland	6.76	55	Croatia	4.61
6	Sweden	6.72	56	Jordan	4.59
7	United Kingdom	6.69	57	Greece	4.57
8	Switzerland	6.66	58	Morocco	4.46
9	Denmark	6.64	59	Colombia	4.46
10	Luxembourg	6.62	60	Kazakhstan	4.39
11	France	6.62	61	Brazil	4.34
12	Japan	6.55	62	Uruguay	4.33
13	Belgium	6.54	63	Trinidad and Tobago	4.23
14	Netherlands	6.49	64	Ghana	4.16
15	Norway	6.33	65	Russia	4.13
16	Ireland	6.31	66	Azerbaijan	4.05
17	Austria	6.25	67	Costa Rica	4.04
18	Estonia	6.11	68	Indonesia	3.94
19	Canada	6.04	69	India	3.91
20	Spain	5.90	70	Lebanon	3.88
21	Qatar	5.89	71	Sri Lanka	3.87
22	Iceland	5.87	72	Vietnam	3.81
23	South Korea	5.85	73	El Salvador	3.81
24	United Arab Emirates	5.77	74	Guatemala	3.79
25	Czech Republic	5.69	75	Libya	3.77
26	Saudi Arabia	5.68	76	Ukraine	3.74
27	Slovenia	5.64	77	Ecuador	3.74
28	Lithuania	5.63	78	Serbia	3.72
29	Australia	5.60	79	Dominican Republic	3.70
30	China	5.60	80	Philippines	3.69
31	Portugal	5.59	81	Egypt	3.67
32	Israel	5.57	82	Nigeria	3.64
33	New Zealand	5.56	83	Argentina	3.56
34	Slovak Republic	5.55	84	Algeria	3.54
35	Poland	5.54	85	Belarus	3.49
36	Taiwan	5.53	86	Camaroon	3.45
37	Latvia	5.46	87	Cote d'Ivoire	3.44
38	Cyprus	5.45	88	Kenya	3.38
39	Italy	5.44	89	Turkmenistan	3.35
40	Hungary	5.43	90	Bangladesh	3.31
41	Malaysia	5.41	91	Pakistan	3.28
42	Bahrain	5.25	92	Syria	3.15
43	Chile	5.23	93	Iran	3.03
44	Bulgaria	5.17	94	Yemen	2.81
45	Oman	5.10	95	Zimbabwe	2.77
46	Kuwait	4.85	96	Angola	2.74
47	Panama	4.76	97	Venezuela	2.69
48	Turkey	4.73	98	Ethiopia	2.54
49	Tunisia	4.71	99	Sudan	2.47
50	Romania	4.70	100	Uzbekistan	2.46

Source: Prognos 2014

Table 24: "Current status" sub-ranking of the Free Trade and Investment Index 2013

Rank	National economy	Value	Rank	National economy	Value
1	United States	7.20	51	South Africa	4.62
2	EU	7.19	52	Tunisia	4.62
3	Singapore	7.16	53	Croatia	4.60
4	Finland	6.94	54	Jordan	4.59
5	United Kingdom	6.90	55	Panama	4.57
6	Sweden	6.88	56	Thailand	4.55
7	Denmark	6.84	57	Peru	4.45
8	Hong Kong	6.80	58	Colombia	4.32
9	France	6.80	59	Kazakhstan	4.30
10	Switzerland	6.79	60	Morocco	4.29
11	Luxembourg	6.73	61	Brazil	4.22
12	Japan	6.69	62	Trinidad and Tobago	4.16
13	Netherlands	6.62	63	Uruguay	4.15
14	Belgium	6.60	64	Russia	4.04
15	Norway	6.46	65	Azerbaijan	3.98
16	Ireland	6.42	66	Costa Rica	3.93
17	Austria	6.37	67	Ghana	3.91
18	Estonia	6.26	68	Lebanon	3.75
19	Canada	6.15	69	Indonesia	3.74
20	Spain	6.02	70	Libya	3.69
21	Iceland	5.89	71	Sri Lanka	3.68
22	South Korea	5.84	72	India	3.67
23	United Arab Emirates	5.80	73	El Salvador	3.67
24	Qatar	5.78	74	Guatemala	3.64
25	Czech Republic	5.72	75	Ukraine	3.63
26	Slovenia	5.69	76	Vietnam	3.56
27	Lithuania	5.68	77	Philippines	3.56
28	Saudi Arabia	5.67	78	Serbia	3.54
29	Portugal	5.66	79	Egypt	3.54
30	Australia	5.63	80	Ecuador	3.52
31	New Zealand	5.63	81	Dominican Republic	3.48
32	Israel	5.60	82	Nigeria	3.40
33	Slovak Republic	5.55	83	Argentina	3.33
34	Latvia	5.54	84	Algeria	3.33
35	Cyprus	5.53	85	Cote d'Ivoire	3.27
36	Italy	5.52	86	Camaroon	3.26
37	Poland	5.50	87	Belarus	3.24
38	China	5.49	88	Kenya	3.17
39	Taiwan	5.48	89	Pakistan	3.12
40	Hungary	5.45	90	Bangladesh	3.00
41	Malaysia	5.42	91	Syria	2.91
42	Bahrain	5.31	92	Iran	2.89
43	Chile	5.19	93	Turkmenistan	2.89
44	Bulgaria	5.14	94	Yemen	2.65
45	Oman	4.99	95	Zimbabwe	2.60
46	Kuwait	4.80	96	Venezuela	2.58
47	Romania	4.67	97	Angola	2.55
48	Turkey	4.65	98	Sudan	2.31
49	Mexico	4.63	99	Ethiopia	2.24
50	Greece	4.62	100	Uzbekistan	2.07

Source: Prognos 2014

Table 25: "Dynamic trends" sub-ranking of the Free Trade and Investment Index 2013

Rank	National economy	Value	Rank	National economy	Value
1	Turkmenistan	7.54	51	Ireland	5.30
2	Hong Kong	7.37	52	Ethiopia	5.29
3	Qatar	6.80	53	Hungary	5.25
4	China	6.65	54	Kenya	5.23
5	Panama	6.49	55	Austria	5.23
6	Ghana	6.40	56	Kazakhstan	5.22
7	Peru	6.33	57	Finland	5.21
8	India	6.12	58	Mexico	5.19
9	Oman	6.06	59	Camaroon	5.18
10	Bangladesh	6.04	60	Lithuania	5.18
11	Belgium	6.02	61	South Africa	5.17
12	Vietnam	6.01	62	Guatemala	5.16
13	Morocco	5.97	63	Slovenia	5.16
14	South Korea	5.95	64	Lebanon	5.10
15	Taiwan	5.94	65	Norway	5.09
16	Uruguay	5.93	66	El Salvador	5.08
17	Uzbekistan	5.92	67	United States	5.06
18	Nigeria	5.89	68	EU	5.06
19	Poland	5.87	69	Costa Rica	5.05
20	Ecuador	5.77	70	Romania	5.04
21	Saudi Arabia	5.76	71	Canada	5.01
22	Indonesia	5.70	72	France	5.00
23	Luxembourg	5.69	73	New Zealand	4.97
24	Dominican Republic	5.68	74	Russia	4.96
25	Belarus	5.66	75	Portugal	4.96
26	Colombia	5.66	76	Cote d'Ivoire	4.95
27	Iceland	5.66	77	Egypt	4.91
28	Slovak Republic	5.59	78	Trinidad and Tobago	4.88
29	Chile	5.58	79	Philippines	4.85
30	Tunisia	5.57	80	Spain	4.85
31	Sri Lanka	5.56	81	Denmark	4.85
32	Argentina	5.54	82	United Kingdom	4.82
33	Singapore	5.53	83	Pakistan	4.76
34	Thailand	5.52	84	Ukraine	4.76
35	Bulgaria	5.51	85	Estonia	4.74
36	Switzerland	5.49	86	Italy	4.71
37	United Arab Emirates	5.48	87	Croatia	4.70
38	Brazil	5.44	88	Bahrain	4.68
39	Czech Republic	5.39	89	Latvia	4.67
40	Algeria	5.38	90	Azerbaijan	4.67
41	Turkey	5.38	91	Cyprus	4.66
42	Syria	5.36	92	Jordan	4.58
43	Kuwait	5.35	93	Libya	4.47
44	Malaysia	5.34	94	Angola	4.44
45	Israel	5.34	95	Zimbabwe	4.38
46	Australia	5.33	96	Iran	4.27
47	Netherlands	5.32	97	Yemen	4.25
48	Sweden	5.32	98	Greece	4.06
49	Serbia	5.32	99	Sudan	3.83
50	Japan	5.31	100	Venezuela	3.67

Source: Prognos 2014

Table 26: "Exports" sub-ranking of the Free Trade and Investment Index 2013

Rank	National economy	Value	Rank	National economy	Value
1	EU	7.83	51	South Africa	4.43
2	United States	7.38	52	Croatia	4.39
3	United Kingdom	6.93	53	Morocco	4.36
4	France	6.81	54	Jordan	4.35
5	Sweden	6.61	55	Kuwait	4.34
6	Netherlands	6.57	56	Panama	4.26
7	Denmark	6.55	57	Peru	4.25
8	Luxembourg	6.45	58	Colombia	4.22
9	Japan	6.44	59	Brazil	4.21
10	Finland	6.44	60	Thailand	4.12
11	Switzerland	6.37	61	Russia	4.08
12	Belgium	6.36	62	Ghana	3.94
13	Singapore	6.30	63	Belarus	3.93
14	Norway	6.19	64	Kazakhstan	3.93
15	Austria	6.19	65	Libya	3.91
16	Ireland	6.12	66	Serbia	3.76
17	Hong Kong	6.05	67	Uruguay	3.72
18	Spain	6.04	68	Lebanon	3.71
19	Estonia	6.02	69	Trinidad and Tobago	3.67
20	Czech Republic	5.73	70	Costa Rica	3.66
21	Canada	5.66	71	Ukraine	3.61
22	Italy	5.64	72	Egypt	3.60
23	Lithuania	5.64	73	Azerbaijan	3.59
24	Iceland	5.62	74	India	3.57
25	Latvia	5.57	75	El Salvador	3.48
26	Portugal	5.57	76	Dominican Republic	3.46
27	Slovenia	5.54	77	Algeria	3.42
28	Hungary	5.54	78	Sri Lanka	3.42
29	Slovak Republic	5.54	79	Indonesia	3.42
30	China	5.53	80	Guatemala	3.37
31	Poland	5.51	81	Ecuador	3.34
32	United Arab Emirates	5.48	82	Argentina	3.33
33	Israel	5.37	83	Nigeria	3.30
34	South Korea	5.34	84	Philippines	3.25
35	Cyprus	5.31	85	Vietnam	3.24
36	Qatar	5.31	86	Syria	3.22
37	Saudi Arabia	5.18	87	Camaroon	3.17
38	Bulgaria	4.97	88	Pakistan	3.13
39	Bahrain	4.96	89	Cote d'Ivoire	3.10
40	Malaysia	4.92	90	Kenya	3.01
41	Australia	4.90	91	Turkmenistan	2.97
42	Turkey	4.80	92	Bangladesh	2.88
43	New Zealand	4.77	93	Venezuela	2.80
44	Greece	4.72	94	Yemen	2.75
45	Tunisia	4.69	95	Iran	2.68
46	Romania	4.65	96	Zimbabwe	2.64
47	Mexico	4.64	97	Angola	2.57
48	Taiwan	4.58	98	Sudan	2.31
49	Chile	4.58	99	Uzbekistan	2.15
50	Oman	4.57	100	Ethiopia	2.13

Source: Prognos 2014

Table 27: "Foreign direct investment" sub-ranking of the Free Trade and Investment Index 2013

Rank	National economy	Value	Rank	National economy	Value
1	Singapore	7.93	51	Panama	4.84
2	Finland	7.50	52	Tunisia	4.82
3	Hong Kong	7.37	53	Mexico	4.81
4	Sweden	7.25	54	Romania	4.71
5	Denmark	7.25	55	Kuwait	4.67
6	United Kingdom	7.23	56	Colombia	4.63
7	Switzerland	7.22	57	Greece	4.52
8	Netherlands	7.01	58	Uruguay	4.46
9	United States	6.99	59	Kazakhstan	4.46
10	EU	6.97	60	Morocco	4.45
11	Japan	6.96	61	Croatia	4.36
12	France	6.91	62	Ghana	4.35
13	Norway	6.84	63	Trinidad and Tobago	4.30
14	Ireland	6.84	64	Sri Lanka	4.19
15	New Zealand	6.80	65	Brazil	4.14
16	Luxembourg	6.77	66	Costa Rica	4.13
17	Belgium	6.73	67	Indonesia	4.01
18	Estonia	6.61	68	Vietnam	3.90
19	South Korea	6.61	69	Guatemala	3.88
20	Canada	6.53	70	Azerbaijan	3.84
21	Austria	6.51	71	India	3.79
22	Iceland	6.32	72	Philippines	3.76
23	Taiwan	6.30	73	Lebanon	3.73
24	Australia	6.23	74	Egypt	3.69
25	Saudi Arabia	6.15	75	El Salvador	3.69
26	United Arab Emirates	6.14	76	Russia	3.66
27	Qatar	6.13	77	Nigeria	3.58
28	Spain	6.13	78	Ecuador	3.57
29	Malaysia	6.07	79	Dominican Republic	3.54
30	Israel	6.02	80	Pakistan	3.52
31	Cyprus	5.91	81	Kenya	3.49
32	Portugal	5.85	82	Ukraine	3.39
33	Bahrain	5.85	83	Camaroon	3.36
34	Lithuania	5.77	84	Argentina	3.25
35	Chile	5.77	85	Bangladesh	3.24
36	Latvia	5.76	86	Serbia	3.20
37	Czech Republic	5.72	87	Libya	3.16
38	Slovenia	5.70	88	Cote d'Ivoire	3.12
39	Slovak Republic	5.57	89	Iran	2.90
40	Poland	5.44	90	Algeria	2.71
41	Hungary	5.44	91	Zimbabwe	2.59
42	Oman	5.36	92	Syria	2.55
43	Italy	5.23	93	Belarus	2.50
44	China	5.21	94	Venezuela	2.25
45	Thailand	5.18	95	Angola	2.22
46	Bulgaria	5.17	96	Yemen	2.19
47	South Africa	5.02	97	Sudan	2.09
48	Jordan	5.00	98	Ethiopia	2.05
49	Peru	4.92	99	Turkmenistan	1.75
50	Turkey	4.88	100	Uzbekistan	1.19

Source: Prognos 2014

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5 Appendix A – Additional tables

Table 28: Globalization index over time: Argentina to Germany

	Argentina	Australia	Belgium	Brazil	Bulgaria	Chile	China	Denmark	Germany
1990	30.8	54.8	81.5	29.4	28.8	41.4	17.3	66.0	53.3
1991	32.2	55.5	82.9	31.4	27.3	43.7	17.4	69.3	58.7
1992	33.9	57.2	84.1	32.7	34.8	43.8	17.6	73.1	58.9
1993	37.3	58.7	84.7	33.2	34.2	44.5	18.0	75.2	59.9
1994	40.1	60.7	85.9	33.7	34.9	45.9	22.0	72.6	60.1
1995	43.1	61.1	82.7	35.7	38.8	46.7	23.7	75.3	61.4
1996	42.6	60.9	85.0	36.4	45.7	47.0	23.9	76.2	63.4
1997	42.4	61.3	87.3	36.1	43.8	48.4	24.7	76.0	65.7
1998	42.3	62.7	87.7	35.3	42.9	49.3	28.8	75.5	67.7
1999	41.8	64.0	89.7	36.1	45.8	51.6	27.8	77.2	69.9
2000	41.2	65.3	93.5	35.6	49.9	53.0	28.4	83.2	73.3
2001	39.1	66.2	93.2	39.8	50.1	58.2	33.7	82.4	71.9
2002	42.0	65.1	91.6	40.4	47.3	58.0	36.6	81.6	73.3
2003	39.7	66.1	90.6	38.7	50.6	61.7	37.2	82.1	74.1
2004	40.2	66.1	91.0	40.5	56.5	63.8	41.5	81.9	73.1
2005	38.2	65.0	90.7	41.7	54.7	64.5	43.3	82.6	72.1
2006	37.9	67.2	91.8	41.3	60.9	66.4	40.5	83.0	72.8
2007	37.5	68.9	92.6	41.6	69.2	69.3	42.8	85.3	73.2
2008	37.4	65.3	91.8	39.7	66.1	68.3	41.5	82.2	70.5
2009	35.7	67.4	91.5	40.0	63.2	66.8	42.0	80.8	70.2
2010	35.5	68.0	90.1	40.8	62.2	65.7	42.2	81.5	69.7
2011	34.5	67.1	89.0	40.1	61.7	62.4	40.9	80.9	69.2

Source: Prognos 2014

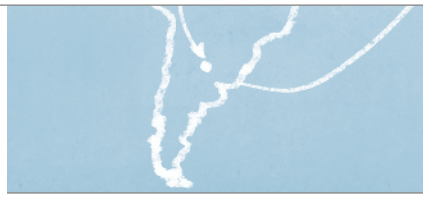


Table 29: Globalization index over time: Estonia to Japan

	Estonia	Finland	France	Greece	India	Ireland	Israel	Italy	Japan
1990	34.9	55.8	61.7	39.0	18.2	76.6	40.6	53.3	37.8
1991	35.7	59.1	64.1	48.1	18.7	78.6	40.2	55.2	39.1
1992	38.1	61.4	65.4	49.0	19.7	79.7	40.6	56.7	43.5
1993	42.9	64.0	66.5	51.4	20.5	81.4	43.5	58.9	44.1
1994	49.7	65.0	64.2	52.0	20.9	83.1	44.1	58.4	44.1
1995	60.9	65.8	65.3	52.3	21.6	82.5	43.6	59.2	40.9
1996	61.9	69.7	66.3	54.0	23.7	83.2	45.7	60.5	44.7
1997	65.5	70.7	68.7	55.8	23.8	83.6	48.3	62.5	45.6
1998	65.6	72.1	71.5	58.9	23.8	87.7	51.1	64.9	46.8
1999	66.1	73.4	73.7	62.1	24.0	88.8	54.9	66.2	47.5
2000	68.5	77.5	76.3	65.5	24.6	91.3	58.4	68.6	48.6
2001	69.5	77.4	72.3	65.7	25.1	91.1	60.4	67.2	48.1
2002	69.1	76.9	73.5	65.5	25.4	90.0	61.5	66.1	47.6
2003	71.1	78.2	74.2	67.8	26.9	89.4	62.5	65.2	50.6
2004	74.7	78.6	76.8	69.0	27.5	89.9	61.0	67.9	50.9
2005	72.7	76.1	75.3	66.3	30.2	90.4	63.6	66.7	51.4
2006	74.4	76.2	76.6	66.8	30.5	87.5	63.1	65.8	52.6
2007	76.7	78.1	77.5	68.4	32.0	89.0	64.1	66.1	52.8
2008	75.7	75.4	73.6	67.8	33.1	87.6	65.5	64.4	51.2
2009	73.7	74.9	75.6	66.3	33.3	91.3	64.2	65.1	51.4
2010	75.8	76.6	75.3	64.9	32.7	92.1	64.9	64.8	51.3
2011	73.9	76.7	73.0	63.6	32.4	91.0	61.8	63.1	50.1

Source: Prognos 2014

Table 30: Globalization index over time: Canada to Austria

	Canada	Latvia	Lithuania	Mexico	New Zealand	Netherlands	Norway	Austria
1990	62.6	27.3	27.0	35.4	54.1	76.2	67.6	65.0
1991	63.7	28.3	27.7	35.8	57.3	77.9	69.4	68.4
1992	64.3	29.9	28.7	39.5	59.4	78.4	68.6	68.4
1993	65.6	33.6	30.9	39.4	60.7	78.5	69.4	69.5
1994	66.5	38.5	37.6	40.3	62.6	80.1	70.1	70.2
1995	67.8	42.1	40.6	44.2	64.1	79.0	69.7	70.0
1996	68.9	46.5	45.5	39.9	64.8	80.3	70.3	71.4
1997	70.4	47.8	47.6	39.0	65.6	81.9	70.7	73.0
1998	71.9	49.5	47.4	38.5	66.2	84.6	71.4	74.5
1999	73.5	48.8	46.9	37.7	69.0	88.1	70.9	76.6
2000	74.8	49.4	47.2	37.6	71.4	93.9	71.6	79.2
2001	74.2	51.4	50.5	36.3	69.4	91.3	70.7	78.6
2002	72.4	52.0	51.4	37.1	69.0	88.8	68.2	78.4
2003	72.9	52.6	52.1	36.8	67.9	90.7	72.0	79.9
2004	73.2	56.6	54.3	37.1	68.9	88.7	68.5	80.3
2005	70.9	57.4	54.2	41.7	68.4	89.6	65.2	80.4
2006	70.5	59.1	54.5	39.4	70.2	90.2	68.6	81.7
2007	71.5	60.8	56.1	40.4	69.7	91.5	71.1	84.5
2008	69.8	59.5	57.8	39.6	70.1	90.5	68.7	81.0
2009	71.0	56.1	53.4	41.3	68.9	87.9	72.1	80.7
2010	70.8	57.7	56.0	42.1	68.7	89.0	70.1	79.5
2011	69.3	58.5	56.4	42.3	68.6	89.3	68.0	78.2

Source: Prognos 2014

Table 31: Globalization index over time: Poland to Slovenia

	Poland	Portugal	Romania	Russia	Sweden	Switzerland	Slovakia	Slovenia
1990	39.6	48.8	22.5	24.4	69.7	71.0	47.3	31.5
1991	41.1	52.7	26.8	24.5	71.2	73.3	46.0	34.9
1992	44.4	57.0	26.9	25.5	71.3	73.3	45.1	37.2
1993	46.1	60.6	28.7	29.1	73.3	74.8	43.9	39.3
1994	46.1	61.2	31.4	30.2	74.0	74.9	44.4	42.2
1995	47.4	62.3	35.5	32.1	74.4	74.5	47.2	41.7
1996	47.4	63.4	37.1	32.9	74.2	76.3	48.9	43.4
1997	48.7	64.5	38.7	33.7	75.8	80.0	51.0	49.5
1998	50.6	65.8	38.7	36.5	76.7	83.2	52.2	51.0
1999	51.3	66.2	40.3	37.6	77.6	85.3	52.9	51.1
2000	53.2	69.4	41.9	40.0	80.6	90.6	56.2	53.5
2001	51.0	71.5	43.1	41.4	79.9	87.8	58.0	54.7
2002	52.8	68.9	43.7	42.7	80.4	85.7	54.6	55.0
2003	55.6	71.0	44.4	42.9	80.9	84.7	54.8	59.0
2004	62.7	74.9	47.4	41.8	81.5	80.7	69.6	64.5
2005	59.6	72.3	52.0	42.6	81.2	82.6	69.8	64.1
2006	61.0	76.0	48.9	42.5	83.2	80.9	70.3	64.4
2007	63.4	77.8	61.2	44.1	84.9	81.5	72.1	66.8
2008	62.3	76.4	61.2	40.9	82.6	78.3	71.8	67.3
2009	63.0	77.3	60.2	43.5	83.9	78.8	70.3	63.8
2010	61.7	77.6	58.5	44.4	83.2	79.5	69.5	63.8
2011	60.8	75.7	56.5	43.4	79.6	77.4	68.6	63.1

Source: Prognos 2014

Table 32: Globalization index over time: Spain to the United Kingdom

	Spain	South Africa	South Korea	Czech Republic	Turkey	Hungary	United States	United Kingdom
1990	57.1	27.7	23.9	53.7	36.3	44.7	58.4	73.3
1991	58.4	25.7	25.6	57.3	38.1	45.5	59.7	72.7
1992	60.5	24.7	27.9	56.0	38.9	48.1	59.6	72.5
1993	61.7	24.3	34.1	54.9	41.8	49.8	60.8	74.8
1994	63.0	24.6	34.7	56.2	46.6	51.6	60.9	73.0
1995	63.6	29.3	35.1	58.2	48.4	55.4	62.0	74.8
1996	64.2	31.3	36.4	59.0	47.8	58.6	62.5	75.8
1997	65.8	34.3	37.8	60.8	49.0	63.3	63.2	76.2
1998	67.1	36.9	41.2	62.3	47.0	65.3	64.0	78.1
1999	68.6	44.5	40.3	64.2	46.3	66.4	64.9	80.3
2000	71.2	46.3	41.6	66.4	47.0	68.1	65.5	83.5
2001	70.8	47.7	44.8	67.0	47.2	71.6	63.9	81.5
2002	70.6	48.2	43.7	68.0	45.7	68.5	61.2	80.8
2003	72.3	48.1	43.0	66.9	47.8	68.0	62.5	82.2
2004	71.6	46.6	45.4	72.6	49.6	77.0	63.8	79.4
2005	69.6	47.8	44.3	71.3	53.5	73.9	63.0	81.5
2006	70.2	49.1	46.1	71.8	50.2	78.2	64.5	83.7
2007	71.7	50.9	48.4	75.2	50.4	79.2	65.7	82.6
2008	70.2	49.7	48.1	72.8	50.3	78.2	62.4	81.0
2009	70.5	49.9	47.5	72.4	51.7	81.1	60.4	82.6
2010	70.7	49.9	47.4	72.4	50.5	80.1	60.9	82.9
2011	69.7	48.6	47.8	70.8	48.8	77.6	60.7	82.4

Source: Prognos 2014

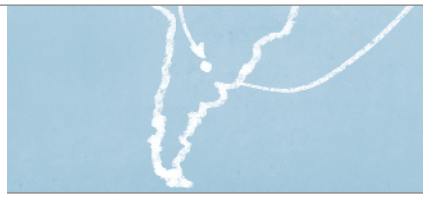


Table 33: Regression results on the determinants of per capita growth – robustness checks

Dependent variable: Growth of the per capita gross domestic product as a percent	IV method with FE	IV method with FE	IV method with FE	IV method with FE	IV method with FE	IV method with FE
Total globalization	0.35***	0.34***	0.32***	0.32***	0.32***	0.33***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Gross domestic product per capita in the next-to-last period (logarithmized)	–10.48***	–10.25***	–10.20***	–10.06***	–10.01***	–9.93***
	(1.60)	(1.59)	(1.69)	(1.77)	(1.78)	(1.76)
Birth rate (logarithmized)	–10.44***	–9.89***	–9.88***	–10.86***	–10.76***	–10.97***
	(2.42)	(2.38)	(2.46)	(2.61)	(2.64)	(2.83)
Investments (as a % of the gross domestic product)	0.15	0.15	0.14	0.05	0.05	0.06
	(0.10)	(0.10)	(0.11)	(0.14)	(0.14)	(0.14)
Crisis indicator 2008–2009	–3.55***	–3.60***	–3.39***	–3.40***	–3.35***	–3.35***
	(0.43)	(0.43)	(0.48)	(0.50)	(0.48)	(0.48)
Inflation (as a %)		–0.003	–0.003	–0.003	–0.003	–0.003
		(0.003)	(0.004)	(0.003)	(0.003)	(0.003)
Government consumer spending			–0.18	–0.13	–0.11	–0.11
			(0.16)	(0.16)	(0.16)	(0.16)
Public debt (as a % of the gross domestic product)				–0.04	–0.04	–0.03
				(0.02)	(0.02)	(0.02)
Rule of Law Index					0.45	0.47
					(0.40)	(0.40)
Continuing education						–0.01
						(0.02)
Number of observations	840	840	840	840	840	840
R^2 (centered)	0,40	0,41	0,41	0,40	0,41	0,41

Notes: The symbols *, **, *** indicate the significance of the estimation results for the 10%, 5% and 1% levels. Standard errors are clustered by country and displayed in parentheses. All regressions contain a constant. FE is the abbreviation for country-specific fixed effects.

Source: Prognos 2014

Table 34: Regression results on the determinants of per capita growth with country-specific estimators for the effects of globalization on growth – robustness checks

Dependent variable: Growth of the per capita gross domestic product as a percent	IV method with FE and country groups	IV method with FE and country groups	IV method with FE and country groups	IV method with FE and country groups	IV method with FE and country groups	IV method with FE and country groups
Globalization for						
Large national economies with a high per capita income	0.26***	0.26***	0.26***	0.29***	0.30***	0.29***
	(0.05)	(0.04)	(0.05)	(0.06)	(0.06)	(0.06)
Small national economies with a high per capita income	0.26***	0.25***	0.25***	0.21**	0.22**	0.22**
	(0.06)	(0.06)	(0.07)	(0.07)	(0.08)	(0.08)
Large national economies with a low per capita income	0.29	0.26	0.26	0.25*	0.23	0.23
	(0.16)	(0.14)	(0.14)	(0.12)	(0.12)	(0.12)
Small national economies with a low per capita income	0.40***	0.39***	0.37***	0.37***	0.38***	0.38***
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
Gross domestic product per capita in the next-to-last period (logarithmized)	–10.02***	–9.74***	–9.75***	–9.51***	–9.33***	–9.27***
	(1.70)	(1.62)	(1.67)	(1.71)	(1.75)	(1.73)
Birth rate (logarithmized)	–10.19**	–9.81**	–9.77**	–10.96**	–11.12**	–11.29**
	(3.26)	(3.21)	(3.30)	(3.38)	(3.40)	(3.60)
Investments (as a % of the gross domestic product)	0.12	0.12	0.12	0.02	0.02	0.02
	(0.10)	(0.10)	(0.10)	(0.14)	(0.14)	(0.14)
Crisis indicator 2008– 2009	–3.59***	–3.65***	–3.46***	–3.47***	–3.40***	–3.41***
	(0.43)	(0.44)	(0.50)	(0.52)	(0.50)	(0.50)
Inflation (as a %)		–0.00	–0.00	–0.00	–0.00	–0.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Government consumer spending			–0.15	–0.10	–0.07	–0.07
			(0.16)	(0.16)	(0.16)	(0.16)
Public debt (as a % of the gross domestic product)				–0.04*	–0.04	–0.04
				(0.02)	(0.02)	(0.02)
Rule of Law Index					0.56	0.58
					(0.38)	(0.38)
Continuing education						–0.01
						(0.02)
Number of observations	840	840	840	840	840	840
R^2 (centered)	0.40	0.41	0.41	0.40	0.41	0.41

Notes: The symbols *, **, *** indicate the significance of the estimation results for the 10%, 5% and 1% levels. Standard errors are clustered by country and displayed in parentheses. All regressions contain a constant. FE is the abbreviation for country-specific fixed effects.

Source: Prognos 2014

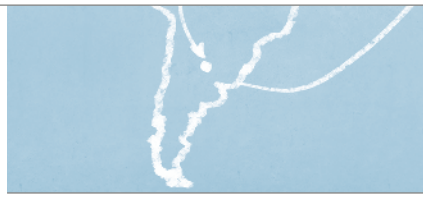


Table 35: Globalization-induced absolute increase in the gross domestic product per capita between 1990 and 2011 in relation to the total increase in the gross domestic product per capita

Rank	Country	Absolute increase in the gross domestic product per capita caused by increasing globalization, in euros*	Total absolute increase in the per capita gross domestic product, in euros*	Portion of the increase in the gross domestic product per capita caused by increasing globalization, as a percent
1	Finland	2,070	8,310	25.0
2	Japan	1,780	5,950	30.0
3	Israel	1,750	8,400	20.9
4	Denmark	1,670	7,370	22.7
5	Germany	1,510	7,190	21.0
6	Ireland	1,450	15,260	9.5
7	Slovenia	1,410	4,820	29.2
8	South Korea	1,410	10,650	13.2
9	Austria	1,290	8,710	14.8
10	Netherlands	1,240	8,420	14.7
11	Sweden	1,210	10,700	11.3
12	Australia	1,160	8,930	13.0
13	Portugal	1,130	3,240	34.8
14	Greece	1,080	3,040	35.6
15	France	960	4,830	19.9
16	United Kingdom	940	9,790	9.6
17	Switzerland	940	5,270	17.8
18	Estonia	910	2,220	41.0
19	New Zealand	800	3,720	21.5
20	Spain	700	4,410	15.8
21	Italy	680	2,550	26.8
22	Hungary	670	1,500	44.7
23	Belgium	670	6,380	10.5
24	Canada	640	6,940	9.2
25	Slovakia	640	3,710	17.2
26	Lithuania	640	2,000	31.8
27	Latvia	610	1,990	30.9
28	Chile	530	4,180	12.6
29	Poland	510	4,040	12.6
30	Czech Republic	500	2,780	17.9
31	Romania	320	840	37.9
32	Bulgaria	310	1,080	28.9
33	United States	310	11,100	2.8
34	South Africa	290	750	38.8
35	Turkey	270	2,550	10.6
36	Russia	220	470	46.8
37	China	210	2,440	8.5
38	Mexico	200	1,670	12.2
39	Brazil	190	1,570	12.1
40	Argentina	180	6,550	2.7
41	Norway	100	13,310	0.7
42	India	40	590	7.3

* real prices from the year 2000; rounded values; ** in percent

Source: Prognos 2014

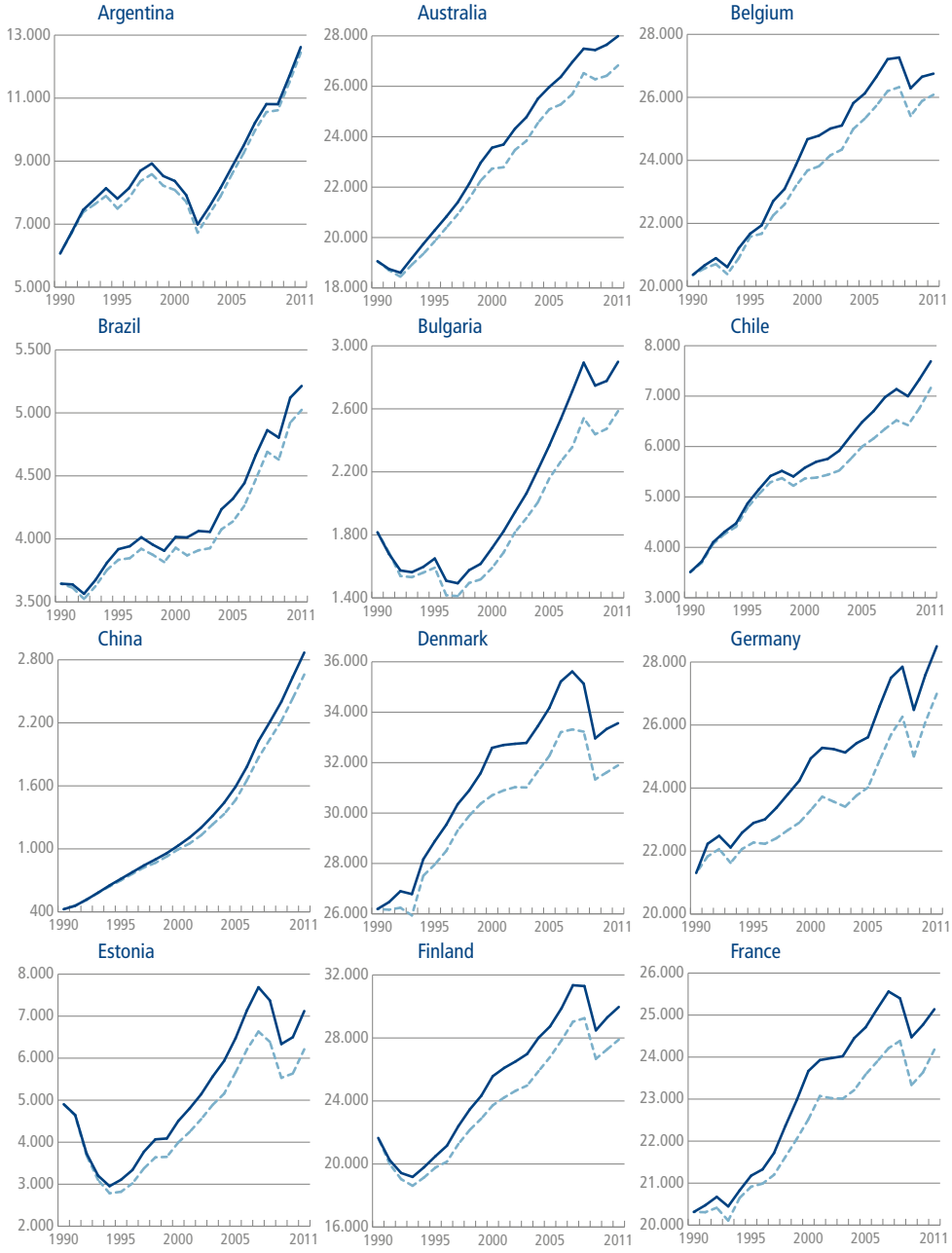
Table 36: Globalization-induced relative increase in the gross domestic product per capita between 1990 and 2011 in relation to the total increase in the gross domestic product per capita

Rank	Country	Increase in the gross domestic product per capita caused by increasing globalization in relation to the baseline level, as a percent	Total increase in the gross domestic product per capita in relation to the baseline level, as a percent	Portion of the increase in the gross domestic product per capita caused by increasing globalization in relation to the baseline level, as a percent
1	China	49.1	573.9	9.3
2	South Korea	18.8	142.1	13.3
3	Estonia	18.6	45.2	52.0
4	Bulgaria	17.2	59.6	33.0
5	Romania	15.5	41.0	15.2
6	Slovenia	15.5	53.0	42.5
7	Poland	15.1	119.8	14.3
8	Chile	15.0	119.1	30.5
9	Latvia	14.4	46.7	51.9
10	Hungary	14.2	31.7	37.3
11	Lithuania	13.6	42.9	44.3
12	India	12.4	169.4	26.3
13	Portugal	11.8	34.0	7.8
14	Slovakia	11.1	64.2	30.7
15	Israel	10.6	50.6	47.0
16	Greece	10.2	28.8	19.2
17	Finland	9.6	38.4	10.8
18	Ireland	9.5	99.7	27.3
19	South Africa	8.5	22.0	21.0
20	Czech Republic	8.5	47.3	46.1
21	Russia	7.8	16.7	63.5
22	Turkey	7.2	67.8	13.4
23	Germany	7.1	33.8	24.0
24	Denmark	6.4	28.1	17.5
25	New Zealand	6.3	29.5	24.7
26	Austria	6.2	41.7	16.8
27	Australia	6.1	46.9	15.0
28	Netherlands	6.0	41.1	17.0
29	Spain	5.7	35.8	23.6
30	Brazil	5.2	43.1	14.4
31	Japan	4.8	16.0	26.3
32	Sweden	4.8	41.9	13.1
33	France	4.7	23.8	31.6
34	United Kingdom	4.5	46.6	11.8
35	Italy	3.8	14.1	32.0
36	Mexico	3.3	27.2	12.4
37	Belgium	3.3	31.3	27.5
38	Canada	3.0	32.7	11.7
39	Argentina	2.9	107.9	13.4
40	Switzerland	2.5	14.2	3.3
41	United States	1.0	34.8	3.0
42	Norway	0.3	44.4	2.9

Source: Prognos 2014

6 Appendix B – Additional figures

Figure 4: Gross domestic product per capita with and without globalization from 1990 to 2011; Argentina to France; real GDP in euros, at prices of 2000



Source: Prognos 2014

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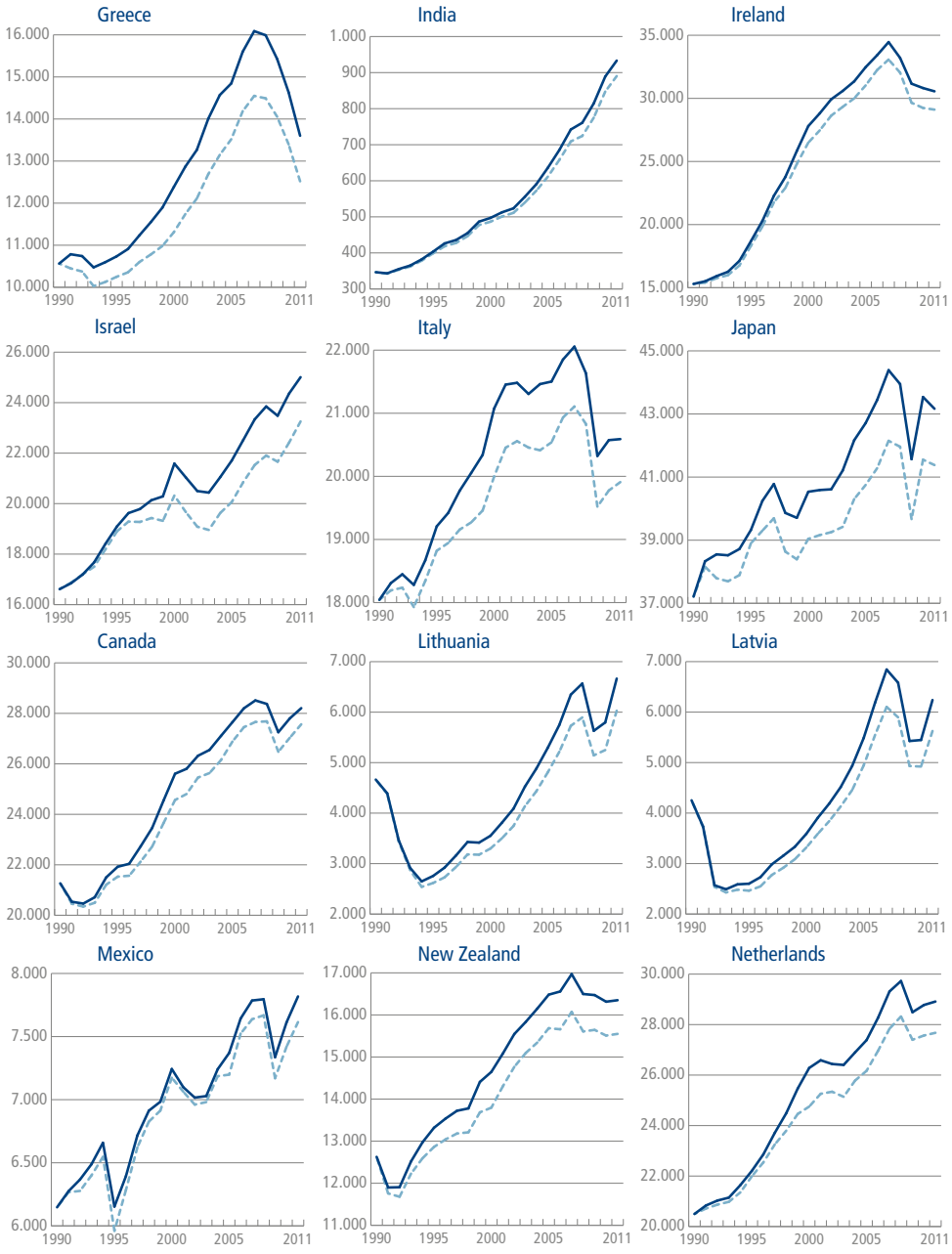
Figure 5: Gross domestic product per capita with and without globalization from 1990 to 2011; Greece to Netherlands; real GDP in euros, at prices of 2000



Source: Prognos 2014

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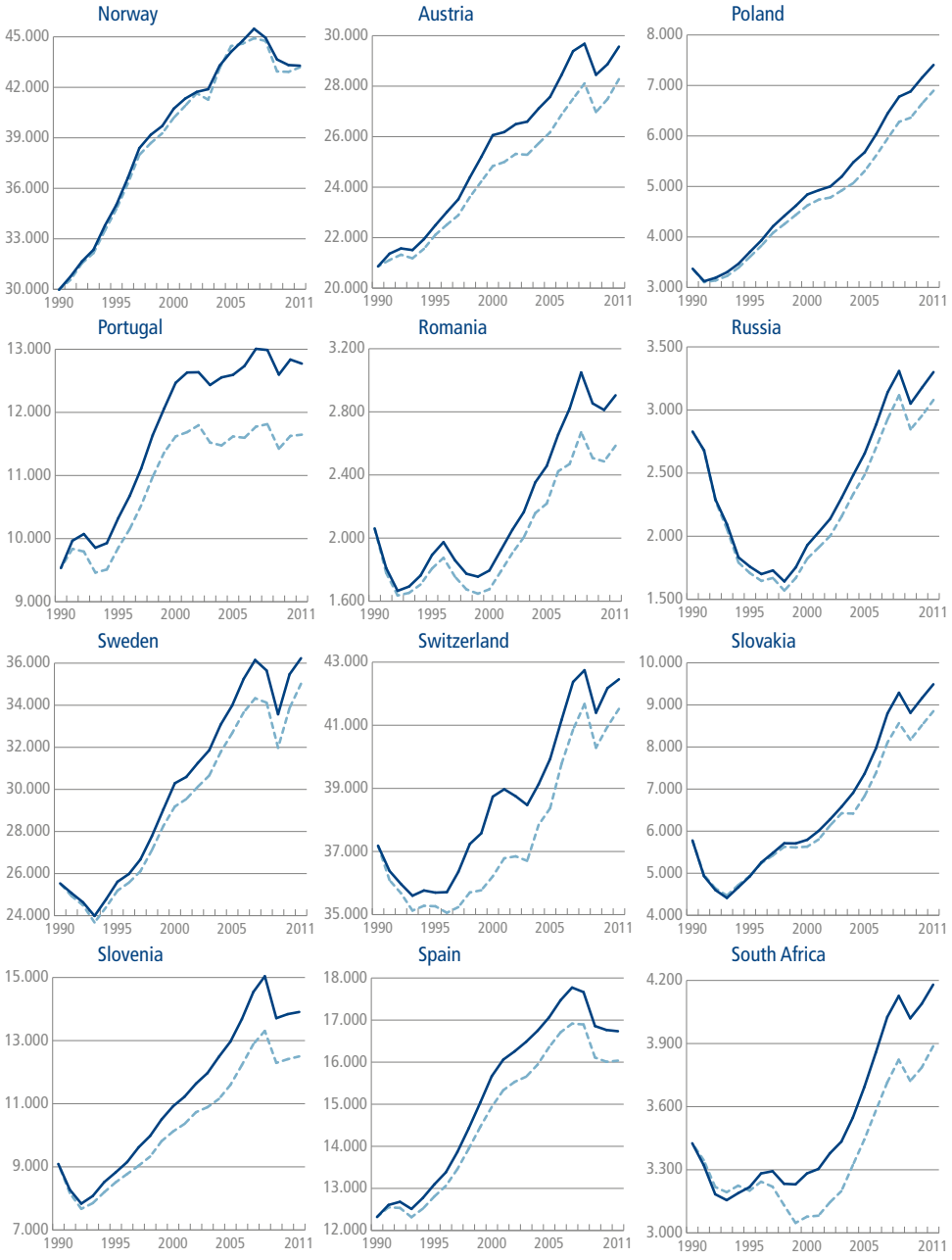
Figure 6: Gross domestic product per capita with and without globalization from 1990 to 2011; Norway to South Africa; real GDP in euros, at prices of 2000



Source: Prognos 2014

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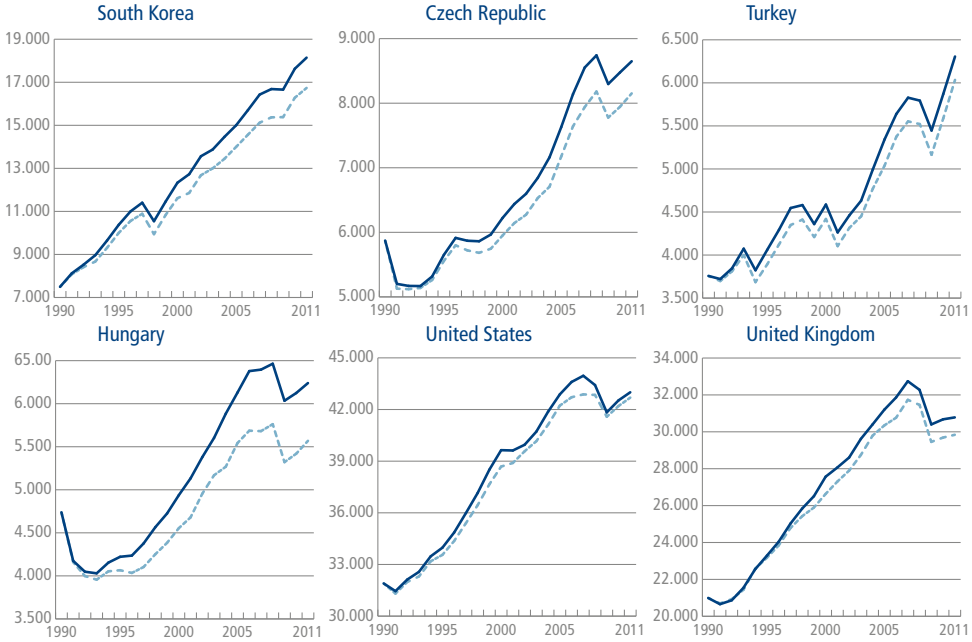
Figure 7: Gross domestic product per capita with and without globalization from 1990 to 2011; South Korea to the United Kingdom; real GDP in euros, at prices of 2000



Source: Prognos 2014

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About the Global Economic Dynamics (GED) project

The Global Economic Dynamics (GED) project of the Bertelsmann Foundation contributes to improving the understanding of the growing complexity of global economic developments. By using the most up-to-date tools and methods for measuring, forecasting and modeling global economic dynamics, the project seeks to make globalization, its economic effects and its political consequences more transparent and understandable.

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