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What drives export market shares? It depends! An empirical analysis using Bayesian Model Averaging

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This paper presents research conducted within the Competitiveness Research Network (CompNet). CompNet is a research network founded in 2012 to foster the debate on competitiveness and productivity issues among partner institutions and researchers. It aims at providing a robust theoretical and empirical link between drivers of competitiveness and macroeconomic performance for research and policy analysis purposes.

Originally founded by the European System of Central Banks (ESCB), CompNet now includes as partner institutions the European Central Bank (ECB), the European Commission (EC), the Leibniz Institute for Economic Research of Halle (IWH), the European Bank of Reconstruction and Development (EBRD), the European Investment Bank (EIB), the Tinbergen Institute and several national central banks.

CompNet-related research is conducted in two main work streams:

1) Productivity growth drivers and efficiency of resource allocation
2) International trade, euro area rebalancing and global value chains

Abstract

What drives external performance of countries? This is a recurring question in academia and policy. The factors underlying export growth are receiving great attention, as countries struggle to grow out of the crisis by increasing exports and as protectionist discourses take foot again. Despite decades of debates, it is still unclear what the drivers of external performance are and, importantly, which ones policy makers can influence. We use Bayesian Model Averaging in a panel setting to investigate the drivers of export market shares of 25 EU countries, considering a wide range of traditional indicators along with novel ones developed within the CompNet Competitiveness Research Network. We find that export market share growth is linked to different factors in the old and in the new Member States, with one exception: for both groups, competitive pressures from China have strongly affected export performance since the early 2000s. In the case of old EU Member States, investment, quality of institutions and available liquidity to firms also appear to play a role. For the new EU Member States, labour and total factor productivity are particularly important, while inward FDI matters rather than domestic investment. Price competitiveness does not seem to play a very important role in either set of countries: relative export prices do show correlation with export performance for the new Member States, but only when they are adjusted for quality. Our results point to the importance of considering the "exporting stage" of a country when discussing export-enhancing policies.

JEL Classification: C23, C51, C55, F14, O52,

Keywords: Export shares, Competitiveness, Bayesian Model Averaging

Non-technical summary

What drives external performance of countries? This is a long-standing and constantly recurring question in academia and policy. The factors underlying export growth are again receiving great attention: in the euro area the focus is on "how", as some countries have struggled to grow out of the crisis by increasing positive net trade contributions. On the world scene this question takes on a more fundamental, even political value, as protectionist discourses take foot again. For a rigorously founded policy analysis on how to enhance external performance, it is essential to identify the drivers behind the competitive position of individual countries, which is particularly difficult given the all-encompassing nature of the concept of competitiveness.

This paper develops a framework for analysing competitiveness, narrowly defined as the growth of export market shares, by analysing the importance of a comprehensive set of potential explanatory variables.

In policy discussions on how to enhance competitiveness, price and cost competitiveness indicators feature prominently. However, the analysis based solely on traditional price and cost-based macroeconomic indicators has proven unable to provide a comprehensive explanation of recent trade developments. Also, it is not very clear empirically which of the various indicators relates better to trade outcomes.

We consider 42 potential competitiveness drivers to capture various non-price dimensions of competitiveness on top of traditional price and costs measures; these additional dimensions relate to the macroeconomic environment, labour market and demographics, institutions, business environment, financial markets and trade specialisation.

Several public and private institutions, such as the World Economic Forum and the World Bank, have tried to measure non-price competitiveness by considering an extremely broad range of economic and social indicators. However, these approaches have as main limitation the fact that they do not provide a rigourous empirical assessment of the link between each considered indicator and a specific measure of competitiveness.

The challenge of selecting the main drivers of economic performance among a broad range of possible variables was discussed in the economic growth literature, which faces a similar lack of clear guidance from economic theory. This is known as the problem of "openendedness of theories" i.e. the variables proposed as competitiveness drivers in previous studies have some ex-ante plausibility and cannot be excluded a priori. In this case, one faces both the classical problem of estimation uncertainty and the additional one of model uncertainty related to the choice of regressors. We address this problem by employing Bayesian Model Averaging (BMA), which provides a formal treatment of model uncertainty by considering all possible sets of variables and assigning to each such set a posterior model probability of being "true" based on Bayesian inference.

Our paper extends the related literature by analysing drivers of external competitiveness searching through a comprehensive dataset that also includes novel indicators developed within the ESCB Competitiveness Research Network (CompNet) and by employing a full BMA approach in a panel setting. For robustness, we consider several model specifications in terms of time and country fixed effects.

We consider several model specifications, but the main pattern that emerges is that the expansion of export market shares is linked to different factors in the old and in the new Member States, with one exception: for both old and new EU Member States, competitive pressures from rapidly developing China strongly affected export performance since the early 2000s. In the case of old EU Member States, investment, quality of institutions and available liquidity to firms also appear to play a role for trade outcomes. For the new EU Member States, labour and total factor productivity are particularly important, and export market share growth is sustained by inward FDI rather than by domestic investment. In both sets of countries, price competitiveness does not seem to play a very important role. Relative export prices do show some consistent correlation with export performance for the new Member States, but only when they are adjusted for quality. Our results point to the importance of considering the "exporting stage" of a country when discussing export-enhancing policies.

Our analysis focuses on discovering empirical regularities, hence it can be hardly used as a platform for policy prescriptions. But a clear one does emerge: what sustains market share expansion changes according to the "maturity" of the exporting economy, with catching-up factors in terms of labour and total factor productivity being more important in emerging economies. Also, domestic investment and domestic financing has a central role in more advanced ones, while catching-up ones typically rely on inward FDI.

1 Introduction

What drives external performance of nations is a long-standing question in academia and policy makers' circles. Especially in the aftermath of the 2008–2009 financial crisis, the factors underlying export growth have received increased attention, as euro area stressed countries have struggled to grow out of the crisis by increasing positive net trade contributions. For a rigorously founded policy analysis on how to enhance external performance, it is essential to identify the drivers behind the competitive position of individual countries, which is particularly difficult given the all-encompassing nature of the concept of competitiveness.

This paper develops a framework for analysing competitiveness, narrowly defined as the growth of export market shares, by analysing the importance of a comprehensive set of potential explanatory variables.

In policy discussions on how to enhance competitiveness, price and cost competitiveness indicators feature prominently. However, the analysis based solely on traditional price and cost-based macroeconomic indicators has proven unable to provide a comprehensive explanation of recent trade developments . There is also little consensus on the appropriate indicators of price and cost competitiveness to be considered, as each relative price measure has conceptual and statistical advantages and drawbacks.[1] Also, it is not very clear empirically which of the various indicators relates better to trade outcomes (see for instance Ca'Zorzi and Schnatz (2007), Christodoulopoulou and Tkacevs (2013) and Giordano and Zollino (2015)).

We consider a broad set of competitiveness drivers (42 variables) in order to capture various non-price dimensions of competitiveness on top of traditional price and costs measures; these additional dimensions relate to the macroeconomic environment, labour market and demographics, institutions, business environment, financial markets and trade specialisation.

Several public and private institutions have tried to measure non-price competitiveness by considering an extremely broad range of economic and social indicators. Relevant examples are the World Economic Forum's Global Competitiveness Report or World Bank's Doing Business Report, which are benchmarks in competitiveness assessment of a country relative to the rest of the world (see e.g. Schwab and World Economic Forum (2013) and World Bank (2013)). However, they are largely based on survey-derived indicators and the underlying methodology has been subject to revisions. The European Competitiveness Report 2014 published by the European Commission focuses on policies which can help firms grow, foster and compete internationally (European

[1] Real effective exchange rates that use consumer prices as deflator ensure comparability across countries, but contain an important share of non-traded consumption goods and services; producer price based real effective exchange rate mainly consider tradable goods prices, but the underlying price measures are not fully comparable across countries (due to differences in composition and compilation); unit labour costs-based deflators have the drawback that they consider only one cost component and disregard capital-related and other costs, e.g. energy and commodities; the GDP deflator has also been considered in computing real effective exchange rates, but the underlying statistics can be subject to relatively large revisions.

Commission (2012)). Another relevant example is the World Bank's Trade Competitiveness Diagnostic Toolkit, which brings together a plethora of indicators useful to diagnose competitiveness under a unified conceptual framework and puts forward policy options based on country specific case studies (Reis and Farole (2012)). However, these approaches have as main limitation the fact that they do not provide a rigourous empirical assessment of the link between each considered indicator and a specific measure of competitiveness.

The challenge of selecting the main drivers of economic performance among a broad range of possible variables was discussed in the economic growth literature, which faces a similar lack of clear guidance from economic theory. This is known as the problem of "openendedness of theories" (Brock and Durlauf (2001)), i.e. the variables proposed as competitiveness drivers in previous studies have some ex-ante plausibility and cannot be excluded a priori. In this case, one faces both the classical problem of estimation uncertainty and the additional one of model uncertainty related to the choice of regressors. We address this problem by employing Bayesian Model Averaging (BMA), which provides a formal treatment of model uncertainty by considering all possible sets of variables and assigning to each such set a posterior model probability of being "true" based on Bayesian inference.

Our paper extends the related literature by analysing drivers of external competitiveness searching through a comprehensive dataset that also includes novel indicators developed within the ESCB Competitiveness Research Network (CompNet) and by employing a full BMA approach in a panel setting. For robustness, we consider several model specifications in terms of time and country fixed effects.

The country set in our analysis is limited to 25 EU countries (excluding Croatia, Malta and Luxembourg due to limited data availability) for the period covering 2002 to 2012. Using the time dimension, as opposed to running cross-section regressions, helps us to better explore the information provided by the unfolding of the business cycle.

The rest of the paper is organized as follows. The next section presents the data set and provides the rationale for considering each class of indicators for competitiveness assessment. Section 3 presents the methodology and Section 4 discusses the results. Sections 5 and 6 perform various robustness checks and the last section concludes.

2 Potential drivers of external competitiveness

The concept of competitiveness is broad, encompassing among other aspects export performance, productivity, quality of institutions and governance, ability to innovate and absorb technology. Consequently, the potential drivers of competitiveness can be searched in very wide areas of economics.

The first conceptual step consists in choosing the dependent variable. Here we narrow down our definition to the international trade dimension, defining competitiveness as a measure of a country's advantage or disadvantage in selling its products in international markets.[2] More specifically, we define the dependent variable as the growth rate in the

[2]See the OECD's definition of competitiveness in international trade:

market share of nominal exports of goods and services.[3] There are several reasons behind this choice. First, export market shares summarise various aspects of competitiveness, as increasing labour productivity or improving quality of government institutions are likely to be reflected in export performance of a country. Second, data on nominal exports is timely and harmonized across countries, whereas other candidate variables, such as the quality of institutions, can be defined very differently across countries.

While constructing the set of explanatory variables for the market share of nominal exports, we considered the following criteria: (i) economic relevance, (ii) data availability, i.e. comparable statistics for EU25 over the period 2002–2011 (2003–2012 for the dependent variable) and (iii) comprehensiveness, i.e. all possible economic pillars that are commonly correlated with external competitiveness and arguably influence it feature in the dataset through key indicators. Correlated variables proxying for the same effects were not included, as the BMA methodology performs poorly in terms of model convergence when regressors are highly correlated. For instance, the two indicators introduced by Koopman et al. (2010), namely participation and position in global value chains, are correlated by construction, so only one of them was included. Finally, most of the considered regressors are structural variables likely to capture fundamental drivers of competitiveness, but we also include several indicators linked to business cycle fluctuations. In speaking about "drivers" it is important to keep in mind that our methodology aims at detecting systematic empirical regularities, but precisely identifying causal relationships would require a more structural approach that cannot handle this amount of data. With this caveat in mind, we use the term "driver" to refer to variables that are detected as being systematically correlated with increases or decreases in export competitiveness when conditioning on a very rich information set.

The final dataset comprises 42 explanatory variables that capture relative price and cost measures, trade specialisation, macroeconomic environment, institutions and business environment, as well as financial and labour markets developments. Most of the variables from the first two blocks (relative prices and trade specialisation) are novel indicators computed by the ESCB Competitiveness Research Network (Karadeloglou et al. (2015)). The next three blocks include variables that are traditionally used in the analysis of a country's competitiveness position as well as in growth literature.[4] Following the increased attention on financial markets following the recent international crisis, we also add a set of variables characterizing the financing conditions for non-financial corporations.

The main categories of potential competitiveness drivers are discussed below (see Table 1 for names of variables, sources and data transformations and Table 2 for descriptive statistics).

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http://stats.oecd.org/glossary/detail.asp?ID=399.

[3] Arguably, export performance in goods and in services may be driven by different factors. However separate data on services exports are not as available and reliable, so we look at total exports. Furthermore, the use of nominal export markets shares (instead of real market shares or real export growth) has a long tradition in the literature; see e.g. the work of Armington (1969)

[4] See e.g. Durlauf et al. (2005), Moral-Benito (2012) and Danquah et al. (2014).

Relative price variables

Real effective exchange rates (REER) are the most widely discussed determinant of competitiveness. The history can be traced back to Armington (1969), who decomposed the change in a nominal trade flow into two components: changes in demand and changes in relative prices. Later, McGuirk (1987) used this framework to construct a rudimentary REER indicator. Since then, a large number of REERs or HCIs (Harmonized Competitiveness Indicators) have been constructed based on various price indices and different weighting schemes.

We consider the HCI using consumer prices as deflator and investigate the robustness of the results compared to the HCIs deflated by unit labour costs for the total economy. The HCIs are considered in turn and not simultaneously in a single model, due to their high correlation.

Next to the traditional HCIs we also look at the growth in relative export prices (RXP) adjusted for quality and taste (see Benkovskis and Wörz (2016)). RXP indices are based on disaggregated UN Comtrade data and measure both price and non-price competitiveness, as they are constructed to capture changes in the physical quality of export products and shifts in consumers' taste, factors which are missing in the traditional HCIs.

Trade related variables

This block of variables consists of various statistics that are informative for trade outcomes, computed based on detailed trade data from UN Comtrade and from the newly developed World Input-Output Database (WIOD, see Stehrer et al. (2014)). These indicators have been developed within CompNet and although some of them have a long standing history in economic literature (e.g. indices of revealed comparative advantage – RCAs), they make use of the most detailed sector/partner trade statistics and are computed in a harmonized fashion across countries (see Karadeloglou et al. (2015) for more details). These variables capture several dimensions, i.e. competitive pressure, revealed comparative advantage, and internationalisation of production.

Export gains are driven not only by local conditions determining firms' ability to export, but also by the degree of competition in external markets. This effect is proxied by the dynamic trade link analysis proposed by Silgoner et al. (2013) and used by Benkovskis and Wörz (2016) to assess whether the competitive pressure from China poses a serious threat for EU exporters in third markets. We include three variables capturing competitive pressures from rapidly developing China, namely existing overlap with China, new overlap with China and potential crowding out. The existing overlap indicator evaluates the share of product-destination markets simultaneously and continually served by two competing exporters (EU country and China). In other words, it shows how often both countries overlap on third markets. By contrast, the new overlap indicator focuses on those cases where one of the exporters (EU country or China) enters the market served by another exporter. Finally, the potential crowding-out indicator describes cases when either the EU country or China leaves a market while the other competitor remains active or has just become active. Thus, these three variables provide

useful information on competitive pressures from China and may explain changes in EU countries' export market shares.

Regarding trade specialisation, we are also interested in whether export performance is driven by specialising in a certain category of goods. To this purpose we include two indices of revealed comparative advantage (as introduced by Balassa (1965)), namely RCAs for exports of high-tech and medium-tech products. The indices are computed following the OECD classification; high-technology sectors include industries such as aircraft, computing machinery, communication equipment, whereas medium-high technology sectors refer to industries such as electrical machinery, motor vehicles and chemicals. While high-tech can be thought of as providing higher value added and market power, concentration in medium-high technology exposes a country to a faster-growth external market.

Finally, external competitiveness is likely to be influenced by the degree of internationalisation of production, which allows a country to increase efficiency by outsourcing or to easily ensure demand for exports by taking part in Global Value Chains (GVCs). These aspects are extremely relevant, as the production process has become increasingly fragmented across countries and intermediate goods cross borders multiple times, reducing the reliability of traditional trade statistics as a measure of country's competitiveness. Thus, we include an indicator introduced by Koopman et al. (2010), namely the position in global value chains (GVC), computed using the WIOD data. The position in the global value chain is defined as the log ratio of a country's supply of intermediates used in other countries' exports to the use of imported intermediates in its own production. It captures a country's position (i.e., upstream or downstream) in the production chain. A higher value indicates that a country operates upstream in the GVC, e.g. specialising in raw materials or R&D, while a lower value indicates that a country operates downstream, e.g. in final assembly. It is possible that the level of export market shares is driven by changes in fragmentation of production, thus changes in GVC position are also included into the set of explanatory variables.

Macroeconomic variables

We include ratios describing the structure of the economy: investment and government consumption ratios to GDP, which is usually considered to be a measure of distortions in the economy (see e.g. Barro (1991)). This is complemented by a measure of the tax burden[5] and public debt ratio to GDP.

Given that both capital stock and the build-up of productive capacities may have a positive impact on export performance, we also include real investment growth to complement the share of investment in GDP. As a proxy for the importance of the non-tradable sector in the economy, we control for the structure of investment by including the share of investment in construction. Another variable capturing the business cycle is the so-called growth surprise, or the difference between the actual growth rate of real GDP and the five-year ahead forecast entailed in the IMF World Economic Outlook.

[5]Our measure of tax burden follows the definition used in the Stability and Convergence Programmes submitted by the EU Member States.

Productivity is a key variable in competitiveness analysis and competitiveness is often discussed as a quasi-synonym of productivity (see Porter (1990) or Krugman (1994)). We include the TFP measure from the AMECO database, calculated as the Solow residual in a production function. However, one needs to be cautious when interpreting the results for the TFP measure: it is unobservable and varies with the estimation method. Moreover, the Solow residual may include cyclical factors related to the utilization of production factors. Thus, we also include labour productivity growth, which is observable.

Finally, one also needs to take into account the importance of natural resources in determining competitiveness; we augment the set of explanatory variables by the share of rents from natural resources to GDP and the ratio of energy imports to use of primary energy.

Labour market and demographic variables

The external performance of a country is tightly connected with the quality of human capital and the structure of the labour market. In particular, the share of labour force with secondary and tertiary education, as well as the index of human capital provided by the Penn World Tables capture the skill endowment of the labour force. The availability of the labour force is described by labour demographic conditions (population growth and age-dependency ratio), and labour force participation rate. The flexibility of the labour market may also play an important role in determining competitiveness, thus we include the share of temporary and part-time employment as explanatory variables.

Institutions and business environment

The quality of government institutions and of the business environment has a crucial role for a country's competitiveness; policies which promote more flexible product and factor markets, reducing costs of entry and exit, may foster more efficient allocation of resources towards more productive activities. The data set includes indices provided by the Fraser Institute, namely size of the government, quality of legal system, regulations and freedom to trade and also Worldwide Governance Indicators (WGI) that measure the severity of corruption and government efficiency.

Financial variables

Since the onset of the crisis, financial variables have gained prominence in explaining the performance of firms and of countries. We consider measures characterizing firms' financing conditions including loans to non-financial corporations and their liability structure (equity, debt, loans). In addition, we look at the effect of FDI inflows which also proxy international technological spillovers. Finally, accounting for the globalization of the financial sector, we include the growth of loans from foreign banks.

3 Methodology

Given the all-encompassing nature of the concept of competitiveness and the lack of clear guidance from economic theory on what drives it, the degree of uncertainty regarding the *true* model is significant. We employ BMA to identify robust drivers of trade outcomes, as the methodology allows us to account for both the uncertainty associated with the importance of each driver conditional on a given model and for the uncertainty surrounding the specification of the model.

More precisely, BMA provides a formal treatment of model uncertainty by considering all possible combinations of indicators; when k potential variables are considered, there are 2^K variable combinations, which means estimating 2^K models. Under the BMA approach, the importance of each variable can be assessed by aggregating information regarding that variable from all possible models (unconditional statistics), or alternatively, only from models which contain that variable (posterior statistics conditional on inclusion). The weights are given by the posterior model probabilities (henceforth PMP).

The literature that deals with model uncertainty when there is little guidance from economic theory regarding which explanatory variables to consider goes back to Raftery (1995). Each model is defined by the specific subset of variables it includes and is treated as an unknown parameter that lies in the set of models entertained (the model space). Bayesian inference offers the tools to attach probabilities to the different possible models. Raftery (1995) showed that when there are many candidate independent variables, standard model selection criteria based on p-values can be misleading and he promoted the use of Bayesian inference to take into account model uncertainty explicitly.

Sala-i-Martin et al. (2004) investigate the drivers of economic growth following the approach of Raftery (1995) and take into account model uncertainty by applying Bayesian inference on the posterior odds of each model; the models consist in all possible combinations of the considered explanatory variables. The methodology has since been known as Bayesian Averaging of Classical Estimates (BACE), as the models are estimated using classical OLS and the weights given to each model have a Bayesian justification similar to the Schwarz model selection criterion.

Fernandez et al. (2001a) lay the ground for a full BMA approach to deal with model uncertainty by proposing a benchmark prior distribution both for the models and the parameters within each model. More precisely, they propose to use improper non-informative priors for the parameters that are common to all models and a g-prior structure for the slope. This hierarchical prior structure has gained popularity in the literature, mainly because it is analytically convenient and is has a small computational burden. It has been frequently employed in subsequent analyses of drivers of economic growth (see Fernandez et al. (2001b)).

The above-mentioned studies use cross-section data, whereas Moral-Benito (2012) extends the BACE approach to a dynamic panel framework by employing a novel maximum likelihood estimator. He shows that the set of robust growth drivers changes substantially when country-specific effects correlated with other regressors are included. Danquah et al. (2014) employs the same methodology to analyze drivers of TFP and find

that country-specific unobserved heterogeneity is its most important one. Only three variables robustly appear as drivers of productivity, namely initial GDP, consumption share and trade openness.

Using the sample of Sala-i-Martin et al. (2004) containing 64 potential growth determinants, Ciccone and Jarocinski (2010) investigate the sensitivity of results for two different available estimates of income, which is the dependent variable. They use BMA with agnostic priors and show that the results are highly sensitive to how income is estimated. They suggest that when the indicator set is too vast, results are likely to be non-robust to minor errors in measurement in the dependent variable. Therefore,we keep the set of potential export drivers rather parsimonious in our analysis, as results can be sensitive when the number of included variables is too large.

We consider a static panel taking into account uncertainty about which subset of variables $x_j \in x$ is included in each model. We define the following econometric specification for each model M_j:

$$y_{it} = \alpha_j + x'_{j,it-1}\beta_j + \gamma_{j,i} + \nu_{j,t} + \epsilon_{j,it} \quad \forall t = 1, ..., T \quad i = 1, ..., n \quad j = 1, ..., 2^k \tag{1}$$

where the dependent variable y_{it} is the growth in export-market share for country i, α_j is a constant term,$\beta_j \in \Re_{k_i} (0 \leq k_i \leq k)$ groups the relevant regression coefficients, $\gamma_{j,i}$ captures unobservable time-invariant country heterogeneity, $\nu_{j,t}$ is a time-fixed effect to control for common factors across countries, and $\epsilon_{j,it}$ is a Gaussian IID error term with variance σ^2. The imposed lagged response of trade outcomes to our set of competitiveness drivers addresses the problem of reverse causality and accounts for delayed effects from the explanatory variables.

In addition to model uncertainty, we are also confronted with substantial uncertainty surrounding the correct econometric specification. In order to address this type of uncertainty, we estimate five different versions of equation (1). First, we impose $\gamma_{j,i} = 0$ and $\nu_{j,t} = 0$, which is equivalent to pooled OLS. Next, we consider a model with only country-fixed effects ($\nu_{j,t} = 0$), where country-fixed effects are included via within transformation of variables. Another set of results is based on a model with country-fixed effects (via within transformation) and time dummies, and finally we estimate a model with country-fixed effects and time-fixed effects. Notice that we treat time dummies as normal regressors and hence the inclusion of dummy variables allows us to investigate the empirical relevance of time-fixed effects, while introducing fixed effects via variable transformations assumes the presence of fixed effects a priori.

The model weights ($p(M_j|y, X)$) are posterior model probabilities that arise from Bayes' theorem:

$$p(M_j|y, X) = \frac{p(y|M_j, X)p(M_j)}{p(y|X)} = \frac{p(y|M_j, X)p(M_j)}{\sum_{s=1}^{s=2^k} p(y|M_s, X)p(M_s)}. \tag{2}$$

where $p(y|M_j, X)$ is the marginal likelihood of model M_j, $p(y|X)$ is the integrated likelihood, and $p(M_j)$ is the model prior. The marginal likelihood $p(y|M_j, X)$ is obtained as follows:

$$p(y|M_j, X) = \int p(y|\alpha_j, \beta_j, \sigma, M_j)p(\alpha_j, \sigma)p(\beta_j|\alpha_j, \sigma, M_j)d\alpha_j d\beta_j d\sigma, \tag{3}$$

where $p(y|\alpha_j, \beta_j, \sigma, M_j)$ is the conditional probability of the data, $p(\alpha_j, \sigma)$ and $p(\beta_j|\alpha_j, \sigma, M_j)$ are the priors for the parameters of model M_j. The posterior model probability in (2) is thus proportional to the marginal likelihood of the model (the probability of the data given the model M_j) and a prior model probability $p(M_j)$.

The posterior distribution of any quantity of interest, say Δ, is an average of the posterior distributions of that quantity under each of the models which include that variable, with weights given by the posterior model probabilities, as follows:

$$p(\Delta|y, X) = \sum_{j=1}^{j=2^k} p(\Delta|M_j, y, X)p(M_j|y, X) \tag{4}$$

Expression (4) gives the posterior distribution of parameters such as the regression coefficients, where $p(\Delta|M_j, y, X)$ denotes the posterior distribution of Δ conditional on model j and the data.

In order to apply the BMA procedure described above, we need to specify priors for both the generic model M_j and for the model's parameters α_j, β_j and σ.

For the parameters which are common across all models we assume complete uncertainty where the prior is located, i.e. intercept and variance are characterized by 'improper' priors with $p(\alpha) \propto 1$ and $p(\sigma) \propto \sigma^{-1}$.

Regarding the slope coefficients β_j we follow the natural-conjugate g-prior specification of Zellner (1986) assuming a normal density with zero mean and prior covariance matrix defined as $\sigma^2 g(X_j'X_j)^{-1}$, which is proportional to the posterior covariance of the sample $(X_j'X_j)^{-1}$. The hyper-parameter g captures the uncertainty related to the coefficients being indeed zero: a small g implies a small coefficient variance and a higher confidence on the coefficient being zero. The opposite is true when g is large. The conditional prior on β_j is formally defined as:

$$\beta_j|\sigma^2, M_j, g \sim N(0, \sigma^2 g(X_j'X_j)^{-1}) \tag{5}$$

We depart from the popular choice of fixed g-priors used in previous studies (for a comprehensive overview on different prior structures used in the context of model uncertainty see for instance Moral-Benito (2015)). As emphasized by Liang et al. (2008) and Feldkircher and Zeugner (2009), posterior results depend substantially on the researcher's prior choice under a fixed g-prior, essentially ignoring the true underlying data generating process. In particular, Feldkircher and Zeugner (2009) provide extensive Monte Carlo evidence on the performance of different g-priors under different degrees of noise in the data. The results confirm the superior performance of data-dependent g-priors over fixed g-priors, i.e. flexible g-priors tend to reflect the information content in the data with respect to the dependent variable more accurately, as indicated by an adjustment of the average posterior shrinkage factor.

In line with the above mentioned study, we use a model specific g-prior which adapts to the data. In particular, we follow an "Empirical Bayes – Local" (EBL) approach to elicit g depending on the information contained in the data. Therefore, a separate g

is estimated via maximum likelihood for each model. Under this approach, the model-specific EBL prior amounts to:

$$g_j = \max(0, F_j - 1) \tag{6}$$

where $F_j = \frac{R_j^2(n-1-k_j)}{(1-R_j^2)k_j}$ is the standard OLS F-statistic of model M_j, R_j^2 is the associated R-squared of model M_j, n is the number of observations in the dataset, and k_j is the number of covariates for model M_j.

An additional advantage of the EBL prior is that the posterior distribution of the shrinkage factor allows for an interpretation in terms of model fit. The expected value of the shrinkage factor is equal to $1 - 1/\hat{F}_j$, where $\hat{F}_j$ is the adjusted OLS F-statistic for model M_j. Therefore, an average posterior shrinkage factor of close to one indicates that the posterior results can explain a large fraction of the variation in the data.

Finally, we need to specify a prior distribution over the space $\mathcal{M}$ of all 2^k possible models. We assume a beta-binomial prior distribution over the model space which constitutes a popular choice in the related literature. Under this model prior, each variable enters a model independently of all other variables in line with a binomial distribution of prior model probability. The prior expected model size ($E(\bar{m})$) depends on the number of covariates k and the prior inclusion probability for each variable (θ). Since expected model size is $E(\bar{m}) = k\theta$, the prior inclusion probability can be defined by fixing prior expected model size $E(\bar{m})$. Under the beta-binomial prior θ is treated as a random variable following a beta distribution with mean and variance to be fixed by the researcher. This assumption induces prior model mass to be less concentrated around expected prior model size, essentially reflecting the researcher's prior uncertainty about model size. In particular, we implement the 'random θ' prior proposed by Ley and Steel (2009).[6] Moreover, we follow Sala-i-Martin et al. (2004) in imposing a rather small prior expected model size of 7, as we do not want to form strong beliefs that the number of included variables should be large. Given our set of 42 independent variables, the resulting prior inclusion probability of each regressor is about 0.16.

With 42 possible regressors, the number of models to be estimated is enormous. Since it is infeasible to compute the posterior distributions of all models, we use Markov Chain Monte Carlo (MCMC) samplers that visit the model space and keep the models with higher posterior probabilities. The number of times each model is kept is used to approximate the posterior model probability. The degree of convergence of the MCMC sampler towards the true analytical solution is indicated by the correlation between the sampling PMPs and true PMPs for the top 100 models. The empirical results are based on 9 different sampling chains in order to improve convergence of the MCMC sampler to the true PMP distribution.[7]

Another source of model uncertainty is related to the functional form of the panel model; it is not clear a priori whether time and/or fixed effects should be included.

[6] The 'random θ' prior defines the hyper-parameters mean (a) and variance (b) of the beta distribution as follows: $a = 1$ and $b = (K - E(\bar{m}))/E(\bar{m})$.

[7] Computations are performed using the R-package BMS (Feldkircher and Zeugner (2009)). Each sampling chain consists of one million iterations using 500,000 burn-in points.

On one hand, including country and time fixed effects diminishes the omitted variable problem: By including country fixed effects we would take into account unobservable time-invariant country-specific characteristics such as cultural differences. On the other hand, including fixed effects makes interpreting the results more difficult for the variables that vary very little across time in each country, such as corruption control or regulatory quality. In other words, we will not capture the effect of better corruption control in country A comparing with country B, but will limit ourselves to the effect of changes in corruption control over time (which are marginal in most cases).

4 Results

The results are based on estimating the panel models over the 2003–2012 period for 25 EU countries (excluding Croatia, Malta and Luxembourg due to limited data availability). To address cross-country heterogeneity in terms of the structure of the economy, the sample of countries is split in two groups: old EU Member States and new EU Member States.[8] We report results from alternative specifications in Table 3 (old EU members) and Table 4 (new EU members).

An important measure of the relevance of each indicator in explaining trade outcomes is the posterior inclusion probability (PIP), which quantifies for each indicator the probability of being included in the true model and is computed as the sum of posterior model probabilities for all models which contain the relevant variable (all statistics are conditioned on the variable being included in a model). We label in bold variables as robust if two criteria are simultaneously met: (i) PIP should exceed the prior inclusion probability, which in this case roughly equals 0.17 given a prior model size of 7 and (ii) the ratio of conditional posterior mean to conditional posterior standard deviation is larger than 1.65 in absolute value, corresponding to a 90 percent coverage interval under Gaussian posterior parameter distribution (similarly, a 95 percent coverage interval was employed by Sala-i-Martin et al. (2004)).

While most of the previous studies choose ex-ante a benchmark specification, we analyse robustness of results by looking across various specifications of the panel models in terms of the inclusion of country and time fixed effects. Although there are some differences according to the type of panel model employed, the comparison of results from alternative model types lead to some broad conclusions. Note that some of the year dummies are highly significant for both country groups. The time dummy variables explain a decline in export market shares in 2003–2005, possibly due to the integration of China and of the new EU Member States in global trade and a subsequent worsening of trade outcomes during the financial crisis.[9]

We take as reference the results from the panel with country fixed effects, in the

[8]The old EU Member States group includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Sweden, Spain, the UK. The new EU Member States group includes Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia.

[9]Both effects are more clear-cut for old Member States.

second vertical pane of each table. The variables are ordered by decreasing posterior inclusion probability in this model. We also report the ratio between the posterior coefficient estimates and its standard deviation, and we refer to ratios higher than about 1.7 as "significant", though significance does not strictly have a meaning in a Bayesian setting. For both old and new Member States, competitive pressures from rapidly developing China strongly affect external competitiveness. In the case of old EU Member States, this is by far the most important factor that limited the increase in market shares over this sample (together with the weight of debt in total liabilities, possibly as a factor hindering the expansion of long-term investment), while investment, available liquidity to firms and regulatory quality appear to play a stimulative role for export outcomes. There is a considerable degree of heterogeneity within the EU in terms of drivers of external performance between new and old EU members. In particular, we find that the performance of new Member States depends more on labour and TFP growth and on inflows of foreign direct investment. These are also important for old Member States, for which, somewhat counter-intuitively, institutional quality variables are also more important (freedom to trade, but also regulatory quality and legal system variables come close to the significance threshold when country fixed effects are taken into account).

Our findings suggest that some of the novel indicators recently developed by the ESCB Competitiveness Research Network (CompNet) are robust drivers of export performance. For instance, the existent overlap with China decreases export market shares both for new and old EU Member States. Thus, having similar specialization to China appears to be harmful for the growth of exports irrespective of the country group. This effect is robust to changes in model specifications for new EU Member States. The disruptive impact of the integration of China on the expansion of market shares of old EU Member States may also be behind the result that appears when introducing time fixed effects into the picture: the dummies for 2003 and 2004, years when China was erupting in world trade, catch most of the explanatory power. The dummy for 2004 is also significant for the new Member States, but the importance of labour productivity remains very high. In this specification, the change in GVC position also has a positive and significant effect on export market shares of the new EU Member States. Positive changes in GVC position can be interpreted as movement upstream in the value chain, for example the shift from a final assembly to earlier stages of production like R&D or intermediate inputs. Thus, our results suggest that moving upstream the value chain improves the growth of export market share for new EU members.

The RCA in high-tech industries appears to negatively affect the export growth of the new EU Member States, robustly across the pooled and fixed-effects specifications of the model. We attribute this negative relationship to the fact that, according to the OECD classification, high-tech industries include sectors such as aircrafts, computing machinery, communication equipment, etc., whereas the new Member States have managed to gain market share by concentrating in other sectors, such as machinery and electric equipment, where more gross value is generated.

As to traditional drivers of export market share changes, we found a positive and significant effect of labour productivity growth on export market share changes for new

EU Member States. This effect is highly robust across three model specifications. According to Table 3, some specifications of the model also point to a positive link between labour productivity and exports for old EU members, but it is not as pronounced as in the case of new members. The performance of EU countries on the foreign markets appears to be positively driven by the share of investment in GDP, while we did not find dependence between investment and market shares for new EU countries. This can be explained by the parallel finding that foreign direct investment is very important for these countries: i.e. export capacity seems to have been financed by FDI rather than by domestic investment. Given the importance of the investment ratio for more mature economies, one could talk of stages of export power construction, from foreign-driven to domestic-driven. The importance of both TFP and labour productivity growth also speaks to a "catching-up" story.

Institutional factors are commonly considered to also play an important role in determining a country's success on foreign markets. The lack of barriers to exports, as captured by freedom to trade, positively impacts export performance of old EU countries. (see Table 3, all specifications). By contrast, these variables do not seem to make a difference when the reference group is the smaller subset of new EU Member States.

Different financial variables are important drivers of export performance for the two sets of countries. For the new EU Member States the important role of foreign capital is captured by the positive and significant sign of real FDI liabilities growth. For old Member States, a higher amount of loans to non-financial corporations is associated with market share gains.

A special policy focus is often placed on measures of price and cost competitiveness indicators. Results in Tables 3 and 4 suggest a negative elasticity of export market share growth to movements in CPI based HCI in both sets of countries. However, the dispersion of the value is relatively high and PIP is small in most cases, which questions the robustness of the effect. For the new member States, quality-adjusted export unit values are much more important (see Benkovskis and Wörz (2013) for a description of this indicator, as well as Benkovskis and Wörz (2012) and Benkovskis and Wörz (2016) for more detailed analyses of non-price factors in the export performance of emerging economies).

5 Robustness

Summary statistics of posterior results are presented in Tables 5 and 6. Across most specifications, we obtain a high degree of sampler convergence for both subsamples given a correlation coefficient of close to one between sampling and analytical PMPs, while noticing that convergence is somewhat unsatisfactory for the sample of old EU Member States in the case of pooled OLS. The posterior model mass covered by the top 100 models is relatively low for all specifications, providing a rationale for model averaging rather than model selection. In line with our prior assumptions on model size, the posterior model size is relatively small, i.e. between 7 and 10 for old EU Member States and between 5 and 11 for new EU Member States. The evidence in favour of

rather parsimonious models is visualised in Figures 1 and 2, which illustrate the set of indicators included in the top 100 models ordered by their posterior model probabilities. The two images also confirm that for a given variable the signs of posterior means remain strongly stable across models as indicated by the same colour.[10] In terms of model fit, average posterior shrinkage statistics show a somewhat better fit of the data for the new Member States compared to old Member States.

In addition to analysing results across various model specifications according to the inclusion of time and country fixed effects, we evaluate the robustness of our results across two other dimensions: the chosen g-prior and the chosen price/cost competitiveness measure. First, we assess the sensitivity of PIP-rankings and posterior mean coefficients to two fixed g-priors commonly used in the literature, namely the unit information prior (UIP) and the so-called benchmark- or BRIC-prior. Under the UIP the hyperparameter g equals the number of observations in the dataset, inducing the Bayes factor to mimic the behaviour of the Bayesian information criterion (for further details see for example Kass and Wasserman (1994)). The BRIC prior put forward by Fernandez et al. (2001b) bridges the Bayesian information criterion and the risk inflation criterion where it is recommended to set $g = max(n, k^2)$, where n corresponds to the number of observations and k is the number of regressors. Tables 7 and 8 provide evidence on the robustness of the posterior results to the elicited g-priors, by displaying the PIP-rankings for the three alternative prior specifications (EBL, UIP, BRIC). The main message is that PIP rankings are much more variable across g-priors for the old Member States. However, most PIPs remain above their corresponding prior inclusion probabilities for the variables which have been found often selected and significant under the benchmark prior setting.

We complete the robustness analysis by looking at the sensitivity of PIP rankings when using the EBL prior to the inclusion of a different indicator of price and cost competitiveness, namely real effective exchange rate deflated using ULC for the total economy (HCI-ULC) (see Tables 9 and 10). For both the old and the new Member States, there is little variation in the PIP rankings when changing the measure of price/cost competitiveness.

6 Jointness

A usual issue of concern in regressions with many predictors relates to the problem of highly collinear variables. We shed light on this aspect by computing the jointness measure proposed by Ley and Steel (2007), which allows us to characterize the degree of bivariate dependence between two variables.[11] Formally, the jointness measure J_{ij} is defined as the posterior odds ratio of models including both variables i and j versus

[10] Red indicates a negative posterior mean and blue a positive one.

[11] Note that an alternative jointness measure is presented by Doppelhofer and Weeks (2009). We restrict our analysis to the jointness statistic by Ley and Steel (2007) as their measure is also well defined for cases where one of the regressors is included in all or none of the models.

models which include them only separately:

$$J_{ij} = \frac{P(i \cap j)}{P(i) + P(j) - 2P(i \cap j)} \tag{7}$$

where $P(i)$ denotes the posterior inclusion probability of regressor i and $P(i \cap j)$ denotes the posterior model probability of including both variables i and j, defined by the sum of the posterior probabilities for all models that jointly contain these variables.

Higher values of jointness imply that variables tend to enter the visited models jointly and therefore capture distinct effects. These regressors act as complements in the sense that each captures a different aspect in explaining the dependent variable. By contrast, a low value of jointness, also referred to as disjointness, provides evidence on collinearity among regressors which tend to capture similar effects essentially acting as substitutes for each other. These variables should not be included jointly in a model. Our jointness results are based on the sampling PMPs of the 100 top models. We follow Ley and Steel (2007) in defining the cut-off values for different degrees of jointness (see also Jeffreys (1961)). According to these cut-off values the highest degree of disjointness (decisive disjointness) implies that the posterior model mass of models, including regressors i and j only individually, is at least 100 times as much as for those models containing both regressors. Figures 3 and 4 provide an overall picture on the presence of jointness/disjointness among our set of regressors by plotting the log of the posterior odds ratio for all pairs.[12]

Evidently, the majority of variable pairs experiences moderate to strong degrees of bivariate disjointness. These figures show the distribution of disjointness counts across different degrees of disjointness. For both country groups, almost all pairs display some degree of disjointness.[13]

Broadly in line with the findings by Ley and Steel (2007), very strong degrees of disjointness predominantly occur among variable pairs with low PIPs. One notable exception for new Member States is very strong disjointness among New Overlap with China and Potential Crowding-Out from China, which are indeed likely to proxy for similar effects. In contrast to Ley and Steel (2007), we do not find any evidence for decisive disjointness in our dataset. This suggests that collinearity problems do not seem to be a major issue of concern among our variable set, enhancing further the robustness of our reported posterior results.

7 Conclusions

This paper looks at systematic empirical correlations between export market share growth and variables commonly discussed as drivers of external competitiveness, exploring the space of all combinations of these variables. Our information set covers various

[12] The jointness analysis in this section refers to a model with country-fixed effects only. Jointness results for our other model specifications are available upon request.

[13] Note that it is not uncommon to find a high share of regressor pairs to display some degree of disjointness. For example, Ley and Steel (2007) find shares of 92.3 per cent and 99.1 per cent for the two datasets they analyse.

economic and institutional pillars and investigates their link with trade outcomes by building on the growth literature that deals with model uncertainty.

Several model specifications are considered, but the expansion of export market shares is linked to different factors in the old and in the new Member States, with one exception: for both old and new EU Member States, competitive pressures from rapidly developing China strongly affected export performance since the early 2000s. In the case of old EU Member States, investment, quality of institutions and available liquidity to firms also appear to play a role for trade outcomes. For the new EU Member States, labour and total factor productivity are particularly important, and export market share growth is sustained by inward FDI rather than by domestic investment. In both sets of countries, price competitiveness does not seem to play a very important role. Relative export prices do show some consistent correlation with export performance for the new Member States, but only when they are adjusted for quality.

Overall, the BMA-based evidence supports the usefulness of the newly developed CompNet indicators as explanatory variables of changes in export market shares. These indicators make use of detailed six-digit product level data (HS classification, about 5,000 product categories), using as raw data the UN Comtrade database compiled by the UN Statistics Division. Such a high level of disaggregation allows going beyond the simple analysis of aggregate costs and market shares, and gives an opportunity to assess important aspects as competitive pressures.

Our analysis focuses on discovering empirical regularities, hence it can be hardly used as a platform for policy prescriptions. But a clear one does emerge: what sustains market share expansion changes according to the "maturity" of the exporting economy, with catching-up factors in terms of labour and total factor productivity being more important in emerging economies. Also, domestic investment and domestic financing has a central role in more advanced ones, while catching-up ones typically rely on inward FDI.

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Tables

Table 1: Data set description

Variable name	Source	Description
Relative Prices		
HCI-CPI	ECB	YoY, %
Relative export prices adj. for quality	CompNet, UN Comtrade	YoY, %
Trade specialisation		
Existent overlap with China	CompNet, UN Comtrade	Share of total trade links
New overlap with China	CompNet, UN Comtrade	Share of total trade links
Potential crowding-out (versus China)	CompNet, UN Comtrade	Share of total trade links
RCA in high-tech ind.	CompNet, UN Comtrade	OECD classification
RCA in medium-high tech ind.	CompNet, UN Comtrade	OECD classification
GVC position	CompNet, WIOD	Koopman et al. (2010)
Change in GVC position	CompNet, WIOD	First difference in GVC position
		to use of primary energy
Macroeconomic environment		
Government consumption (% of GDP)	AMECO	Based on current prices
Investment (% of GDP)	AMECO	Based on current prices
Investment growth	AMECO	YoY, %
Share of construction in investment	AMECO	Based on current prices
Tax burden	Eurostat	(Indirect, income and capital taxes
		+ Social contributions)/ GDP
Public debt (% of GDP)	AMECO	General government
		consolidated gross debt
Rents from natural resources	WDI	% of GDP
Energy imports (% of energy use)	WDI	Ratio of energy imports
TFP growth	AMECO	YoY, %
Growth surprise	WEO	Difference in actual GDP growth rate
		and 5-year ahead WEO forecast
Labour market and demographic variables		
Labour force with secondary ed.	WDI	% of total labor force
Labour force with tertiary ed.	WDI	% of total labor force
Index of human capital	PWT	Years of schooling and returns to education
Labour force participation rate	WDI	Proportion of active population aged 15-64
% of temporary employees	Eurostat	Share in total number of employees
% of part-time employment	WDI	Share in total number of employees
Labour productivity growth	AMECO	YoY, %
Population growth	Eurostat	YoY, %
Age dependency ratio	Eurostat	Ratio of people younger than 15
		or older than 64 to those aged 15-64
Institutions and business environment		
Rule of law	WGI	Index from -2.5 to 2.5
Government effectiveness	WGI	Index from -2.5 to 2.5
Control of corruption	WGI	Index from -2.5 to 2.5
Regulatory quality	WGI	Index from -2.5 to 2.5
Size of government	Fraser Institute	Index from 0 to 10
Legal system and property rights	Fraser Institute	Index from 0 to 10
Freedom to trade	Fraser Institute	Index from 0 to 10
Patent applications to the EPO	Eurostat	Per million of inhabitants
Financial market variables		
Real FDI liabilities growth	EWN	YoY, % - CPI deflated
Loans growth	Eurostat	YoY, % - non-financial corporation
Loans from foreign banks growth	BIS	YoY, %
Equity (% of total liabilities)	Eurostat	Non-financial corporations, financial
		liabilities - shares and other equity
Debt (% of total liabilities)	Eurostat	Non-financial corporations, financial
		liabilities - securities other than shares
Loans (% of total liabilities)	Eurostat	Non-financial corporations, financial
		liabilities - loans

Table 2: Descriptive statistics of the variables

	Old EU Member States				New EU Member States			
	Mean	Standard Deviation			Mean	Standard Deviation		
		Total	Between-country	Within-country		Total	Between-country	Within-country
Export market share growth	-0.03	0.05	0.01	0.05	0.03	0.07	0.03	0.06
HCI-CPI	0.01	0.03	0.01	0.03	0.02	0.05	0.02	0.05
Relative export prices adj. for quality	0.01	0.03	0.01	0.02	-0.02	0.05	0.01	0.04
Existent overlap with China	0.59	0.07	0.02	0.06	0.58	0.07	0.05	0.05
New overlap with China	0.11	0.02	0.02	0.01	0.15	0.03	0.02	0.02
Potential crowding-out (versus China)	0.08	0.02	0.02	0.01	0.10	0.02	0.02	0.01
RCA in high-tech ind.	0.91	0.49	0.50	0.10	0.67	0.45	0.42	0.21
RCA in medium-high tech ind.	1.26	1.05	1.07	0.16	0.72	0.26	0.24	0.12
GVC position	-0.15	0.06	0.06	0.02	-0.20	0.06	0.05	0.02
Change in GVC position	0.00	0.01	0.00	0.01	0.00	0.02	0.01	0.02
Government consumption (% of GDP)	21.69	3.29	3.20	1.11	19.09	1.88	1.53	1.17
Investment (% of GDP)	20.30	3.22	2.43	2.19	23.86	4.42	2.92	3.42
Investment growth	0.00	0.09	0.02	0.08	0.04	0.15	0.04	0.15
Share of construction in investment	0.58	0.08	0.08	0.03	0.55	0.08	0.06	0.05
Tax burden	0.40	0.06	0.06	0.01	0.32	0.05	0.05	0.01
Public debt	66.60	27.27	24.93	12.75	34.26	20.00	19.07	8.16
Rents from natural resources	0.74	0.82	0.80	0.27	1.51	1.34	1.19	0.70
Energy imports	51.69	35.04	35.68	6.05	47.80	22.96	23.27	5.53
TFP growth	0.00	0.02	0.00	0.02	0.01	0.04	0.01	0.04
Growth surprise	-0.01	0.03	0.01	0.03	-0.01	0.05	0.01	0.05
Labour force with secondary ed.	42.56	12.00	12.27	1.81	62.41	10.37	10.70	1.57
Labour force with tertiary ed.	27.24	7.14	7.00	2.27	23.08	7.65	7.38	2.92
Index of human capital	2.95	0.21	0.21	0.05	3.09	0.19	0.20	0.04
Labour force participation rate	60.46	8.04	8.27	0.86	57.43	3.82	3.83	1.05
% of temporary employees	13.64	6.38	6.43	1.40	8.81	6.75	6.79	1.79
% of part-time employment	17.22	9.41	9.55	1.81	6.68	3.16	3.12	1.02
Labour productivity growth	0.01	0.02	0.01	0.02	0.04	0.04	0.02	0.03
Population growth	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01
Age dependency ratio	81.46	5.22	4.85	2.29	75.96	5.31	5.02	2.24
Rule of law	1.47	0.45	0.46	0.08	0.62	0.41	0.41	0.11
Government effectiveness	1.54	0.52	0.52	0.16	0.69	0.45	0.45	0.10
Control of corruption	1.56	0.69	0.70	0.14	0.38	0.42	0.42	0.12
Regulatory quality	1.44	0.34	0.33	0.11	0.97	0.30	0.29	0.10
Size of government	4.97	1.01	0.89	0.52	5.87	0.99	0.86	0.56
Legal system and property rights	7.76	1.03	1.00	0.35	6.20	0.70	0.64	0.33
Freedom to trade	8.44	0.41	0.27	0.32	7.96	0.46	0.33	0.33
Patent applications to the EPO	141.01	94.36	96.83	11.63	12.65	14.63	14.40	4.89
Real FDI liabilities growth	0.10	0.19	0.05	0.19	0.18	0.23	0.04	0.22
Loans growth	0.04	0.08	0.03	0.08	0.10	0.14	0.06	0.13
Loans from foreign banks growth	0.11	0.19	0.04	0.19	0.32	0.42	0.11	0.41
Equity (% of total liabilities)	0.51	0.09	0.08	0.05	0.52	0.09	0.08	0.05
Debt (% of total liabilities)	0.05	0.03	0.03	0.01	0.01	0.01	0.01	0.01
Loans (% of total liabilities)	0.37	0.09	0.08	0.04	0.35	0.10	0.09	0.04

Table 3: Estimation results for old EU Member States

Specification	Pooled OLS			Country Fixed effects (WG)			Country and time FE			Country fixed effects and optional time dummies		
Variable	PIP	Mean	Mean/St.dev.	PIP	Mean	Mean/St.dev.	PIP	Mean	Mean/St.dev.	PIP	Mean	Mean/St.dev.
Potential crowding-out from China	0.24	-0.11	-0.84	**0.86**	**-0.42**	**-2.71**	0.12	-0.17	-0.72	0.15	0.00	-0.01
New overlap with China	0.23	-0.11	-0.81	**0.70**	**-0.31**	**-2.53**	0.13	0.23	0.95	0.33	0.13	1.59
Debt (% of total liabilities)	0.21	-0.08	-0.84	**0.51**	**-0.17**	**-2.09**	0.16	-0.11	-1.52	0.19	-0.06	-0.85
Investment (% of GDP)	0.43	0.23	1.61	0.44	0.28	1.59	0.16	0.18	1.24	0.21	0.11	0.88
Loans growth	**0.56**	**0.17**	**2.14**	0.34	0.14	1.64	0.08	0.07	0.81	0.17	0.04	0.69
Change in GVC position	0.30	-0.12	-1.32	0.33	-0.15	-1.62	0.06	-0.01	-0.11	0.14	0.01	0.13
Regulatory quality	0.18	0.10	0.53	0.31	0.14	1.59	0.18	0.12	1.61	0.18	0.05	0.74
Labour productivity growth	0.35	0.15	1.43	0.31	0.17	1.51	0.09	0.08	0.76	0.15	0.02	0.26
TFP growth	0.33	0.16	1.07	0.25	0.20	0.97	0.13	0.19	1.05	0.16	0.05	0.48
Freedom to trade	**0.44**	**0.22**	**1.76**	**0.24**	**0.17**	1.25	**0.97**	**0.50**	**4.23**	0.30	0.12	1.43
Legal system and property rights	0.19	0.13	0.68	0.24	0.12	1.38	0.16	0.12	1.51	0.19	0.05	0.87
Size of government	0.21	-0.10	-0.91	0.23	-0.11	-1.26	0.07	-0.03	-0.41	0.14	0.00	-0.04
HCI-CPI	0.15	0.00	0.02	0.23	-0.11	-1.19	0.07	-0.03	-0.34	0.14	0.00	-0.08
Public debt (% of GDP)	0.21	0.15	0.76	0.22	0.19	0.83	0.09	0.11	0.60	0.17	0.07	0.61
Existent overlap with China	**0.52**	**-0.20**	**-1.86**	0.21	-0.20	-0.87	0.08	-0.11	-0.52	0.15	0.00	-0.04
Labour force with tertiary ed.	0.22	-0.09	-0.87	0.20	-0.14	-0.93	0.08	-0.09	-0.77	0.15	-0.01	-0.19
Energy imports (% of energy use)	0.17	0.06	0.45	0.19	0.09	1.11	0.06	0.00	0.03	0.15	-0.01	-0.10
Loans from foreign banks growth	0.19	-0.07	-0.71	0.19	-0.10	-1.05	0.16	-0.14	-1.42	0.18	-0.05	-0.77
GVC position	0.18	-0.06	-0.49	0.19	-0.10	-0.79	0.07	-0.04	-0.38	0.15	-0.01	-0.26
Control of corruption	0.17	0.05	0.20	0.19	0.09	0.99	0.07	0.05	0.62	0.16	0.03	0.41
Growth surprise	0.31	0.12	0.72	0.18	0.00	-0.01	0.08	-0.07	-0.27	0.15	-0.02	-0.24
Loans (% of total liabilities)	0.21	0.09	0.57	0.18	0.15	0.69	0.07	0.03	0.26	0.15	0.02	0.15
Labour force with secondary ed.	0.16	0.02	0.13	0.18	0.08	0.94	0.10	0.08	1.09	0.16	0.03	0.47
Age dependency ratio	0.17	0.01	0.08	0.16	-0.09	-0.77	0.11	-0.10	-1.14	0.17	-0.05	-0.63
Equity (% of total liabilities)	0.21	-0.07	-0.55	0.16	0.10	0.37	0.07	0.06	0.42	0.16	0.04	0.40
Real FDI liabilities growth	0.18	-0.06	-0.64	0.16	-0.07	-0.72	0.06	-0.01	-0.13	0.14	0.01	0.14
Share of construction in investment	0.17	-0.05	-0.38	0.16	0.04	0.32	0.11	0.09	1.10	0.18	0.06	0.72
RCA in medium-high tech ind.	0.18	-0.06	-0.38	0.16	0.06	0.75	0.06	0.00	0.04	0.15	0.02	0.34
Government consumption (% of GDP)	0.16	-0.02	-0.17	0.15	0.06	0.44	0.10	0.11	0.99	0.19	0.06	0.87
Investment growth	0.19	0.05	0.34	0.15	-0.05	-0.25	0.08	0.08	0.67	0.16	0.04	0.46
Tax burden	0.17	-0.04	-0.23	0.15	0.05	0.52	0.07	0.04	0.51	0.16	0.03	0.44
Relative export prices adj. for quality	0.31	-0.11	-1.41	0.15	-0.06	-0.72	0.06	-0.01	-0.17	0.14	0.00	-0.03
Index of human capital	0.17	0.05	0.41	0.15	-0.03	-0.18	0.06	-0.02	-0.13	0.15	0.00	0.01
Population growth	0.25	-0.13	-1.07	0.15	-0.06	-0.57	0.07	-0.03	-0.32	0.15	0.01	0.08
Rents from natural resources	0.16	0.00	0.00	0.14	0.06	0.68	0.09	-0.07	-1.02	0.17	-0.04	-0.59
% of part-time employment	0.17	-0.08	-0.39	0.14	-0.03	-0.31	0.07	0.03	0.32	0.15	0.01	0.14
Government effectiveness	0.18	-0.12	-0.61	0.13	-0.02	-0.20	0.07	0.04	0.47	0.15	0.02	0.37
Labour force participation rate	0.17	0.10	0.47	0.13	-0.01	-0.05	0.06	0.01	0.12	0.15	-0.01	-0.14
Rule of law	0.16	0.03	0.10	0.13	-0.02	-0.21	0.06	0.00	-0.01	0.15	-0.01	-0.18
Patent applications	0.17	-0.03	-0.17	0.13	0.00	0.00	0.06	-0.02	-0.32	0.15	0.01	0.19
% of temporary employees	0.18	0.05	0.49	0.13	0.01	0.16	0.06	-0.03	-0.39	0.15	-0.01	-0.19
RCA in high-tech ind.	0.19	-0.05	-0.34	0.12	0.03	0.33	0.08	0.06	0.85	0.15	0.02	0.41
Time fixed effects												
2003							**0.87**	**-0.24**	**-3.22**			
2004							**1.00**	**-0.41**	**-4.40**			
2005							0.11	-0.15	-0.86			
2006							0.07	0.02	0.16			
2007							0.09	-0.10	-0.81			
2008							**0.88**	**0.25**	**2.94**			
2009							**0.86**	**-0.35**	**-3.53**			
2010							0.23	0.16	1.48			
2011							0.15	-0.08	-0.59			

Note: The Table shows BMA posterior results based on a beta-binomial model prior and an EBL g-prior. *PIP* refers to posterior inclusion probability; *Mean* and *St.dev* refer to the posterior mean and standard deviation of the coefficient estimates respectively. Country fixed effects are based on within-group data transformation.

Table 4: Estimation results for new EU Member States

Specification	Pooled OLS			Country Fixed effects (WG)			Country and time FE			Country fixed effects and optional time dummies		
Variable	PIP	Mean	Mean/St.dev.	PIP	Mean	Mean/St.dev.	PIP	Mean	Mean/St.dev.	PIP	Mean	Mean/St.dev.
Labour productivity growth	**0.80**	**0.34**	**3.24**	**0.70**	**0.31**	**3.19**	**0.39**	**0.19**	**2.04**	0.35	0.12	1.26
Existent overlap with China	**0.37**	**-0.25**	**-2.05**	**0.68**	**-0.35**	**-2.96**	**0.96**	**-0.57**	**-3.79**	**0.53**	**-0.22**	**-1.75**
Real FDI liabilities growth	**0.52**	**0.21**	**2.40**	**0.31**	**0.22**	**2.19**	0.18	0.15	1.36	0.30	0.09	1.07
TFP growth	**0.27**	**0.29**	**1.77**	**0.28**	**0.30**	**2.11**	0.22	0.20	1.29	0.24	0.05	0.37
RCA in high-tech ind.	**0.74**	**-0.31**	**-2.57**	**0.28**	**-0.22**	**-2.14**	0.24	-0.15	-1.54	0.27	-0.08	-0.79
New overlap with China	0.13	0.17	1.00	0.12	0.19	1.31	0.14	0.00	-0.02	0.24	-0.02	-0.16
Labour force participation rate	0.17	-0.16	-1.43	0.12	-0.14	-1.53	0.16	-0.10	-1.30	0.30	-0.09	-1.04
Relative export prices adj. for quality	0.18	0.13	1.58	0.12	0.13	1.54	0.09	0.04	0.47	0.22	0.02	0.27
Share of construction in investment	0.07	0.04	0.27	0.11	0.17	1.37	0.10	0.07	0.57	0.26	0.08	0.86
Loans from foreign banks growth	0.12	-0.12	-1.14	0.10	-0.15	-1.29	**0.36**	**-0.22**	**-2.00**	0.46	-0.15	-1.64
Tax burden	0.08	-0.01	-0.05	0.09	0.11	1.29	**0.53**	**0.20**	**2.41**	**0.55**	**0.19**	**1.88**
Labour force with tertiary ed.	0.09	-0.04	-0.24	0.08	-0.12	-0.63	0.12	0.18	0.77	0.26	0.09	0.77
Size of government	0.10	-0.10	-0.85	0.08	-0.11	-1.12	0.08	0.00	0.04	0.21	0.03	0.37
Patent applications	0.20	-0.16	-1.54	0.07	-0.10	-0.95	0.08	0.00	0.01	0.21	0.01	0.13
GVC position	0.07	-0.01	-0.06	0.07	0.09	1.03	0.10	0.00	-0.01	0.24	-0.03	-0.24
Growth surprise	0.09	-0.05	-0.26	0.07	0.04	0.20	0.11	0.05	0.27	0.21	-0.02	-0.14
Legal system and property rights	0.09	0.10	0.66	0.07	0.09	0.93	0.08	-0.03	-0.32	0.24	-0.06	-0.69
Investment (% of GDP)	0.08	-0.07	-0.62	0.06	-0.08	-0.74	0.13	-0.11	-0.90	0.31	-0.12	-1.03
Investment growth	0.07	0.02	0.20	0.06	0.08	0.59	0.14	0.11	0.89	0.22	0.03	0.31
Loans (% of total liabilities)	0.21	-0.19	-1.40	0.06	-0.10	-0.68	0.09	-0.05	-0.40	0.21	-0.03	-0.33
% of temporary employees	0.10	-0.09	-0.92	0.06	-0.07	-0.72	0.09	-0.04	-0.42	0.21	0.01	0.10
HCI-CPI	0.07	-0.04	-0.55	0.06	-0.07	-0.79	0.18	-0.12	-1.37	0.41	-0.14	-1.49
Freedom to trade	0.16	0.15	1.35	0.06	0.06	0.57	0.20	-0.13	-1.35	0.26	-0.09	-0.73
Labour force with secondary ed.	**0.31**	**0.26**	**1.84**	0.05	0.07	0.58	0.09	0.05	0.41	0.22	0.03	0.28
Government consumption (% of GDP)	0.09	0.08	0.74	0.05	0.07	0.66	0.09	0.02	0.15	0.22	0.04	0.35
Change in GVC position	0.09	0.08	0.98	0.05	0.06	0.70	**0.60**	**0.23**	**2.52**	**0.67**	**0.23**	**2.28**
Age dependency ratio	0.08	-0.03	-0.17	0.05	-0.06	-0.49	0.09	0.04	0.35	0.22	0.05	0.44
Index of human capital	0.08	0.02	0.11	0.05	0.04	0.31	0.09	0.04	0.37	0.22	0.04	0.38
RCA in medium-high tech ind.	0.09	-0.07	-0.67	0.05	-0.04	-0.51	0.08	-0.01	-0.10	0.21	0.00	-0.01
Potential crowding-out from China	0.12	-0.14	-1.01	0.05	-0.04	-0.38	0.09	0.00	-0.03	0.24	0.04	0.34
Energy imports (% of energy use)	0.08	-0.02	-0.18	0.05	0.03	0.28	0.09	0.03	0.34	0.21	0.01	0.05
Equity (% of total liabilities)	0.09	-0.01	-0.08	0.05	-0.03	-0.30	0.09	-0.03	-0.33	0.21	0.01	0.07
Loans growth	0.07	-0.05	-0.47	0.05	-0.03	-0.35	0.12	0.09	0.87	0.24	0.05	0.53
Rents from natural resources	0.07	0.04	0.38	0.05	0.03	0.34	0.12	0.08	0.94	0.26	0.08	0.73
Population growth	0.08	-0.07	-0.76	0.05	-0.04	-0.47	**0.25**	**-0.13**	**-1.70**	0.37	-0.11	-1.34
Rule of law	0.10	-0.11	-0.54	0.04	0.00	-0.01	0.08	0.04	0.39	0.21	0.03	0.29
Public debt (% of GDP)	0.09	-0.01	-0.05	0.04	0.00	0.03	0.11	-0.08	-0.74	0.25	-0.08	-0.69
% of part-time employment	0.09	-0.07	-0.65	0.04	0.01	0.08	0.08	-0.01	-0.15	0.20	-0.01	-0.11
Government effectiveness	0.10	0.00	0.01	0.04	0.03	0.34	0.08	0.02	0.32	0.21	0.03	0.28
Control of corruption	0.10	-0.09	-0.55	0.04	-0.02	-0.18	0.09	0.05	0.58	0.26	0.07	0.78
Regulatory quality	0.13	0.16	0.98	0.04	0.01	0.15	0.08	0.00	0.04	0.21	0.01	0.14
Debt (% of total liabilities)	0.07	0.01	0.12	0.04	0.00	0.05	0.08	0.03	0.37	0.21	0.03	0.39
Time fixed effects												
2003							0.09	-0.03	-0.29			
2004							**0.32**	**-0.15**	**-1.75**			
2005							0.10	-0.03	-0.34			
2006							**0.96**	**0.36**	**3.39**			
2007							**0.46**	**0.19**	**2.05**			
2008							0.15	0.04	0.22			
2009							0.32	-0.24	-1.64			
2010							**0.94**	**0.32**	**3.39**			
2011							0.14	-0.09	-0.41			

Note: The Table shows BMA posterior results based on a beta-binomial model prior and an EBL g-prior. *PIP* refers to posterior inclusion probability; *Mean* and *St.dev* refer to the posterior mean and standard deviation of the coefficient estimates respectively. Country fixed effects are based on within-group data transformation.

Table 5: Summary statistics for old EU Member States

Specification	Pooled OLS	Country Fixed effects (WG)	Time and WG country FE	Time and country fixed effects WG
Mean no. regressors	9.69	9.67	8.93	6.89
No. models visited	6448253	5438354	3048699	7168751
% visited	0.00015	0.00012	0.00000	0.00016
% 100 Topmodels	6.00	11.00	21.00	19.00
% 10 Topmodels	0.92	6.20	11.00	4.60
Corr PMP	0.80	0.94	1.00	0.95
Shrinkage-Stats	Av=0.733	Av=0.85	Av=0.9332	Av=0.3356

Note: "%-visited" refers to the percentage of all models evaluated by the MCMC sampler. "% 100 Topmodels" refers to the sum of posterior model probabilities (PMPs) of the top 100 models according to their PIP (analogous definition applies for "% 10 Topmodels"). "Corr PMP" denotes the correlation between the sampling PMPs and analytical PMPs for the top 100 models and "Shrinkage-Stats" defines the average posterior shrinkage statistic.

Table 6: Summary statistics for new EU Member States

Specification	Pooled OLS	Country Fixed effects (WG)	Time and WG country FE	Time and country fixed effects WG
Mean no. regressors	6.71	4.60	10.63	11.12
No. models visited	3826390.00	3099803.00	3739431.00	7547131.00
% visited	0.00009	0.00007	0.00000	0.00017
% 100 Topmodels	16.00	38.00	8.30	8.40
% 10 Topmodels	7.80	22.00	3.90	2.10
Corr PMP	1.00	1.00	1.00	0.97
Shrinkage-Stats	Av=0.923	Av=0.9287	Av=0.9224	Av=0.51

Note: "%-visited" refers to the percentage of all models evaluated by the MCMC sampler. "% 100 Topmodels" refers to the sum of posterior model probabilities (PMPs) of the top 100 models according to their PIP (analogous definition applies for "% 10 Topmodels"). "Corr PMP" denotes the correlation between the sampling PMPs and analytical PMPs for the top 100 models and "Shrinkage-Stats" defines the average posterior shrinkage statistic.

Table 7: Robustness of PIPs to different g-priors - old EU Member States

Specification	Pooled OLS			Country Fixed effects (WG)			Country and time FE			Country FE and optional time dummies		
Variable	EBL	BRIC	UIP	EBL	BRIC	UIP	EBL	BRIC	UIP	EBL	BRIC	UIP
Potential crowding-out from China	0.24	0.01	0.03	**0.86**	**0.99**	**0.97**	0.12	0.01	0.02	0.24	0.00	0.01
New overlap with China	0.23	0.00	0.01	0.70	0.03	0.15	0.13	0.00	0.02	0.24	0.04	0.12
Debt (% of total liabilities)	0.21	0.01	0.02	0.51	0.01	0.08	0.16	0.01	0.04	0.21	0.00	0.02
Investment (% of GDP)	0.43	0.02	0.06	0.44	0.01	0.06	0.16	0.01	0.03	0.31	0.00	0.01
Loans growth	0.56	0.02	0.11	0.34	0.02	0.09	0.08	0.01	0.02	0.24	0.00	0.01
Change in GVC position	0.30	0.02	0.08	0.33	0.00	0.02	0.06	0.00	0.01	0.67	0.00	0.00
Regulatory quality	0.18	0.00	0.01	0.31	0.01	0.06	0.18	0.01	0.05	0.21	0.00	0.01
Labour productivity growth	0.35	0.08	0.14	0.31	0.00	0.02	0.09	0.00	0.02	0.35	0.00	0.01
TFP growth	0.33	0.10	0.16	0.25	0.00	0.01	0.13	0.02	0.04	0.24	0.00	0.01
Freedom to trade	0.44	0.03	0.08	0.24	0.01	0.04	**0.97**	**0.96**	**0.99**	0.26	0.04	0.13
Legal system and property rights	0.19	0.00	0.01	0.24	0.00	0.01	0.16	0.00	0.03	0.24	0.00	0.01
Size of government	0.21	0.00	0.01	0.23	0.00	0.01	0.07	0.00	0.01	0.21	0.00	0.00
HCI-CPI	0.15	0.00	0.01	0.23	0.00	0.01	0.07	0.00	0.02	0.41	0.00	0.00
Public debt (% of GDP)	0.21	0.00	0.01	0.22	0.00	0.01	0.09	0.00	0.01	0.25	0.00	0.00
Existent overlap with China	**0.52**	**0.16**	**0.36**	0.21	0.00	0.01	0.08	0.01	0.01	0.53	0.00	0.00
Labour force with tertiary ed.	0.22	0.00	0.02	0.20	0.00	0.01	0.08	0.00	0.02	0.26	0.00	0.00
Energy imports (% of energy use)	0.17	0.00	0.01	0.19	0.00	0.01	0.06	0.00	0.01	0.21	0.00	0.00
Loans from foreign banks growth	0.19	0.00	0.01	0.19	0.00	0.01	0.16	0.01	0.04	0.46	0.00	0.01
GVC position	0.18	0.00	0.01	0.19	0.01	0.02	0.07	0.00	0.01	0.24	0.00	0.00
Control of corruption	0.17	0.00	0.01	0.19	0.01	0.02	0.07	0.01	0.02	0.26	0.01	0.02
Growth surprise	**0.31**	**0.25**	**0.33**	0.18	0.00	0.01	0.08	0.00	0.02	0.21	0.00	0.00
Loans (% of total liabilities)	0.21	0.00	0.02	0.18	0.00	0.01	0.07	0.00	0.01	0.21	0.00	0.00
Labour force with secondary ed.	0.16	0.00	0.01	0.18	0.00	0.01	0.10	0.00	0.02	0.22	0.00	0.01
Age dependency ratio	0.17	0.00	0.02	0.16	0.00	0.01	0.11	0.00	0.02	0.22	0.00	0.01
Equity (% of total liabilities)	0.21	0.00	0.02	0.16	0.00	0.01	0.07	0.00	0.01	0.21	0.00	0.01
Real FDI liabilities growth	0.18	0.00	0.01	0.16	0.00	0.01	0.06	0.00	0.01	0.30	0.00	0.00
Share of construction in investment	0.17	0.00	0.01	0.16	0.00	0.01	0.11	0.00	0.02	0.26	0.00	0.01
RCA in medium-high tech ind.	0.18	0.00	0.01	0.16	0.00	0.01	0.06	0.00	0.01	0.21	0.00	0.01
Government consumption (% of GDP)	0.16	0.00	0.01	0.15	0.00	0.01	0.10	0.00	0.02	0.22	0.01	0.02
Investment growth	0.19	0.03	0.05	0.15	0.00	0.01	0.08	0.00	0.02	0.22	0.00	0.01
Tax burden	0.17	0.00	0.01	0.15	0.00	0.01	0.07	0.00	0.01	0.55	0.00	0.01
Relative export prices adj. for quality	0.31	0.01	0.04	0.15	0.00	0.01	0.06	0.00	0.01	0.22	0.00	0.00
Index of human capital	0.17	0.00	0.01	0.15	0.00	0.01	0.06	0.01	0.01	0.22	0.00	0.01
Population growth	0.25	0.00	0.01	0.15	0.00	0.01	0.07	0.00	0.01	0.37	0.00	0.00
Rents from natural resources	0.16	0.00	0.01	0.14	0.00	0.01	0.09	0.00	0.02	0.26	0.00	0.01
% of part-time employment	0.17	0.00	0.01	0.14	0.00	0.01	0.07	0.00	0.01	0.20	0.00	0.00
Government effectiveness	0.18	0.00	0.01	0.13	0.00	0.01	0.07	0.00	0.01	0.21	0.00	0.00
Labour force participation rate	0.17	0.00	0.01	0.13	0.00	0.01	0.06	0.00	0.01	0.30	0.00	0.00
Rule of law	0.16	0.00	0.01	0.13	0.00	0.01	0.06	0.00	0.01	0.21	0.00	0.01
Patent applications	0.17	0.00	0.01	0.13	0.00	0.01	0.06	0.00	0.01	0.21	0.00	0.00
% of temporary employees	0.18	0.00	0.01	0.13	0.00	0.01	0.06	0.00	0.01	0.21	0.00	0.00
RCA in high-tech ind.	0.19	0.00	0.01	0.12	0.00	0.01	0.08	0.00	0.02	0.27	0.00	0.00
Time fixed effects												
2003							**0.87**	**0.36**	**0.77**			
2004							**1.00**	**0.99**	**1.00**			
2005							0.11	0.00	0.01			
2006							0.07	0.00	0.01			
2007							0.09	0.00	0.02			
2008							**0.88**	**0.49**	**0.84**			
2009							**0.86**	**0.97**	**0.96**			
2010							0.23	0.01	0.05			
2011							0.15	0.03	0.06			

Note: The Table shows posterior inclusion probabilities for different g-priors. EBL refers empirical local bayes approach; UIP denotes unit information prior and BRIC refers to the prior setting proposed by Fernandez et al. (2001a).

Table 8: Robustness of PIPs to different g-priors - new EU Member States

Specification	Pooled OLS			Country Fixed effects (WG)			Country and time FE			Country FE and optional time dummies		
Variable	EBL	BRIC	UIP	EBL	BRIC	UIP	EBL	BRIC	UIP	EBL	BRIC	UIP
Labour productivity growth	**0.80**	**0.81**	**0.81**	**0.70**	**0.53**	**0.67**	**0.39**	**0.16**	**0.28**	0.35	0.01	0.05
Existent overlap with China	**0.37**	**0.03**	**0.18**	**0.68**	**0.85**	**0.80**	**0.96**	**0.94**	**0.97**	0.53	0.01	0.06
Real FDI liabilities growth	**0.52**	**0.32**	**0.49**	0.31	0.06	0.14	0.18	0.02	0.06	0.30	0.00	0.01
TFP growth	**0.27**	**0.19**	**0.20**	**0.28**	**0.17**	**0.22**	0.22	0.05	0.09	0.24	0.00	0.01
RCA in high-tech ind.	**0.74**	**0.49**	**0.69**	0.28	0.06	0.13	0.24	0.02	0.09	0.27	0.00	0.01
New overlap with China	0.13	0.01	0.04	0.12	0.03	0.05	0.14	0.01	0.03	0.24	0.00	0.01
Labour force participation rate	0.17	0.01	0.04	0.12	0.01	0.03	0.16	0.00	0.02	0.30	0.00	0.01
Relative export prices adj. for quality	0.18	0.01	0.05	0.12	0.01	0.03	0.09	0.00	0.01	0.22	0.00	0.01
Share of construction in investment	0.07	0.01	0.02	0.11	0.00	0.02	0.10	0.00	0.01	0.26	0.00	0.01
Loans from foreign banks growth	0.12	0.00	0.02	0.10	0.00	0.01	0.36	0.00	0.05	0.46	0.01	0.05
Tax burden	0.08	0.00	0.02	0.09	0.00	0.02	0.53	0.01	0.12	0.55	0.01	0.05
Labour force with tertiary ed.	0.09	0.01	0.02	0.08	0.02	0.03	0.12	0.00	0.02	0.26	0.00	0.01
Size of government	0.10	0.00	0.02	0.08	0.00	0.02	0.08	0.00	0.01	0.21	0.00	0.01
Patent applications	0.20	0.02	0.08	0.07	0.00	0.02	0.08	0.00	0.01	0.21	0.00	0.00
GVC position	0.07	0.00	0.02	0.07	0.00	0.01	0.10	0.00	0.02	0.24	0.00	0.01
Growth surprise	0.09	0.00	0.02	0.07	0.01	0.02	0.11	0.01	0.03	0.21	0.00	0.00
Legal system and property rights	0.09	0.00	0.02	0.07	0.00	0.02	0.08	0.00	0.01	0.24	0.00	0.00
Investment (% of GDP)	0.08	0.00	0.01	0.06	0.00	0.01	0.13	0.00	0.02	0.31	0.00	0.01
Investment growth	0.07	0.00	0.01	0.06	0.01	0.01	0.14	0.01	0.05	0.22	0.00	0.01
Loans (% of total liabilities)	0.21	0.05	0.13	0.06	0.01	0.01	0.09	0.00	0.01	0.21	0.00	0.00
% of temporary employees	0.10	0.00	0.02	0.06	0.00	0.01	0.09	0.00	0.01	0.21	0.00	0.01
HCI-CPI	0.07	0.00	0.01	0.06	0.00	0.01	0.18	0.00	0.02	0.41	0.00	0.02
Freedom to trade	0.16	0.01	0.05	0.06	0.00	0.01	0.20	0.00	0.04	0.26	0.00	0.01
Labour force with secondary ed.	0.31	0.04	0.17	0.05	0.00	0.01	0.09	0.00	0.01	0.22	0.00	0.00
Government consumption (% of GDP)	0.09	0.01	0.03	0.05	0.00	0.01	0.09	0.00	0.01	0.22	0.00	0.01
Change in GVC position	0.09	0.00	0.02	0.05	0.00	0.01	0.60	0.01	0.13	0.67	0.02	0.08
Age dependency ratio	0.08	0.00	0.02	0.05	0.00	0.01	0.09	0.00	0.01	0.22	0.00	0.01
Index of human capital	0.08	0.00	0.02	0.05	0.00	0.01	0.09	0.00	0.01	0.22	0.00	0.01
RCA in medium-high tech ind.	0.09	0.00	0.02	0.05	0.00	0.01	0.08	0.00	0.01	0.21	0.00	0.00
Potential crowding-out from China	0.12	0.01	0.04	0.05	0.00	0.01	0.09	0.00	0.02	0.24	0.00	0.01
Energy imports (% of energy use)	0.08	0.01	0.02	0.05	0.00	0.01	0.09	0.00	0.01	0.21	0.00	0.01
Equity (% of total liabilities)	0.09	0.01	0.03	0.05	0.00	0.01	0.09	0.00	0.01	0.21	0.00	0.01
Loans growth	0.07	0.00	0.02	0.05	0.00	0.01	0.12	0.00	0.02	0.24	0.00	0.01
Rents from natural resources	0.07	0.00	0.02	0.05	0.00	0.01	0.12	0.00	0.02	0.26	0.00	0.00
Population growth	0.08	0.00	0.02	0.05	0.00	0.01	0.25	0.01	0.07	0.37	0.02	0.09
Rule of law	0.10	0.01	0.03	0.04	0.00	0.01	0.08	0.00	0.01	0.21	0.00	0.01
Public debt (% of GDP)	0.09	0.00	0.02	0.04	0.00	0.01	0.11	0.00	0.01	0.25	0.00	0.00
% of part-time employment	0.09	0.00	0.02	0.04	0.00	0.01	0.08	0.00	0.01	0.20	0.00	0.01
Government effectiveness	0.10	0.00	0.03	0.04	0.00	0.01	0.08	0.00	0.01	0.21	0.00	0.01
Control of corruption	0.10	0.01	0.03	0.04	0.00	0.01	0.09	0.00	0.01	0.26	0.00	0.01
Regulatory quality	0.13	0.01	0.04	0.04	0.00	0.01	0.08	0.00	0.01	0.21	0.00	0.00
Debt (% of total liabilities)	0.07	0.00	0.01	0.04	0.00	0.01	0.08	0.00	0.01	0.21	0.00	0.00
Time fixed effects												
2003							0.09	0.00	0.01			
2004							0.32	0.02	0.12			
2005							0.10	0.00	0.01			
2006							**0.96**	**0.78**	**0.93**			
2007							0.46	0.06	0.25			
2008							0.15	0.03	0.04			
2009							0.32	0.05	0.09			
2010							**0.94**	**0.70**	**0.92**			
2011							0.14	0.04	0.04			

Note: The Table shows posterior inclusion probabilities for different g-priors. EBL refers empirical local bayes approach; UIP denotes unit information prior and BRIC refers to the prior setting proposed by Fernandez et al. (2001a).

Table 9: Estimation results for old Member States when including HCI-ULC

Specification	Pooled OLS			Country Fixed effects (WG)			Country and time FE			Country FE and optional time dummies		
Variable	PIP	Mean	Mean/St.dev.	PIP	Mean	Mean/St.dev.	PIP	Mean	Mean/St.dev.	PIP	Mean	Mean/St.dev.
Potential crowding-out from China	0.24	-0.11	-0.84	**0.85**	**-0.41**	**-2.69**	0.12	-0.17	-0.72	0.15	0.00	-0.01
New overlap with China	0.23	-0.11	-0.81	**0.68**	**-0.31**	**-2.50**	0.13	0.24	0.96	0.33	0.13	1.61
Debt (% of total liabilities)	0.21	-0.08	-0.83	**0.50**	**-0.17**	**-2.06**	0.16	-0.11	-1.52	0.19	-0.06	-0.85
Investment (% of GDP)	0.43	0.23	1.61	0.44	0.28	1.59	0.16	0.18	1.24	0.21	0.11	0.88
Loans growth	**0.56**	**0.17**	**2.15**	**0.35**	**0.15**	**1.70**	0.08	0.07	0.83	0.17	0.04	0.71
Change in GVC position	0.30	-0.12	-1.32	0.33	-0.16	-1.64	0.07	-0.01	-0.13	0.14	0.01	0.12
Regulatory quality	0.18	0.10	0.53	0.31	0.14	1.57	0.18	0.12	1.61	0.18	0.05	0.74
Labour productivity growth	0.36	0.16	1.44	0.30	0.17	1.49	0.09	0.08	0.76	0.15	0.02	0.26
Freedom to trade	**0.43**	**0.22**	**1.75**	0.24	0.18	1.27	**0.97**	**0.50**	**4.21**	0.30	0.12	1.44
TFP growth	0.33	0.16	1.06	0.24	0.20	0.96	0.14	0.20	1.06	0.16	0.05	0.48
Legal system and property rights	0.19	0.12	0.68	0.23	0.12	1.36	0.16	0.12	1.51	0.19	0.05	0.87
Size of government	0.21	-0.10	-0.91	0.23	-0.11	-1.30	0.07	-0.03	-0.41	0.14	0.00	-0.04
Public debt (% of GDP)	0.21	0.15	0.76	0.21	0.19	0.85	0.09	0.11	0.62	0.17	0.07	0.61
Existent overlap with China	**0.52**	**-0.20**	**-1.86**	0.20	-0.20	-0.84	0.08	-0.11	-0.53	0.15	0.00	-0.03
Labour force with tertiary ed.	0.22	-0.09	-0.87	0.20	-0.15	-0.96	0.08	-0.09	-0.77	0.14	-0.01	-0.19
GVC position	0.18	-0.06	-0.49	0.19	-0.11	-0.85	0.07	-0.04	-0.39	0.15	-0.02	-0.26
Loans from foreign banks growth	0.19	-0.07	-0.71	0.19	-0.11	-1.07	0.16	-0.14	-1.43	0.18	-0.05	-0.78
Control of corruption	0.17	0.05	0.20	0.19	0.10	1.01	0.07	0.05	0.62	0.15	0.03	0.41
Energy imports (% of energy use)	0.17	0.06	0.44	0.18	0.08	1.07	0.06	0.00	0.03	0.14	-0.01	-0.10
Growth surprise	0.31	0.12	0.71	0.18	0.00	0.01	0.09	-0.07	-0.28	0.15	-0.02	-0.24
HCI-ULCT	0.16	0.01	0.08	0.18	-0.09	-0.87	0.06	0.01	0.06	0.14	0.00	0.09
Loans (% of total liabilities)	0.21	0.09	0.57	0.17	0.14	0.68	0.07	0.04	0.28	0.15	0.01	0.14
Labour force with secondary ed.	0.16	0.02	0.13	0.17	0.08	0.92	0.10	0.08	1.08	0.16	0.03	0.47
Age dependency ratio	0.17	0.01	0.08	0.16	-0.09	-0.78	0.11	-0.10	-1.14	0.17	-0.05	-0.63
Government consumption (% of GDP)	0.16	-0.02	-0.17	0.16	0.07	0.47	0.10	0.11	0.99	0.19	0.06	0.87
Real FDI liabilities growth	0.18	-0.06	-0.64	0.16	-0.08	-0.77	0.06	-0.01	-0.13	0.14	0.01	0.14
Equity (% of total liabilities)	0.21	-0.07	-0.54	0.16	0.09	0.37	0.07	0.06	0.42	0.15	0.04	0.40
RCA in medium-high tech ind.	0.18	-0.06	-0.38	0.16	0.06	0.77	0.06	0.00	0.04	0.15	0.02	0.35
Investment growth	0.19	0.05	0.34	0.15	-0.05	-0.27	0.09	0.08	0.67	0.16	0.04	0.46
Share of construction in investment	0.17	-0.05	-0.38	0.15	0.04	0.30	0.12	0.09	1.09	0.18	0.06	0.72
Tax burden	0.16	-0.04	-0.23	0.15	0.05	0.54	0.07	0.04	0.52	0.15	0.03	0.44
Relative export prices adj. for quality	0.31	-0.11	-1.41	0.15	-0.06	-0.72	0.06	-0.01	-0.18	0.14	0.00	-0.03
Index of human capital	0.17	0.05	0.42	0.15	-0.04	-0.21	0.07	-0.02	-0.13	0.15	0.00	0.00
Population growth	0.25	-0.13	-1.07	0.14	-0.06	-0.58	0.07	-0.03	-0.31	0.15	0.01	0.09
Rents from natural resources	0.16	0.00	0.00	0.14	0.06	0.69	0.09	-0.07	-1.02	0.16	-0.04	-0.60
% of part-time employment	0.17	-0.08	-0.39	0.13	-0.04	-0.33	0.07	0.03	0.33	0.15	0.01	0.13
Government effectiveness	0.18	-0.12	-0.60	0.13	-0.02	-0.21	0.07	0.04	0.48	0.15	0.02	0.37
Labour force participation rate	0.17	0.10	0.47	0.13	0.00	-0.04	0.06	0.01	0.09	0.15	-0.01	-0.13
Rule of law	0.16	0.03	0.11	0.13	-0.02	-0.20	0.06	0.00	-0.01	0.15	-0.01	-0.17
Patent applications	0.16	-0.03	-0.17	0.13	0.00	0.01	0.06	-0.02	-0.31	0.14	0.01	0.17
% of temporary employees	0.18	0.05	0.49	0.12	0.01	0.16	0.07	-0.03	-0.40	0.15	-0.01	-0.18
RCA in high-tech ind.	0.19	-0.06	-0.34	0.12	0.03	0.33	0.08	0.06	0.85	0.15	0.02	0.41
Time fixed effects												
2003							**0.88**	**-0.24**	**-3.23**			
2004							**1.00**	**-0.41**	**-4.34**			
2005							0.11	-0.15	-0.88			
2006							0.07	0.02	0.15			
2007							0.10	-0.10	-0.81			
2008							**0.88**	**0.26**	**2.93**			
2009							**0.85**	**-0.35**	**-3.50**			
2010							0.23	0.16	1.50			
2011							0.16	-0.08	-0.58			

Note: The Table shows posterior inclusion probabilities for different g-priors. EBL refers empirical local bayes approach; UIP denotes unit information prior and BRIC refers to the prior setting proposed by Fernandez et al. (2001a).

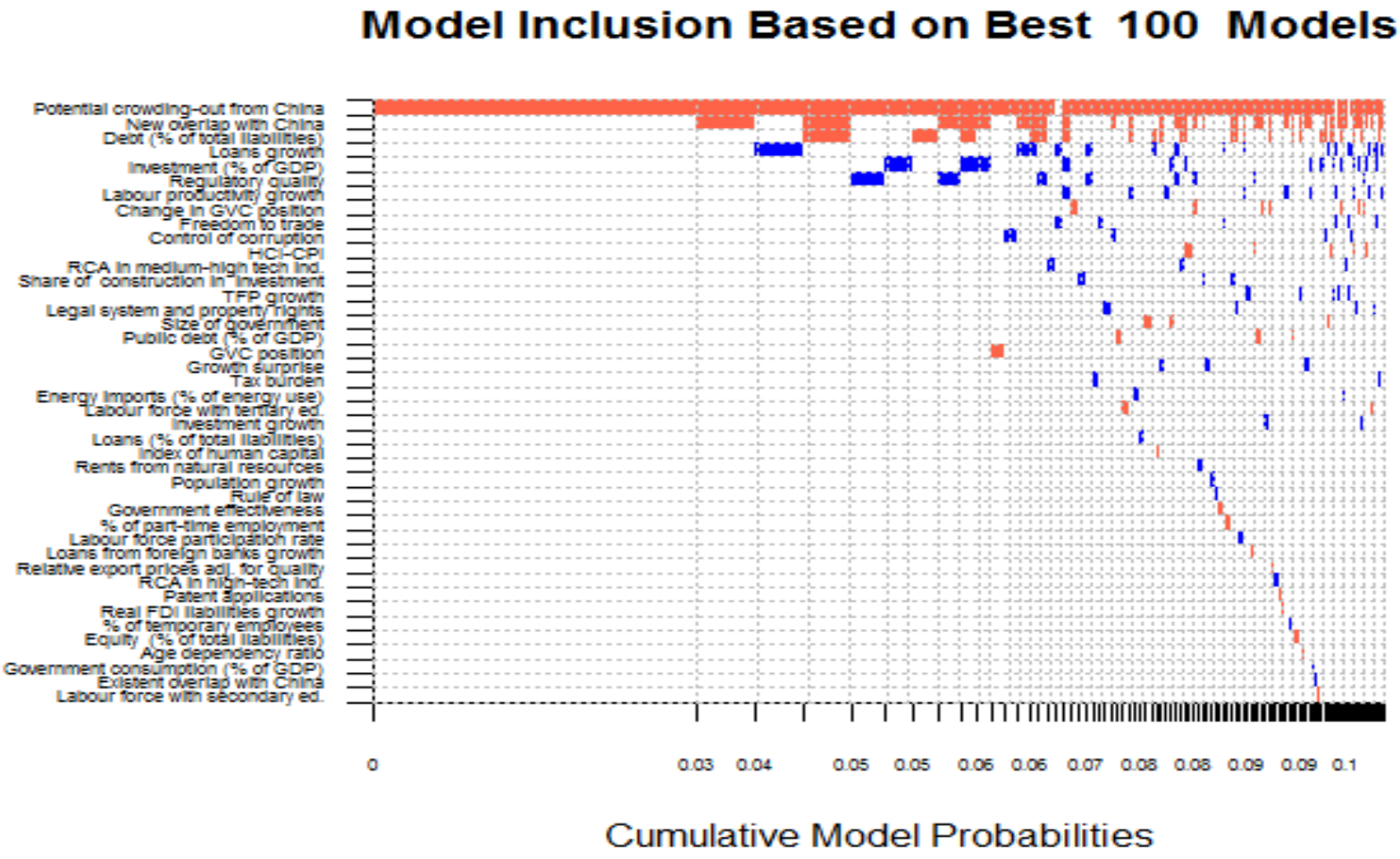
Table 10: Estimation results for new Member States when including HCI-ULC

Specification	Pooled OLS			Country Fixed effects (WG)			Country and time FE			Country FE and optional time dummies		
Variable	PIP	Mean	Mean/St.dev.	PIP	Mean	Mean/St.dev.	PIP	Mean	Mean/St.dev.	PIP	Mean	Mean/St.dev.
Labour productivity growth	**0.80**	**0.34**	**3.25**	**0.70**	**0.31**	**3.19**	**0.40**	**0.19**	**2.09**	0.36	0.12	1.33
Existent overlap with China	**0.37**	**-0.25**	**-2.06**	**0.68**	**-0.35**	**-2.95**	**0.96**	**-0.56**	**-3.88**	**0.51**	**-0.21**	**-1.72**
Real FDI liabilities growth	**0.52**	**0.21**	**2.41**	**0.31**	**0.22**	**2.19**	0.18	0.15	1.38	0.29	0.08	1.06
TFP growth	**0.27**	**0.29**	**1.77**	**0.29**	**0.30**	**2.11**	0.23	0.20	1.34	0.24	0.05	0.37
RCA in high-tech ind.	**0.75**	**-0.31**	**-2.57**	**0.28**	**-0.22**	**-2.14**	0.24	-0.15	-1.60	0.28	-0.09	-0.88
Labour force participation rate	0.17	-0.16	-1.43	0.12	-0.14	-1.53	0.16	-0.10	-1.32	0.30	-0.10	-1.06
New overlap with China	0.13	0.16	0.98	0.12	0.19	1.30	0.13	0.01	0.04	0.23	-0.02	-0.13
Relative export prices adj. for quality	0.18	0.13	1.59	0.12	0.13	1.55	0.09	0.05	0.58	0.22	0.04	0.47
Share of construction in investment	0.07	0.04	0.27	0.11	0.17	1.37	0.09	0.06	0.51	0.25	0.08	0.81
Loans from foreign banks growth	0.12	-0.12	-1.14	0.10	-0.15	-1.28	**0.34**	**-0.22**	**-1.97**	0.43	-0.14	-1.58
Tax burden	0.08	-0.01	-0.06	0.09	0.11	1.28	**0.50**	**0.19**	**2.36**	**0.48**	**0.17**	**1.72**
Labour force with tertiary ed.	0.09	-0.04	-0.24	0.09	-0.12	-0.62	0.11	0.15	0.70	0.24	0.07	0.63
Size of government	0.10	-0.10	-0.84	0.08	-0.11	-1.12	0.08	0.00	0.03	0.21	0.03	0.35
Patent applications	0.20	-0.16	-1.54	0.07	-0.10	-0.95	0.08	0.00	0.00	0.20	0.01	0.13
GVC position	0.07	-0.01	-0.06	0.07	0.09	1.02	0.09	0.01	0.14	0.22	-0.01	-0.12
Growth surprise	0.08	-0.05	-0.24	0.07	0.04	0.20	0.11	0.06	0.34	0.21	0.00	-0.03
Legal system and property rights	0.09	0.10	0.67	0.07	0.09	0.94	0.08	-0.02	-0.26	0.23	-0.05	-0.61
Investment growth	0.07	0.03	0.21	0.06	0.08	0.60	0.14	0.12	0.98	0.22	0.05	0.42
Loans (% of total liabilities)	0.20	-0.19	-1.39	0.06	-0.10	-0.69	0.08	-0.05	-0.39	0.21	-0.03	-0.32
Investment (% of GDP)	0.08	-0.07	-0.60	0.06	-0.08	-0.73	0.11	-0.10	-0.82	0.27	-0.10	-0.88
% of temporary employees	0.10	-0.09	-0.92	0.06	-0.07	-0.72	0.09	-0.04	-0.43	0.21	0.01	0.13
Freedom to trade	0.16	0.15	1.37	0.06	0.06	0.59	0.18	-0.12	-1.27	0.25	-0.08	-0.63
Labour force with secondary ed.	**0.31**	**0.26**	**1.85**	0.06	0.07	0.59	0.09	0.05	0.40	0.21	0.04	0.29
Change in GVC position	0.09	0.08	0.99	0.06	0.06	0.71	**0.58**	**0.22**	**2.51**	**0.63**	**0.22**	**2.24**
HCI-ULCT	0.08	-0.06	-0.78	0.06	-0.07	-0.76	0.14	-0.10	-1.14	0.34	-0.11	-1.25
Government consumption (% of GDP)	0.09	0.08	0.74	0.05	0.07	0.67	0.09	0.02	0.23	0.23	0.06	0.54
Age dependency ratio	0.08	-0.02	-0.17	0.05	-0.06	-0.48	0.08	0.04	0.35	0.22	0.05	0.45
Index of human capital	0.08	0.02	0.11	0.05	0.03	0.30	0.08	0.04	0.35	0.21	0.03	0.30
RCA in medium-high tech ind.	0.09	-0.07	-0.67	0.05	-0.04	-0.52	0.08	-0.01	-0.09	0.20	0.00	0.02
Potential crowding-out from China	0.12	-0.14	-1.00	0.05	-0.04	-0.37	0.09	-0.01	-0.07	0.23	0.03	0.27
Energy imports (% of energy use)	0.08	-0.02	-0.18	0.05	0.03	0.28	0.08	0.03	0.33	0.20	0.00	0.01
Equity (% of total liabilities)	0.09	-0.02	-0.09	0.05	-0.03	-0.31	0.08	-0.04	-0.40	0.20	0.00	-0.04
Loans growth	0.07	-0.05	-0.47	0.05	-0.03	-0.34	0.13	0.10	0.97	0.25	0.07	0.71
Rents from natural resources	0.07	0.05	0.39	0.05	0.03	0.34	0.11	0.08	0.93	0.25	0.08	0.72
Population growth	0.08	-0.07	-0.77	0.05	-0.04	-0.46	**0.24**	**-0.13**	**-1.70**	0.36	-0.11	-1.32
Rule of law	0.10	-0.11	-0.53	0.04	0.00	-0.01	0.08	0.04	0.38	0.21	0.03	0.27
Public debt (% of GDP)	0.09	-0.01	-0.05	0.04	0.00	0.02	0.10	-0.08	-0.74	0.25	-0.08	-0.72
Government effectiveness	0.10	0.00	0.01	0.04	0.03	0.34	0.08	0.02	0.30	0.21	0.02	0.25
Control of corruption	0.10	-0.09	-0.55	0.04	-0.01	-0.17	0.09	0.05	0.59	0.25	0.08	0.81
Debt (% of total liabilities)	0.07	0.01	0.11	0.04	0.00	0.04	0.08	0.02	0.32	0.20	0.02	0.29
Regulatory quality	0.13	0.16	0.99	0.04	0.01	0.15	0.08	0.00	0.02	0.21	0.00	0.05
% of part-time employment	0.09	-0.07	-0.66	0.04	0.01	0.07	0.07	-0.01	-0.13	0.20	-0.01	-0.09
Time fixed effects												
2003							0.08	-0.02	-0.26			
2004							**0.32**	**-0.16**	**-1.78**			
2005							0.09	-0.03	-0.36			
2006							**0.96**	**0.35**	**3.42**			
2007							**0.46**	**0.19**	**2.07**			
2008							0.14	0.04	0.22			
2009							0.28	-0.22	-1.57			
2010							**0.95**	**0.32**	**3.45**			
2011							0.13	-0.08	-0.37			

Note: The Table shows posterior inclusion probabilities for different g-priors. EBL refers empirical local bayes approach; UIP denotes unit information prior and BRIC refers to the prior setting proposed by Fernandez et al. (2001a).

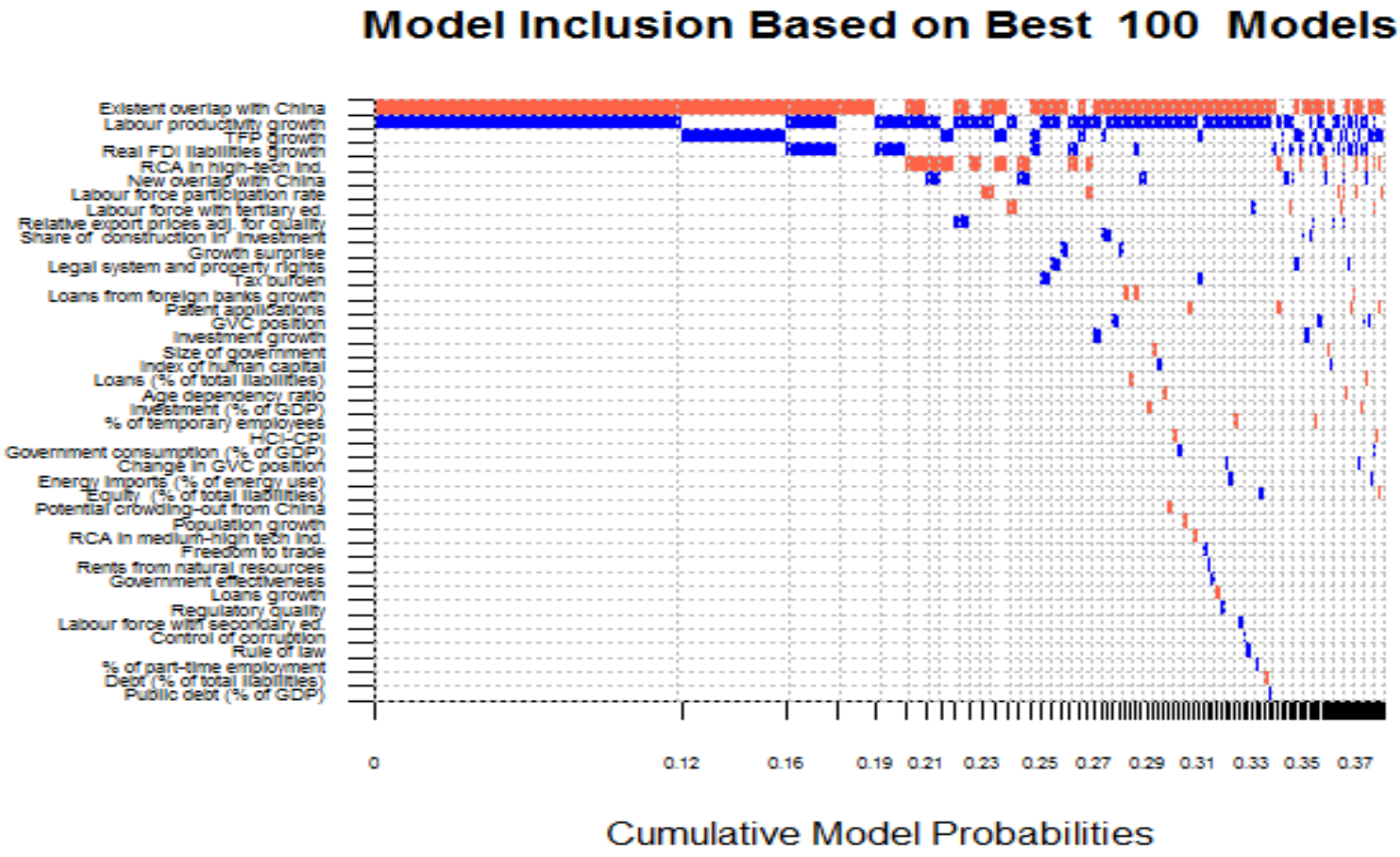
Figures

Figure 1: First 100 models ordered by their PMP - old EU Member States



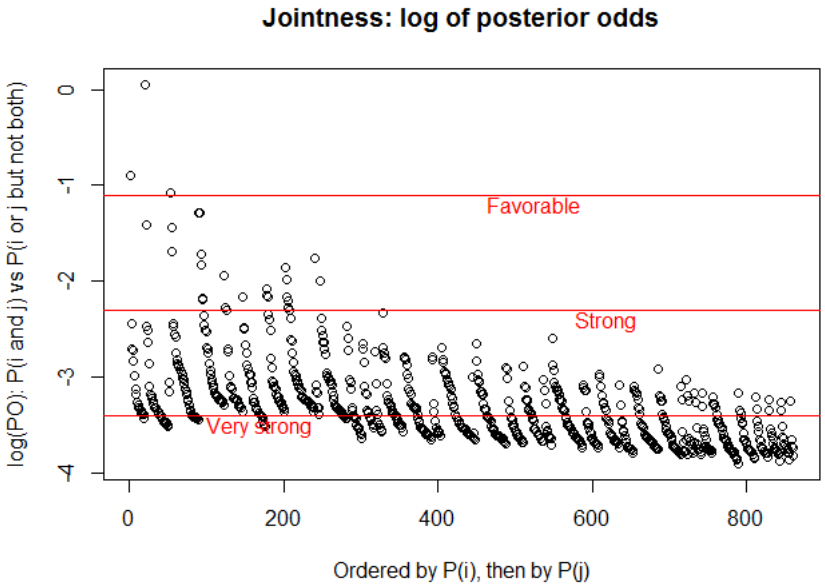
Note: Each column in the Figure refers to a particular model. Red or blue colors indicate that this variable has, respectively, a negative or positive posterior mean coefficient in a given model. White indicates that this variable is not included in a model.

Figure 2: First 100 models ordered by their PMP - old EU Member States



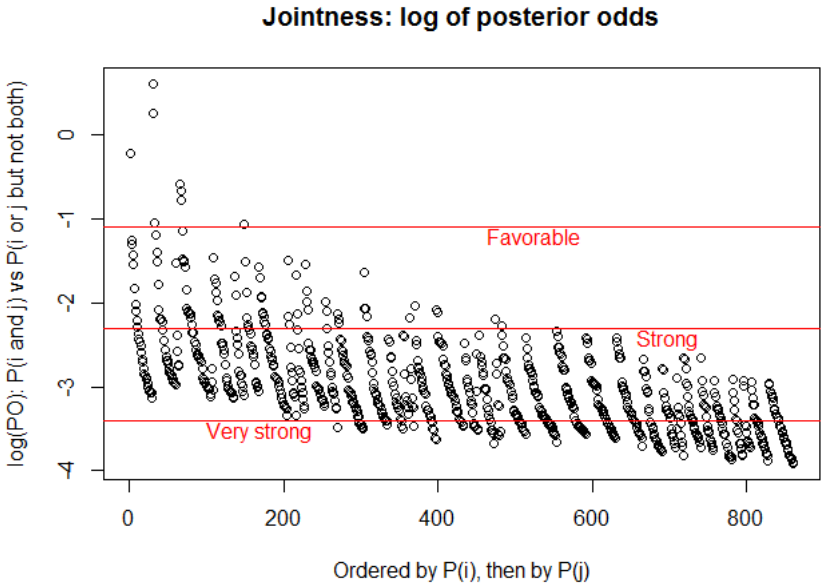
Note: Each column in the Figure refers to a particular model. Red or blue colors indicate that this variable has, respectively, a negative or positive posterior mean coefficient in a given model. White indicates that this variable is not included in a model.

Figure 3: Jointness analysis - old EU Member States



Note: The Figure shows the logarithm of the posterior odds ratio for all variable pairs. The variable pairs are ordered by their PIPs. The horizontal red lines indicate cut-off values for different degrees of bivariate disjointness.

Figure 4: Jointness analysis - new EU Member States



Note: The Figure shows the logarithm of the posterior odds ratio for all variable pairs. The variable pairs are ordered by their PIPs. The horizontal red lines indicate cut-off values for different degrees of bivariate disjointness.

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