Convergence, divergence, trade and competitiveness in the European Union, 1990-2019

Gadomski, Michal Szymon

UNIVERSITÉ DE GENÈVE

GENEVA SCHOOL OF SOCIAL SCIENCES

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Michał Gadomski

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Supervisor :

Marc Morgan

Jury :

Prof. Michalis Nikiforos

Geneva School of Social Sciences

Département d'Histoire, Économie et Société (DEHES)

Université de Genève

Abstract

The diverging economic trajectories of European Union countries, laid bare and amplified by the Eurozone Crisis are the subject of debates within Comparative Political Economy and Post-Keynesian Economics, often centring on the role of price and non-price competitiveness. This paper aims to contribute to these debates by examining the dynamics of fourteen Eastern and Western European countries between 1990 and 2019, analysing the convergence of the former towards the latter and divergence within the two groups. In so doing, it draws on Thirlwall's (1979) model of Balance of Payments-Constrained Growth, Post-Keynesian theories of export-led growth and the literature on competitiveness within the EU. It argues that patterns of trade and income growth lend support to the thesis that European Economies were Balance of Payment-constrained and that their export performance therefore conditioned their growth trajectories. It also finds Eastern Europe's convergence to have been driven by price competitiveness, while divergence within the East and the West was at least in part due to non-price competitiveness. On the theoretical and methodological side, it claims existing measures of competitiveness, both price and non-price, are severely flawed because the Real Effective Exchange Rates that are used as price variables fail to appropriately account for price competitiveness.

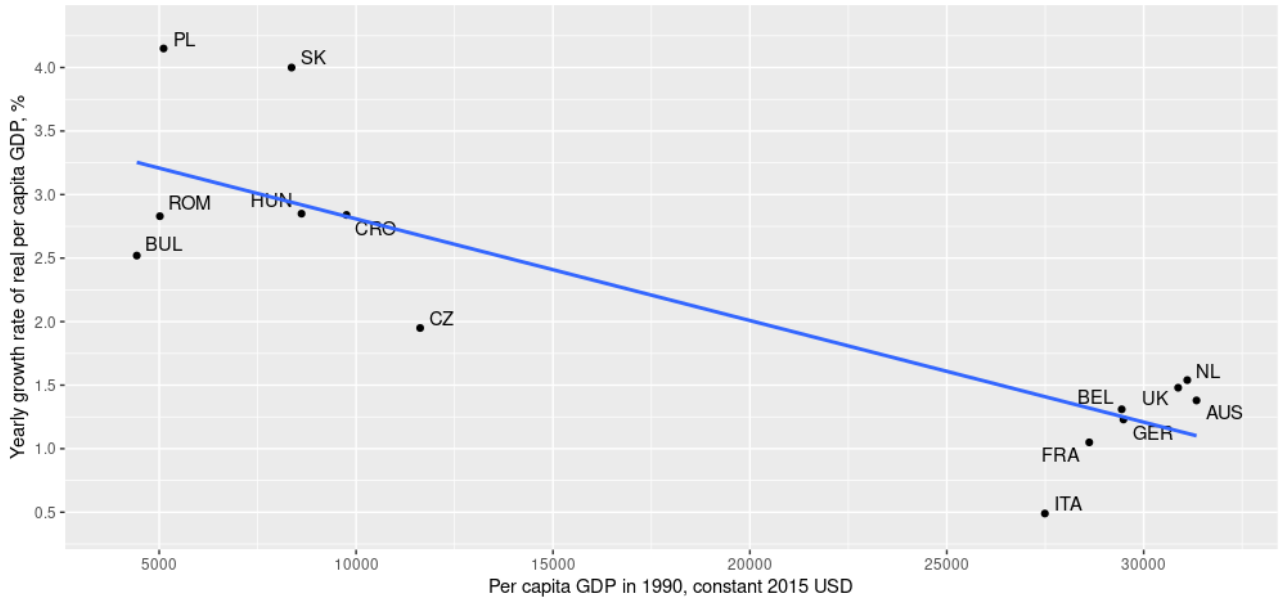
1. Table of Contents

Introduction : ever closer union ?

In the preamble to the European Union's founding treaty, the presidents, queens, kings and grand dukes of Europe declare their goals to be, among other things, "the strengthening and convergence of their economies" and "economic and social progress for their peoples" (Treaty on European Union, 1992, p. 1). Three decades and several crises later, the unifying project of "ever closer union among the peoples of Europe" (Ibid., p.2) comes up against the failure of these promises. Temperatures rise, industrial policy is back in style and dreams of *doux commerce* melt away. Politicians see the Union as a way to protect the interests of European peoples in the context of renewed great power competition. Yet these ambitions are hampered by economic inequality in the EU : in a context where rearmament, the ecological crisis and ageing populations will require increasing public spending, governments have very unequal resources to cope. The Maastricht treaty's fiscal rules, suspended during the pandemic, are being reintroduced and driving a wave of austerity that jeopardises states' capacity to carry out industrial policy and invest in decarbonizing their economies, while the EU's own resources remain far too minimal to address such challenges (Mang and Caddick, 2023).

Economic inequalities and political tensions in the EU are often framed in terms of the confrontation between a core and a periphery, a high-tech, fiscally thrifty, vigorously exporting North against a stagnant, debt-ridden and unemployment-plagued South (e.g. Gräbner, Heimberger, Kapeller and Schütz, 2020). Though this picture is indeed one of divergence, another divide in Europe is in fact narrowing : the post-socialist East is catching up with the West, or at least enjoying much higher income growth rates, as illustrated by Figure 1.

Fig 1. Convergence and divergence within the EU, 1990-2019



Source : author's calculations, World Bank for per capita GDP in 1990, Ameco for real per capita GDP growth. Ameco real GDP data starts in 1990 for Poland, Czechia, Romania, Italy, France, Belgium, the Netherlands, Austria and the UK, 1991 for Bulgaria, Hungary and Germany, 1992 for Slovakia and 1995 for Croatia.

I will focus, in explaining these diverging economic dynamics, on the role of exports. Exports are essential in several strands of theory focusing on economic growth. In post-keynesian macroeconomics, they play an important role in alleviating the balance of payments-constraint and driving productivity growth (Thirlwall, 1979, Blecker and Setterfield, 2019, chapters 8-10). According to structuralist traditions present in dependency theory, the specialisation of a country and its place in the global division of labour determines its prospects for economic development (Kvangraven, 2020). For the Growth Models Perspective, a country's specialisation and competitiveness plays a role in determining feasible growth models, be they domestic demand or export-led (Baccaro and Pontusson, 2016).

There are also empirical reasons to investigate the role of exports : the period under consideration is one of massive trade integration. Between 1995 and 2019, trade rose from 36 to 60% of GDP in Italy and from 46 to 103% in Poland (World Bank Open Data). Similar rises take place in other countries in the region, with exports increasing roughly at twice the rate of income in both Western and Eastern Europe : this makes trade an essential piece of the economic dynamics of the region. Finally, exports and competitiveness play an important role in the literature and in political discourse on these issues : the predicament of the EU's southern periphery has often been framed in terms of lack of competitiveness, which drove the Union's policy prescription for its southern members. Austerity measures were proposed as a cure for countries' balance of payments deficits : this past focus on competitiveness through wage cuts and "internal devaluation" as well as the recent resurgence in interest in industrial policy pose the question of the role of price and non-price competitiveness in the export performance of my countries (Storm and Naastepad, 2016, Juhasz, Lane and Rodrik, 2023).

The aim of the paper is thus to investigate the role of European countries' export performance in their economic dynamics and to evaluate the part played by price and non-price competitiveness in the evolution of their exports. My hypothesis is that both factors mattered : the East's convergence was due in part to the region's low wages, and divergence within the East and West was driven in part by non-price competitiveness factors. In the sections dedicated to literature review and methodology as well as that focusing on the question of competitiveness, I emphasise the difficulty in disentangling price and non-price factors, the latter, pertaining to quality, being difficult to quantify. I also argue that because of these difficulties, many indicators considered to measure non-price competitiveness in fact fail to do so.

The bounds of the period under study are 1990 and 2019. The first date is chosen to correspond to Poland's adoption of the "shock therapy" free market economic reform package spearheaded by finance minister Leszek Balcerowicz (Piątkowski, 2017), but also to coincide with the somewhat arbitrary start of the 1990s, the decade of economic transformation from socialism to capitalism in the East, and of the Maastricht treaty and preparations for Economic and Monetary Union in the West. The 90s also mark the beginning of Eastern Europe's turn to the West and its integration into the EU: though post-socialist countries only join the bloc in 2004, 2007 and 2013, the negotiations and political processes leading to enlargement, and the East's increasing trade integration with the West, start over a decade before. Finally, the decade also constitutes the beginning of the relative decline in wages and productivity of one of the EU's founding members, Italy (Storm, 2019, p.20, Bagnai, 2014, p. 3). The end date is chosen to exclude the period of the Covid-19 pandemic : the purpose of this paper is to analyse long term economic trends, and the turbulent and unprecedented

period of the pandemic shutdowns would merit its own study, separate from the examination of three decades of European integration.

In order to investigate the economic trajectories of my chosen countries, this paper draws on three main sources of methodological and theoretical inspiration : Anthony Thirlwall's model of Balance of Payments-Constrained Growth (BOPCG), a post-keynesian focus on exports driving productivity growth (Blecker and Setterfield, 2016, chapter 8) and the vast literature on competitiveness and divergence in the EU at the intersection of post-keynesian macroeconomics and the Growth Models Perspective. The first part reviews the literature on growth models, export dynamics and competitiveness in the EU. The second outlines the theoretical and methodological framework of the paper. The third examines the trade dynamics of my fourteen countries using Thirlwall's BOPCG model, investigating the relationship between countries' growth and their balance of payments dynamics and seeking to assess whether European countries' growth was constrained by their balance of payments. The fourth then assesses, using different indicators, the respective roles of price and non-price competitiveness in countries' performance as well as the methodological merits and drawbacks of these different measures.

1. Literature review

My research subject and methodology place me at the intersection of several strands of literature that all deal, in different ways and with different foci, with comparing economic dynamics across countries: the Growth Models Perspective (following Baccaro and Pontusson, 2016), the Dependency Research Programme (Kvangraven, 2020), Comparative Political Economy (e.g. Nölke and Vliegenthart, 2009), research drawing on Thirlwall's (1979, 2011) balance-of-payments constrained growth (BOPCG) model and the literature interested in the role of price and non-price competitiveness in economic dynamics in the European Union (e.g. Storm and Naastepad, 2016, Gräbner et. al., 2020a, Keil, 2024a). In this section, I will seek to succinctly survey these literatures, focusing on their treatment of the role exports in growth performance, and point to their weaknesses, blind spots, and the gaps they leave, to show what my approach can contribute to the understanding of my subject. A more conceptual examination of the theoretical assumptions of the Growth Models Perspective, Balance of Payments Constrained Growth model and measures of price and non-price competitiveness will follow in the section expanding on my theoretical framework and methodology.

1.1. The Growth Models Perspective and the Dependency Research Programme

The approaches surveyed in this subsection are strands of Comparative Political Economy (CPE). The GMP builds on the framework proposed by Lucio Baccaro and Jonas Pontusson (Baccaro, Pontusson, 2016, Baccaro, Pontusson and Blyth, 2022). These authors seek to broaden the horizons of CPE, which is in their opinion excessively focused on institutions and the supply side, by emphasising the role of demand-side dynamics, distribution and macroeconomics in analysing different national capitalist systems. The authors classify the dynamics of the economies they study, based on the component of aggregate demand which drives growth, as export-led or domestic-demand led. This classification is expanded in further contributions to this literature : depending on

dynamics of credit, trade and wages, economies can thus be termed export-led mercantilist, weakly export-led, domestic demand-led, or debt-led private demand boom (Hein, 2022). Other authors add categories based on the sectoral specialisation or other features of the economies in question, such as whether their exports are driven by high-end services or manufacturing or whether they rely on Foreign Direct Investment (FDI) (Hassel and Pallier, 2023).

To explain the divergent trajectories of Italy compared to its peers Sweden, Germany and the UK, Baccaro and Pontusson's original 2016 article highlights mechanisms such as non-price competitiveness making wage increases compatible with export success or the impact of wage dynamics on demand for non-traded goods or services and thus the strength of labour in these industries. The authors thus argue that the exports of Sweden and the UK have high non-price competitiveness, allowing these countries to pursue domestic demand-led growth as rises in wages do not threaten their export growth and balance of payments. German and Italian exports, on the other hand, have to compete on price : the two countries therefore cannot afford a rise in wages and thus experience stagnating wages and domestic demand. This, in conjunction with membership of the common currency, which Germany entered with an undervalued exchange rate and Italy with an overvalued one, means the former country is able to pursue export-led growth, making up for its lack of internal demand, while its southern neighbour stagnates.

The GMP tends to classify Eastern European economies as a domestic demand-led up to the Great Financial Crisis, and then a weakly export-led one as their net exports improved after the crisis (Kühnast, 2022, Hein, 2022). The latter category is criticised by Kohler and Stockhammer (2022), who point out that what registers as a positive contribution of net exports to growth may simply reflect a reduction in imports through reduced domestic demand due to austerity and private sector deleveraging. The emphasis on *net* exports, that only sees export performance as important to growth if a country is a next exporter or is increasing its net exports, is problematic in a further way which the BOPCG model will allow me to address. The same weakness is apparent in Kühnast's (2022) treatment of changes in the growth models of Hungary and Poland after the 2008 Global Financial Crisis (GFC). The author argues, on the basis of these countries' inflation rates, rise in labour costs and current account deficits up to the crisis, and improvement in current account balances after it, that they initially followed a domestic-demand led model and later pivoted to a weakly export-led one. I will argue that in addition to the reductive treatment of the role of exports, this account is mistaken in identifying the shift in macroeconomic dynamics as a change of strategy and "macroeconomic regimes".

While the GMP literature is useful in drawing attention to and exploring demand-side macroeconomic dynamics in a comparative perspective, its suffers from a shallow analysis of the role of trade and exports and mistakenly identifies macroeconomic dynamics as results of coherent "regimes", implying an undue degree of coherence in countries' performances and conscious strategizing and agency on the part of states (Amable, 2023). As will become clear in the fourth section, it is also rather limited in its analysis of competitiveness and the drivers of export performance.

Alongside the GMP, and often dovetailing with it, another literature takes a comparative approach to EU economies : that at the intersection of the Dependency Research Programme (DRP) and Comparative Political Economy (Kvangraven, 2020, Nölke and Vliegenthart, 2009). As these

writings are further from my approach in both methodology and emphasis, I spend comparatively little space on summarising them.

Authors in these frameworks emphasise the integration of economies into value chains, the role of multinational corporations (MNCs) and international financial flows in national dynamics. In discussing divergent dynamics in Western Europe, these approaches draw attention to the role of the EMU in impacting competitiveness, relaxing "market discipline" and enabling low real interest rates in southern Eurozone countries, thus favouring the development of bubbles and unsustainable financial dynamics (Becker, Weissenbacher and Jäger, 2021, Bruszt and Vukov 2017). This literature is more developed in the case of Eastern Europe : it analyses the conditions of the transition to a market economy and entry into the European Union in the period of triumphant neoliberalism, points to the importance of Foreign Direct Investment (FDI) for growth and technological upgrading, the weight of foreign industry in Eastern economies and emigration following the fall of the iron curtain and EU accession (Bruszt and Vukov, 2017, Scheiring, 2021, Kuc-Czarnecka et. al., 2023, Becker, Weissenbacher and Jäger, 2021, Kühnast, 2022).

The DRP-CPE literature draws attention to many aspects of European economies' integration into the European and global economy, countries' specialisation, capital flows and institutional factors. These writings, though they address economic performance from a comparative perspective, differ in emphasis, focusing on institutions and firms rather than national economic aggregates, and in method, generally failing to assess explanatory factors quantitatively and relate them to the general dynamic of the country's economy. As a result, these publications will occasionally serve as a source of hypotheses or findings rather than as a general theoretical inspiration.

1.2. Exports, competitiveness, convergence and divergence in the EU

The debate on competitiveness in the EU largely centres on Western Europe and explanations of divergence between the "core" and "periphery" of the Eurozone, surplus countries in the north and deficit countries in the south. A strand of writing sees the Eurozone (EZ) crisis as a kind of balance of payments crisis driven by divergences in labour costs : Lapavitsas and his coauthors (2012) thus argue that the EZ crisis was caused by Unit Labour Costs (ULC) rising faster in the southern, gracefully dubbed "PIGS", countries (Portugal, Italy, Greece, Spain) than in the EZ core (Germany, really). This led to current account deficits, mounting external indebtedness and a run on PIGS' sovereign bonds. This diagnosis was shared by policy-makers in EU institutions and shaped the policy response to the crisis : austerity and labour market deregulation was meant to put downward pressure on wages, thus restoring the struggling south's price competitiveness (see Storm and Naastepad, 2016, p. 60-63).

This reading of the crisis is questioned by many authors on the basis that ULC and relative prices in fact do not significatively impact export growth, which is fundamentally determined by non-price competitiveness, that is technological sophistication, quality or complexity. In this reading, the driving force behind divergence in the EZ is the difference in technological capabilities between north and south.

Storm and Naastepad (2014, 2016) thus argue that ULC only represents a small portion of production cost and ULC elasticities of exports are therefore too low to explain divergences in

export performance. Diverging rates of export growth are accounted for by “widening differentials in labour productivity and technological capabilities” (Storm and Naastepad, 2016, p. 63), with the southern periphery (and France) registering declines, relative to Germany, in the share of production in high and medium tech manufacturing and market services. Storm and Naastepad argue that labour market flexibilisation and declining wages, far from restoring the south’s competitiveness, would in fact lock it into low tech, low value-added activities by reducing incentives to invest in labour-saving, productivity increasing technology, and indeed to invest at all (Storm and Naastepad, 2014, p. 14).

The same line of argument is pursued by Jakob Kapeller, Claudius Gräbner-Radkowitsch and Philipp Heimberger in several articles, occasionally with additional coauthors. They analyse divergence in the EU and EZ in terms of technological capacity and its polarisation, showing that EZ countries can be grouped into a core, made up of Austria, Belgium, Finland, Luxembourg, Germany and the Netherlands, and a periphery made up of the PIGS countries, with France lying somewhere in the middle. These groups diverge in terms of income growth, unemployment rates, trade balances and private debt levels (Gräbner, Kapeller, Heimberger 2019, Gräbner et. al., 2020a). The core and periphery also diverge in terms of technological capabilities : the authors show that productive capacities are most unequally distributed in the lowest and highest categories in terms of technology and that the difference between the low-tech south and high-tech core is widening. The periphery’s backwardness puts it in competition with emerging countries in Asia, leading to losses of export market share, while the core is protected by its technological sophistication. The authors argue that wage levels in competitor countries are so low that reduction in wages would need to be extremely drastic in order to make the south competitive : the only plausible answer to the south’s woes is thus technological upgrading (Gräbner et. al., 2020a, pp. 656-657). In another series of articles, the trio and coauthors propose wider typologies of European economies beyond the EZ, classifying them into models that differ in terms of structural characteristics, specialisation and macroeconomic performance. They argue, on the basis of this classification, for policies adapted to the structural characteristics of different economies : public investment and industrial policies to upgrade the periphery’s productive base, expansionary fiscal policy and wage growth to rebalance trade in the core, and wage growth, labour protection and industrial policy in the Eastern “industrial workbench” to develop technological capacity and stimulate further catch-up growth(Gräbner-Radkowitsch et. al., 2022, Gräbner, Kapeller, Heimberger and Schütz, 2020b).

Finally, one last paper from Gräbner, Kapeller and Heimberger (2020), though not directly connected to the EU, is worth discussing in that it deals with the question of convergence. The authors show that in a sample of 108 countries over the period 1985-2014, the convergence of poorer countries towards richer ones is conditional on their technological capacities, and that this finding is robust to the addition of different confounding factors.

Other authors highlight, in a similar vein, the importance of non-price competitiveness, technology or quality. Romero and Bottega (2021) thus show that more technologically advanced products have more favourable income elasticities and are less impacted by price competition. In a series of papers for the European Commission, D’Adamo (2017, 2018) argues that improvements in quality, measured by the mark-up on costs, positively affect the export performance of EU countries, and that quality is in turn positively affected by income, high-tech inputs, the quality of institutions, capital stock and human capital. I will return, in the section covering my theoretical framework and

methodology, to several blaring issues with this measure of quality and these claims. Finally, Kohler and Stockhammer (2022) question the importance of price competitiveness on growth, remarking that countries whose ULC-based real exchange rates appreciated grew *faster* than their peers both before and after the GFC. They argue that it is house prices, not either price nor non-price competitiveness (measured by the ECI), that most significantly affected growth during this period.

In response to this literature disputing the focus on labour costs, several authors have reaffirmed the importance of either real effective exchange rates or ULC for export performance. Sascha Keil (2022) thus shows that using an econometric methodology that allows one to analyse the effects of *levels of* rather than *changes in* relative prices yields results that support the claim that price competitiveness matters for export growth. Real effective exchange rates (REERs) based on ULC are *negatively*, not positively, correlated with export growth for eleven Eurozone economies in 1995-2021. A similar point is made by Boggio and Barbieri (2016) : it is primarily the level of, not changes in, ULC that affects a countries' share of export markets. Pariboni and Paternesi Meloni (2022) likewise stress that relative prices do have an effect : both the level of and changes in ULC-based REERs (depending on specification) are negatively correlated with export growth.

In a later article, Keil (2024b) analyses the relationship between European countries' Shares of Value Added in different sectors (VAS) and ULC. He detects a negative relationship between ULC and VAS and therefore concludes that labour costs are a factor in export competitiveness and the decisions of businesses regarding where to locate their production activities. Ederer and Reschenhofer (2018) likewise show that ULC are negatively correlated with VAS in export-oriented sectors, and therefore argue that the structural polarisation they and authors like Gräbner, Kapeller and Heimberger document is driven at least in part by countries' labour costs.

There is thus evidence to show, contrary to the claims of the literature that focuses on technological capabilities and productive structures as drivers of export growth, that labour costs do in fact matter for countries' trade performance. I will return to the question of what to make of this evidence, and in particular to the issue posed by the use of ULC in part 2 of this paper.

This bountiful literature discussing the role of competitiveness and technology in the performance of EU countries largely does not seek to quantify the impact of exports on income growth. The authors quoted generally simply point to a correspondence between trade patterns and macroeconomic performance or estimate the effects of given variables on export growth. In order to address this deficiency and relate export growth to the growth performance of the economies I study, I will rely on Thirlwall's model of Balance of Payments-Constrained Growth.

1.3. Balance of payments-constrained growth and European economies

The literature using the BOPCG model to investigate the converging or diverging dynamics of EU economies is much sparser than that discussing the determinants of export performance. Romero and McCombie (2016) estimate a version of the model that breaks down countries' trade into sectors and show the model to be a good predictor of fourteen European countries' growth performance over the years 1984-2007. They also show that higher-tech sectors benefit from higher income elasticities and therefore offer more income growth potential.

Two further articles use Thirlwall's balance of payments constrained growth model to examine the economic performances of European economies, specifically Italy and Central Eastern Europe, (CEE) over the period I study, by Alberto Bagnai (2016) and Peter Lesko and Eva Muchova (2020).

In the Italian case, Bagnai finds that the decline of Italy's productivity growth in the 1990s was caused by adverse shocks to the Balance of Payments constraint : an increase in the country's imports and a decline in its export growth. The author finds that the decline in Italian export performance was driven by weaker growth of trading partners, which he hypothesises may have been supplemented by a fall in competitiveness, apparent in a drop of the income elasticity of exports.

Lesko and Muchova find that the BOPCG model is a good predictor of observed income growth rates in Eastern European countries. They argue, however, that the observed convergence is unsustainable from a BOPCG perspective : the growth of their income exceeded rates compatible with balance of payments equilibrium, causing external deficits that are not sustainable in the longer term. The authors link this to the income elasticities of exports and imports for these countries, which, in the BOPCG model, together with the growth of foreign income, determine the sustainable growth rate. They argue that the observed elasticities are a sign of the lack of non-price competitiveness of some of the countries, namely Poland, Croatia and Romania. They show, however, that technological competitiveness is improving for the region as a whole, as reflected in the exported goods and the change in the income elasticities.

I expand on the approach taken in these contributions in several ways : first, the period and sample I study is not quite the same : Bagnai examines a longer and earlier period, from 1970 to 2010, and focuses exclusively on Italy, while Lesko and Muchova cover data from 1995 to 2014 and for eleven CEE countries. In the section dedicated to trade and balance of payments dynamics, I take a comparative approach to fourteen countries, half from Eastern and half from Western Europe. Second, I place more emphasis on the questions of competitiveness and the composition of my countries' exports and imports.

2. Research question, theoretical framework and methodology

2.1. Research question, hypotheses and study design

The aim of the paper is to investigate the role of my countries' export performance in their economic dynamics, and to evaluate the part played by price and non-price competitiveness in the evolution of their exports. The metric I use to evaluate convergence, divergence and economic performance are levels and growth rates of real per capita GDP. When discussing the dynamics of exports and imports in part three, I use per capita measures of exports and imports in order to better measure the impact of economic dynamics on individuals' standard of living and relate economic flows to countries' populations. This makes a difference especially in the cases of Bulgaria, Romania and Croatia, which saw sizeable declines in their population over the three decades considered. What I refer to as convergence is the faster growth of Eastern European countries compared to their richer Western counterparts. Divergence in turn denotes the difference in growth

rates between countries within the same region and starting with similar pet capita income levels, for example Bulgaria and Poland or Italy and the Netherlands.

My hypotheses are the following :

H1 : Export dynamics played an important role in dynamics of convergence and divergence in the EU.

H2 : The convergence of Eastern European countries over this period was driven by price competitiveness.

H3 : Differences in growth rates within Western and Eastern Europe were due to differences in non-price competitiveness.

I will thus argue that both types of competitiveness matter. This is quite intuitive and seemingly uncontroversial but carries implications for European economic policy.

I examine my hypotheses by analysing the export and growth dynamic of fourteen EU member states, chosen to form two groups with relatively similar starting incomes levels and divergent growth trajectories. The Western group is formed by Germany, France, Italy, Belgium, the Netherlands, the United Kingdom and Austria : the first five are founding members of the European Economic Community, the UK joined it in 1973, and Austria is a longstanding trading partner of Western Europe and fellow early industrialiser. In 1990, these countries had similar levels of per capita income. Portugal, Spain and Greece, often taken as examples of countries diverging from the European "Core" (e.g. by Gräbner, Kapeller and Heimberger, 2019), were not included as a result of their much lower per capita income levels, putting them closer the richer countries in the Eastern bloc than to the Western core. The Eastern group is made up of Poland, Czechia, Slovakia, Hungary, Romania, Bulgaria and Croatia, countries that were part of the Eastern Bloc during the Cold War and joined the EU between 2004 and 2013. Differences in income in 1990 were larger in this group than in the Western one, with Czechia being 2,5 times as rich as Bulgaria.

To evaluate my hypotheses, I proceed in two steps. In the third section of the paper, I apply the BOPCG model to the fourteen countries selected, discuss its implications in terms of growth performance and examine whether balance of payments adjustment in deficit countries takes place, as hypothesised by Thirlwall, through a reduction in income or income growth. In the fourth section, I analyse different indicators and explanations of competitiveness, discussing my second and third hypotheses as well as drawing methodological implications.

In the rest of this section, I spell out the theoretical framework that forms the basis for my hypotheses and discuss my methodology. I start with the discussion of a causal framework to underlie the balance of payments-constrained growth model and follow with a discussion of measures of export competitiveness.

2.2. The balance of payments constraint

As theorised by Thirlwall (2011) and acknowledged, but not really discussed, by GMP theorists (Baccaro and Pontusson, 2016, Baccaro, Pontusson and Blyth, 2022), a country's growth rate is limited by its export performance. It is not sustainable for countries to run prolonged current account deficits, and as imports rise with income, GDP growth requires export growth in order to

pay for rising imports. Exports thus matter for domestic-demand led economies, not just export-led ones. Furthermore, as theorised by post-keynesian authors such as Nicholas Kaldor, countries' exporting industries matter for growth as an engine of productivity improvements through returns to scale, learning by doing and linkages to other sectors. A narrow focus on whether an economy is a net exporter occludes these questions. For instance, GMP authors classify Poland as a domestic demand-led economy from the 1990s until the Global Financial Crisis (GFC) on the basis that it ran a trade deficit over most of the period, and domestic demand was therefore driving its growth. Yet between 1991 and 2008, Polish exports nearly doubled as a percentage of GDP, and increased almost fourfold in real terms, thereby growing twice as fast as those of "export-led" Germany. Without this export performance, the country's income growth would have caused a massive trade and unsustainable deficit.

According to Thirlwall's model of Balance of Payments-Constrained Growth, export growth matters for income growth primarily because it alleviates the balance of payments (BOP) constraint : because imports are a function of income, and a trade deficit is unsustainable in the long term, a country whose income is growing needs exports to grow in order to pay for its imports.

Thirlwall's model starts from equation (1), specifying the condition for balance of payments equilibrium, with export growth being equal to import growth.

(1) $x = m$

Taking imports to be a function of income, we substitute them in equation (2) for the product of the growth rate of income, y, by the income elasticity of imports π.

(2) $x = y*\pi$

We can then rearrange the equation to obtain the growth rate compatible with equilibrium on the balance of payments in equation (3). For the sake of brevity, I will refer to it as the BOP-sustainable growth rate.

(3) $y=x/\pi$

This model rests on a set of assumptions : first, equation (1) is the condition for equilibrium only if trade is balanced at the start of the period. If it is not, exports and imports growing at identical rates will yield a growing trade imbalance. Thus, if a country starts with a trade surplus, equation (3) will underestimate the sustainable growth rate, while if the country starts with a deficit, it will overestimate it. Second, equation (1) really gives the condition for equilibrium on the trade account, not the current account. Depending on a country's external position and funds flowing in (or out) through remittances or capital income, it may need less (or more) exports to finance its imports. This may, again, bias the estimated growth rate. Third, if we also consider the financial and capital account, a country could theoretically run a current account deficit indefinitely, selling foreign or domestic assets to finance it. Thirlwall argues that this factor is of little importance : the magnitudes of current account deficits that are sustainable make little difference to sustainable growth rates estimated by the model (Thirlwall, 2011, pp. 37).

Taking equation (2), we can also substitute export growth for its determinants, foreign income y_f and the income elasticity of demand for exports Ω, yielding equation (4).

(4) $y_f * \Omega = y * \pi$

The left hand side of this equation is an export demand function, and the right hand side an import demand function. Presenting them in this form makes clear another limit of the version of Thirlwall's model that I am using : the omission of price considerations. Standard export and import equations take into account not only incomes but prices : the BOPCG equation (3), in an expanded version, includes terms for changes in relative prices and price elasticities. I abstract from this factor in the BOPCG estimations and deal with price and non-price determinants of export growth in a separate section, when I discuss estimations of the export equations. This omission is also justified by an empirical finding of the literature Thirlwall discusses in a 2011 article : "it is shown overwhelmingly that relative price changes or real exchange rate changes are not an efficient balance of payments adjustment mechanism either because the degree of long-run change is small, or the price elasticities of exports and imports are low. It is income that adjusts to maintain balance of payments equilibrium (or a sustainable deficit)." (p. 32).

As discussed by Blecker and Setterfield (2019, pp. 433-436), neoclassical growth models propose an alternative to Thirlwall's view of the relationship between the balance of payments and income growth. In this view, income growth is entirely exogenous to the balance of payments and given by the growth of productivity and the labour force. Productivity growth is not affected, as in the Kaldorian view explored below, by increasing returns to scale made possible by exports, but determined exogenously by technological progress. The balance of payments thus automatically adjusts through changes in the real exchange rate. In this view, faster income growth in a country, all other things being equal, will lead to sustained depreciation as demand for imports increases more than demand for exports. Depreciation leaves income growth unaffected and only impacts the trade balance, restoring its equilibrium. One can take issue with the coherence of this view : it seems real income cannot be independent of the exchange rate, especially in heavily internationally integrated economies. A continuously depreciating real exchange rate would thus functionally be the same as a reduction in income growth : imports making up an important part of consumption would be getting more expensive. The neoclassical solution is thus analytically similar to the Thirlwallian one, with real income adjusting to maintain equilibrium on the trade account. Besides the observed stability of real exchange rates (Thirlwall, 2011, p. 32), there is another reason for doubting that relative prices can drive BOP adjustment : in order for depreciation to lead to an improvement of the trade balance, the Marshall-Lerner condition must be fulfilled (the sum of the absolute values of the price elasticities of exports and imports must be higher than unity), which is not necessarily the case (Bottega, Romero 2021).

The question of the adjustment mechanism can also be investigated empirically : in parts 3.2-3.3 of this paper, I briefly examine whether the external balance of deficit countries in my sample is restored through depreciation, as in the neoclassical model, or a reduction in income or income growth, as predicted by Thirlwall.

Another view of the relationship between income growth and the balance of payments is given by Paul Krugman's (1989) "45 degree rule". Krugman observes the regularity expressed by equation (5) below, a rearrangement of equation (4) : the ratios between countries' growth rates tend to approximate those of their income elasticities of demand for exports.

(5) $y/y_f = \Omega/\pi$

Unlike Thirlwall, however, he argues that because “we all know that differences in growth rates between countries are determined in the rate of growth of total factor productivity” and “it is hard to see what channel links balance of payments […] to total factor productivity growth” (p. 1037), it is income growth that determines countries’ income elasticities of demand for exports, not the opposite : income growth is exogenous to the balance of payments. In Krugman’s view, income growth leads to a diversification of production, thereby endogenously increasing the economy’s income elasticity of demand for exports. This hypothesis is examined by Bottega and Romero (2021), who test whether product variety, measured (somewhat questionably) by a ratio of the country’s patent stock to the sample’s total patent stock, is related to the income elasticity of demand for exports, and find no significant relationship. Addressing this hypothesis thoroughly lies outside the scope of this paper. I now turn to indirectly answer Krugman’s argument by outlining the causal channels that could plausibly link the balance of payments to productivity growth.

Thirlwall’s model specifies a first way in which exports matter for income growth : they alleviate the constraint exercised by the balance of payments by allowing a country to finance the imports that come with growing income.

The second way in which exports matter for income growth is through their potential for driving productivity improvements. This has been theorised by authors such as Gunnar Myrdal, Nicholas Kaldor and Petrus Johannes Verdoorn, and rests primarily on the characteristics of manufacturing compared to other sectors (Blecker and Setterfield, 2019, pp. 378-386). Verdoorn’s law thus states that increases of labour productivity are a positive function of manufacturing output due to the sector’s increasing returns to scale, while Kaldor emphasised other growth enhancing aspects of manufacturing : its potential for productivity-increasing innovations, linkages to other sectors, and positive externalities in the form of skills and knowledge transferable to other firms or sectors. This last element can be part of the explanation for the historical clustering of manufacturing in certain countries or areas : the sector requires certain skills that it helps produce, and manufacturing therefore tends to attract more manufacturing. Finally, and importantly for the link to exports :

> manufacturing also offers significant advantages on the demand side. Engel’s law implies that, as per capita income rises, households spend a decreasing share of their income on food and a higher share on manufactured goods. As a result, the income elasticity of demand is higher for manufactures than for food, which implies greater potential for long-run growth in manufacturing production than in agriculture (Ibid., p. 381).

According to this theoretical tradition, manufacturing is the main driver of productivity growth through its increasing returns to scale and its higher income elasticity of demand which mean a faster growing market than other sectors. Exports are the means for domestic manufacturing to access an expanding market, independent from the size of the national economy. As none other than Adam Smith put it :

> By means of [foreign trade] the narrowness of the home market does not hinder the division of labour in any particular branch of art or manufacture from being carried to the highest perfection. By opening a more extensive market for whatever part of the produce of their labour may exceed the home consumption, it encourages them to

> improve its productive powers, and to augment its annual produce to the utmost, and thereby to increase the real revenue and wealth of the society. These great and important services foreign trade is continually occupied in performing to all the different countries between which it is carried on. (Smith, 1776, Book IV, Chapter I)

Exports thus have two roles in allowing and driving growth. First, they alleviate the BOP constraint, allowing an economy's income to grow and its imports to follow. Second, they drive rising productivity through increasing returns to scale and access to a larger market.

Figure 2. below illustrates the functioning of my causal framework of the functioning of the BOP constraint and the effects of exports on GDP growth.

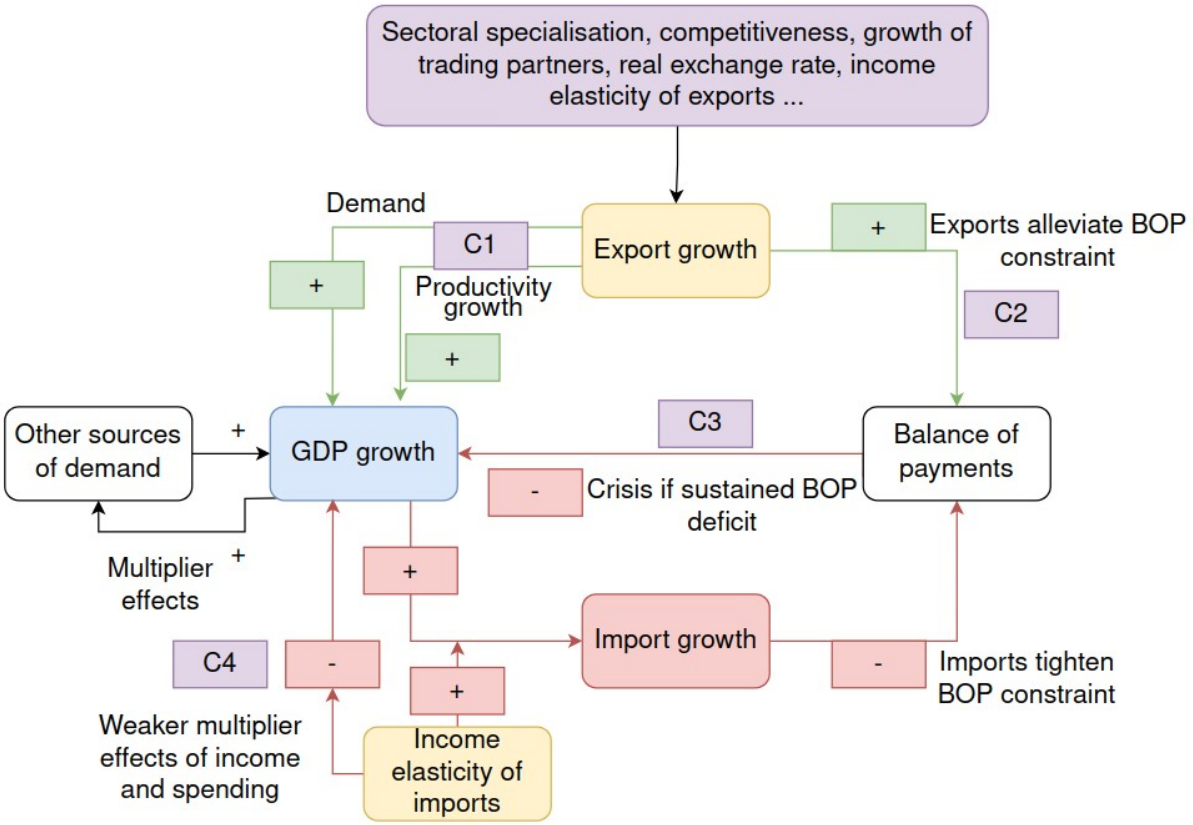


Figure 2. The causal framework underlying the BOPCG model. Source : Author's elaboration, based on Thirlwall, 2011, Blecker and Setterfield, 2019.

In purple are highlighted the causal channels discussed below and the determinants of export growth. In green are the growth enhancing effects, in red the contractionary effects. The yellow boxes are the denominator and numerator of equation (3), the BOP-sustainable growth rate equation. In blue is the dependent variable, income growth.

The first causal channel through which exports drive productivity growth and thereby income, as outlined above, is fairly straightforward. I will call this causal channel C1 :

C1 : Export growth drives output growth through access to large markets and productivity growth through increasing returns to scale.

Exports also allow an economy to finance the imports that are a function of domestic incomes. This is channel C2 :

C2 : Export growth allows income growth by allowing an economy to finance the imports that higher income calls forth.

How does the denominator of equation (3), the income elasticity of imports, constrain growth, and how does the balance of payments constraint bind ? In the BOPCG literature, this is less clear. Thirlwall thus writes that “In the long run, no country can grow faster than that rate consistent with balance of payments equilibrium on current account unless it can finance ever-growing deficits which, in general, it cannot. There is a limit to the deficit/GDP ratio, and international debt/GDP ratio, beyond which financial markets get nervous (2011, p. 15)”. This corresponds in Figure 1. to the direct arrow from the “Balance of Payments” box to GDP growth. It we take it to mean that growth in excess of the sustainable rate is brought to an end by a balance of payments crisis, this is not a satisfactory explanation for why countries in general do not grow beyond that sustainable rate : the model fits quite well for all fourteen countries in my sample, and not all of them ran into a balance of payments crisis, far from it.

One could imagine other causal channels through which the BOP constraint would bind : political authorities might for example react to a current account deficit with austerity measures, bringing income growth back into a sustainable trajectory (sustainable from a BOP perspective, not a *not having a 40% youth unemployment rate* perspective). One could argue that this is what happened to Italy and the rest of the Eurozone south when the countries’ governments, more or less coerced by the Troika, applied harsh austerity following the GFC and EZ crises (Panico and Purificato, 2013). Then again, policymakers were reacting not so much to a current account deficit as to high public debt burdens and a run on their sovereign bonds. As we’ve seen in part two, a certain strand of writing on the EZ crisis indeed describes it as a sort of balance of payments crisis (e.g. Lapavitsas et. al., 2012). In this view, causality ran from the left to the right hand side of equation (6) below : a current account deficit, with imports exceeding exports and income flows from abroad, causes a deterioration in the private balance, with investment exceeding saving. The resulting private debt, unsustainable after the GFC shook credit markets and caused a recession, then caused public debt to balloon as governments rescued their banking systems, which then led to the EZ crisis.

(6) $X – M + NFIA = (S – I) + (T-G)$

This reading is questioned by authors who point to the driving role of credit and debt rather than labour costs or inflation differentials. Storm (2016) thus points out several issues with this argument, including that labour costs only account for a small part of production costs and that they only started rising in the PIGS countries *after* the current account deteriorated, which is more coherent with debt causing an external deficit than the inverse. In this view, a credit boom caused an expansion in demand, which led to a rise in both imports and labour costs as wages rose in the boom : the causality runs from right to left in equation (6). Michalis Nikiforos (2016) holds yet another view : in his reading, Greece’s government deficit was a result of its external deficit. As the country’s competitiveness deteriorated, the private sector’s situation worsened and the government stepped in to support the economy : here, again, the causality runs left to right in equation (6).

What are the implications of these competing readings for causality in the BOPCG framework ? For Nikiforos, “The increasingly high external deficits may be seen as the cause of the deficits in the domestic sector. In fact, the latter only helped avoid a contractionary adjustment of GDP and became possible due to massive capital inflows to Greece and the low borrowing cost” (2016, p. 327). Unsustainable public spending thus served to temporarily get away from the balance of payments constraint : GDP growth would have adjusted downwards, towards a BOP-sustainable growth rate, if not for the public stimulus. This was enabled for a time by the financial architecture of the Eurozone, which drove down borrowing costs, but ultimately creditors lost confidence and forced through harsh austerity measures. For the “credit boom” reading spelled out by Storm (2016), the mechanism is similar : an unsustainable build-up of debt causes the economy to run away from its BOP-sustainable growth path until financial markets lose patience (or implode for unrelated reasons), which precipitates a crisis.

Even though the direction of causality between external imbalance and debt build-up is different in these two readings, the underlying hypotheses can be paraphrased as an explanation of the BOP constraint : there is a growth trajectory compatible with balance of payments equilibrium, a country may for a time venture above it at the cost of increasing debt, private or public, but it will run into financial trouble eventually. We thus have a third causal channel :

C3 : A country growing faster than is compatible with equilibrium on the balance of payments will eventually run into financial trouble and be forced by creditors to adjust.

Two remarks are in order : first, the cases of the four PIGS countries were different from each other and the discussion above should not be taken as an endorsement of the views of any of the authors outlined as a general theory of the EZ crisis, but as an exploration of plausible mechanisms through which the BOP constraint may bind. Second, this explanation seems to imply a view of a “natural” growth rate equivalent to the BOP-sustainable growth rate, which corresponds to the rate of growth of the productive capacity of an economy. A persistent trade deficit means an economy as a whole consumes more that it produces, and the corresponding external debt is unsustainable if the debt does not finance capacity-creating investment. One could depict a government financing its functioning expenses or the Spanish real estate boom as “unproductive” investment in this sense.

The causal mechanism C3 accounts for the countries which experienced debt crises and were forced to adjust through austerity measures. But is this the only adjustment mechanism ? If so, why did the countries which did not run into crises not breach the balance of payments constraint ? Nikiforos hints at an answer when he argues that Greece’s public deficit “only helped avoid a contractionary adjustment of GDP” in response to the external deficit, suggesting automatic adjustment of an economy towards BOP equilibrium, in line with the BOPCG model. Thirlwall quotes Kaldor on this mechanism :

> any rise in the share of imports in total domestic expenditure causes a fall in demand for home output, which in turn leads to a reduction in both consumption and investment in successive steps until a sufficient contraction occurs in the gross domestic product relative to exports to make the spontaneous rise in the one ratio be matched by an induced increase in the other (quoted in Thirlwall, 1997, p. 378).

An increase in imports, for a constant level of spending, thus means of fall in domestic income which will go on as long as income does not match spending. The adjustment mechanism is thus simply the correspondence between income and spending. In a closed system such as the global economy, this correspondence is necessarily complete. In an open economy, spending can only durably exceed income through the accumulation of debt or the sale of assets which cannot go on forever. One mechanism that limits economies' capacity to get into debt, C3, has been discussed above. What Nikiforos hints at and Kaldor explains is another, somewhat abstract but intuitive mechanism : spending tends not to exceed income as agents generally tend to avoid getting into unsustainable debt. This mechanism is plausible at a microeconomic level, and its generalisation to the macro level yields a fourth causal channel :

C4 : Agents tend to avoid getting into unsustainable debt. On a macroeconomic level, this tends to keep the balance of payments in equilibrium or in surplus as the economy collectively spends no more than it earns.

The income elasticity of demand for imports thus has a contractionary effect on the economy : the greater it is, the less an increase in income will benefit domestic producers and the smaller the multiplier effect of additional spending on income in the domestic economy.

We thus have the a causal model outlining the operation of the balance of payments constraint on growth and highlighting the role of exports through four causal channels : exports drive productivity and income growth through returns to scale and access to large markets (C1) and they allow income growth by financing imports (C2). The balance of payments constrains growth through balance of payments crises in case of unsustainable deficits and debt burdens (C3) and through a tendency for agents' spending not to exceed income, thereby keeping the BOP in balance (C4).

The BOPCG model thus allows us to conceptualise and quantify the relationship between exports and income growth. It does not, however, inform us on the determinants of income growth, to which I now turn.

2.3. Income elasticities and specialisation

Equation (4), reproduced below for the reader's convenience, is a simple reformulation of Thirlwall's BOPCG model but in fact predates it, originating in the work of Raul Prebisch and his centre-periphery model.

(4) $y_f*\Omega = y*\pi$

Prebisch was concerned with the differences in income growth and the divergence caused by countries' specialisation in different types of products. Countries in the core, historically industrialised, produced manufactured goods with higher income elasticities of demand than the agricultural products and raw materials produced by the periphery. The centre-periphery model assumes, like the BOPCG model, that trade must be balanced in the long run and that growth rates therefore depend on the income elasticities of demand for exports and imports. Rearranging equation (4) into equation (5), we see that the ratio of a country's growth rate to that of the rest of the world is equal to the ratio of the income elasticities of demand for their exports. In Prebisch's case, the model is an explanation of divergence between the core and periphery : Ω, the income

elasticity of demand for primary products, is lower than π, that for manufactured goods, and the core therefore grows faster than the periphery (Thirlwall, 2011, pp. 12-13).

(5) $y/y^f = \Omega/\pi$

Prebisch is part of a long line of economic thinkers who emphasise the importance of specialisation for economic growth. According to Eric Reinert, this theoretical tradition dates back to 17th century Napolitan thinker Antionio Serra, who first distinguished between activities with increasing and decreasing returns to scale (Reinert, 2003). Reinert classifies economic sectors into two categories, "schumpeterian" and "malthusian", with different characteristics both on the supply and the demand side. Schumpeterian activities benefit from increasing returns to scale, the potential for technological improvement and linkages and less competitive markets with price-setting firms, which creates the opportunity for increasing incomes from "technology-based rents which can be divided between capitalists, workers and the government" (Reinert, 2003, p. 12). Producers in malthusian activities, on the contrary, face perfect "commodity" competition and are therefore price-taking, facing volatile prices. They also suffer from decreasing returns and the lack of potential for technological improvement and linkages. Reinert's theses on schumpeterian activities recall Kaldor's views on the advantages of manufacturing, discussed above : both economists emphasise returns to scale, productivity improvements and linkages as important positive characteristics.

Sectoral specialisation is thus a potential explanation of differences in export growth among my countries. In order to assess this hypothesis, I examine the composition of exports of countries in my sample, checking if the faster export growth of Eastern countries compared to their Western neighbours can be accounted for by their specialisation in faster-growing sectors. This would fit Prebisch's view on the importance of specialisation but run counter to his thesis that it is rich core countries which specialise in faster-growing sectors. Somewhat more in line with Prebisch's views, I assess whether differences in specialisation can account for divergence within the Western and Eastern groups.

The views of Prebisch, Kaldor and Reinert also inform this paper's interest in non-price competitiveness, to the measurement of which the next subsection is dedicated.

2.4. Measures of competitiveness and export equations

2.4.1. Price and non-price competitiveness : definitions and difficulties

In the theories covered in the paper so far, illustrated by equation (4), export growth is a function of foreign income growth and the income elasticity of demand for exports (or export partners' income elasticity of imports).

The income elasticity of demand for exports is often taken as a measure of non-price competitiveness. Non-price competitiveness (NPC) is defined by Sascha Keil as "the multi-dimensional entirety of factors not connected to prices that shapes the demand as well as the supply side of the economy" (2024a, p. 2). This negative definition is not much to go on, but speaks to the difficulty of measuring and even defining NPC, which is often associated with quality, technological sophistication or innovativeness. Those characteristics are subjective and, in the case

of quality, by definition unquantifiable[1]. The basic intuition underlying the concept is that goods compete not just on price, which one can measure, but also non-price characteristics such as convenience, functionalities, taste or aesthetics. Furthermore, producing different goods should create different incomes : we intuitively understand that workers in high-tech auto, aerospace or capital goods industries earn more than those in textiles or on sugar cane plantations. This idea underlies Prebisch's thesis on the importance of specialisation and income elasticities of demand for different goods.

The concept of NPC allows us to investigate whether an economy's technological capabilities or the nature of what it produces impact its export performance : surely, whether an economy makes high-end cars or handbags matters. The concept also implies the possibility of success not through reducing costs, which is the usual meaning "competitiveness" evokes, but through increasing skills, investing in technology and entering high value added sectors.

Both price and non-price competitiveness pose great difficulties in measurement. NPC makes intuitive sense but is defined quite vaguely and in a way that makes quantifying it hard or by definition impossible, especially on the aggregate level of an economy that produces many different goods and services. Price competitiveness might seem easier to quantify, but comes with a related set of issues. Price comparisons are only meaningful for goods that are of a comparable nature, have a similar function : while an apple and an orange may be substitutes and compete on price with each other to some extent, an apple and a smart watch clearly do not. Discussing competitiveness therefore only makes sense when one is controlling, in some way, for the nature or quality of goods. The converse is also true : as goods compete on both price and quality, a firm's NPC should only be measurable if one is controlling for its prices relative to competitors.

It is important to emphasise another difficulty : it is hard to disentangle price and non-price factors. Though NPC is defined is opposition to price competitiveness and therefore something quite distinct from it (Keil defines it as "the entirety of factors *not connected to prices*"), what are thought of as non-price factors, such as quality or technological sophistication, do in fact affect price : a high quality automobile is costlier to produce than a lower quality one and should sell at a higher price. The difficulty of disentangling price from non-price factors will become apparent in the discussion of residual-based measures of non-price competitiveness.

Measures of NPC fall in two categories : residual-based measures and proxies (Keil, 2024a, pp. 2-3). Residual-based measures seek to quantify the part of an economy's export growth that is due to price factors, and attribute the rest to NPC. Proxy-based measures, as their name suggests, take different measures such as Total Factor Productivity (TFP), Gross Expenditures on Research and Development (GERD), number of patents granted to residents of a country, the economy's capital stock or Economic Complexity Index (ECI) as proxies of NPC. In this paper, following Keil (2024a), I examine the price and non-price competitiveness of the fourteen countries in my sample using both residual and proxy-based measures.

1 Etymologically, quality may be translated as something like *how-ness*. This is the literal meaning of the Polish word for quality, *jakość*, as opposed to *ilość*, for quantity, which translates to how-*many*-*ness*.

2.4.2. Residual-based measures of non-price competitiveness

Residual-based measures aim to measure non price-competitiveness by estimating the effects on exports of prices and taking the unexplained part of growth as a sign of NPC. I argue that these approaches fail to adequately account for price competitiveness and are therefore not as informative as some authors argue on non-price competitiveness. I review three residual-based ways to account for NPC : price elasticities, income elasticities and a measure based on Trade Frictions export models.

Baccaro and Pontusson (2016) use something like a very simple residual-based measure of NPC, centred on price elasticities of exports : they assess, through a regression of export growth on changes in a country's REER, whether a country's exports are sensitive to relative price changes. If the price elasticity is not significant, they conclude the country has high non-price competitiveness, since price rises do not harm its export performance. This does not necessarily hold : one could imagine a country – indeed, in the course of the paper the reader will come to imagine several – so price-competitive that rising prices would not for a while harm its competitiveness. The insensitivity of export growth to appreciation is thus a sign of competitiveness in general. Furthermore, regressing export growth on REER changes could capture not only price but income effects : if some sort of crisis befalls country A's trading partner, country B, its currency could depreciate or its prices fall. The fall in A's exports would thus be correlated with a rise in its REER, but could not be said to have been caused by it : the fall in demand in country B, not the depreciation, would be the root cause.

Other authors estimate Standard Export Equations, SEEs, to estimate the effects on export growth of both income and price factors, and as a base for measuring NPC. SEEs take the form of a regression of exports on foreign demand and the REER. The model I will estimate uses rates of change, rather than levels, of both the dependent and the independent variables as they are all integrated of order one.

The variable used for foreign demand is either the GDP or the imports of trade partners, which are then weighted based on the partners' shares of the home country's exports. REER is constructed in a similar fashion : it is an average of the ratios of price deflators of the exporting country to those of competitors, weighted on the basis of the competitors' share in the home country's imports and their market share in markets where the home country exports.

There are several problems with the use of the change in REER to measure price competitiveness. First, as noted above, using *changes* in relative prices as an independent variable does not allow one to account for the *level* of relative prices : a country may be experiencing real appreciation against a group of competitors but still be very price-competitive if its wages and prices were much lower to start with.

Some authors take into account the argument that it is levels of and not changes in relative prices that matter for export performance (Boggio and Barbieri, 2016, Pariboni and Paternesi Meloni, 2022, Keil, 2022). Using ARDL econometric models, they find that REERs are a better predictor of export performance when one uses *levels of*, not *changes in* them as a variable. These papers face, however, several limitations. First, REER indicators are normalised based on a given year, meaning that even if one were to use the level of REER, not the change in it, one would still only get

information on changes in relative prices compared to a base year, not their levels, i.e. whether a country's prices are lower or higher than another's. Indeed, a comparison of relative prices of two economies *in general* is not necessarily meaningful : one can compare across borders the price of a world famous burger or any other given good, but comparing price levels *across the entirety of an economy* may not be very informative as to the competitiveness of exports. Higher price levels of consumer goods and labour intensive services may for example result from higher wages and rents resulting from higher productivity, or from concentration in an economy's retail sector. Measuring levels of relative prices is thus complex on a conceptual level and in any case not really done by REER indicators.

The papers seeking to estimate the effect of changes in levels of relative prices face an additional problem : they often use REERs deflated by ULC, which is not a measure of price change at all. Unit labour costs, as shown in equation (7), are a ratio of wages in a sector divided by gross value added in that sector, or the average wage divided by productivity.

(7) $ULC = W_S/GVA_S = W/Q$

As the denominator is a measure of value added, ULC are not a pure measure of cost : a country with higher wages can have lower ULC if its workers are more productive, and productivity, because it is measured by market value (or imputation), is a problematic concept in the context of measuring price competitiveness. A more productive worker does not produce more products than a less productive one, which would make them cost-competitive were they paid the same, but more value, which can correspond to more products, more expensive products (because of quality, market power or other factors) or a combination of the two. ULC also does not account for the fact that labour costs can represent a different fraction of production costs for different producers, and their increase can therefore have very different impacts on profits and prices (Storm and Naastepad, 2016). Furthermore, when Real ULC are used, they are problematic for the same reason as REER : RULC are normalised based on the value for a given year, therefore containing information on the change in ULC but not their level. A change in ULC, in turn, can correspond to changes in wages, productivity or both. An appreciating ULC-based REER can thus mean nominal appreciation, higher wage growth, lower productivity growth or any combination of those factors.

Furthermore, productivity and value added in a country can depend on demand conditions rather than what we intuitively understand by productivity, i.e. workers' *capacity* to produce. For example, Keil (2024b) finds ULC to be negatively correlated with European countries' shares of manufacturing value added and concludes that labour costs "play a pivotal role in shaping the regional distribution of manufacturing value added by influencing both export dynamics and business relocation decisions" (p. 197). This correlation could very well be a case of reverse causality : since value added is simply sales per worker, assuming stickiness in wages and employment, a reduction or slower growth in value added would by definition translate to higher ULC. Rising ULC or ULC-based REER can therefore be a sign, rather a cause, of export stagnation. Unit Labour Costs, in other words, are impacted by changes not only in costs but also in units. For all these reasons, ULC, RULC and ULC-based REERs are not good indicators of price competitiveness.

Because ULC-based REERs take into account not only differences in wage growth (a price factor) but also differences in productivity growth (not a price factor), I will prefer CPI-based REER

measures. These are also problematic in that Consumer Price Indices take into account, and may be distorted by, prices of non-tradable goods and services, and they do not take into account intermediate and capital goods, but I believe them to be less problematic than ULC as a measure of changes in relative prices in that they are at least a measure of prices. I will assess the effects of changes in relative prices using SEEs, but also examine through descriptive evidence whether levels of REER impact export performance. In so doing, I will consider that a lack of impact of relative prices on exports, or a smaller impact, shows some kind of competitiveness : a country's products not being affected adversely by price rises means that they are competitive enough, either in a price or a non-price way, to still be in demand when prices rise.

A similar argument can be opposed to another view found in the literature : the claim that income elasticities of exports are a measure of NPC. This is an assumption of Prebisch's centre-periphery model and an argument Storm (2016) makes about the competitiveness, or lack thereof, of the PIGS countries, who suffer from their specialisation in lower-tech (lower NPC) goods. Prebisch's argument is based on the distinction between manufactured and primary goods, the latter having lower income elasticities of imports as richer populations spend less of their incomes on food and more on manufactured goods (Blecker and Setterfield, 2019, p. 381). The intuition is thus that higher-tech products are increasingly demanded as income grows, and can therefore deliver more export growth as their income elasticity of demand is higher. A country's exports can also, however, have a higher income elasticity of demand if they are more price-competitive : of two firms who produce televisions of similar quality, one would expect the one which sells them cheaper to benefit more as incomes rise and the market for televisions increases. Income elasticities of demand can thus be seen as a measure of competitiveness in general, not necessarily the non-price variety.

The last residual-based measure of NPC I discuss fares no better than price and income elasticities in "isolating" the effect of NPC by controlling for the effect of prices. Drawing on Xifré (2021), Keil (2024a) computes an NPC measure based on a Trade Frictions model of trade. The approach starts from equation (9), which expresses exports as a product of the REER, NPC and foreign import demand (FD). This equation can be rearranged to obtain an estimate of NPC, as in equation (10).

(9) $X = FD*REER^{-P}*NPC^{P}$

(10) $NPC=(XS*REER^{P})^{1/P}$ with $XS = X/FD$

NPC is then expressed as the product of the REER and export share : it is a measure of a country's export share given a certain level of relative prices. Two remarks are in order : first, this model rests on the assumption that the elasticities of exports in relation to the REER and NPC are identical. This assumes that price and quality are perfect substitutes, which is a heroic assumption but one one might as well make as quality is hard to define, impossible to observe directly, and this simplifies the model. Keil (2024a) sets the price elasticity to be equal to unity, on the basis of recent estimates and convenience.

The intuition behind this measure is the following : if a country experiences real appreciation and keeps a constant export share, or improves its export share without a decrease in relative prices, this corresponds to an improvement in NPC. This measure runs into the exact same problem as the ones previously examined : as the REER tells us nothing of the *level* of relative prices and therefore

price-competitiveness, a rise in export share given a certain REER does not mean that the economy has rising NPC. A price-competitive economy could be growing its export share by expanding production at a constant REER, thus improvings on this indicator without improving in quality, sophistication or technology. What this indicator measures, then, is something like *non depreciation-based market share*, a rise in which tells us that the economy is competitive in some, not necessarily non-price, way. When using it in subsequent parts of this paper, I will refer to it as the MS indicator as it mostly captures changes in market share. The MS indicator has two further problems : using it to compare countries' performance rests on the premise that REER elasticities of demand for exports are identical across economies, and that there is in fact an effect of the REER on exports. As I will show, it may in some – maybe even most – cases be fruitful to decompose the MS indicator and analyse separately the REER and export market share.

The residual-based measures of non-price competitiveness I have examined, based on estimating price and income elasticities of demand for exports, do not adequately capture non-price competitiveness due to the difficulty of controlling for price competitiveness, which NPC is defined in opposition to. Though these measures and export equations are not terribly helpful in measuring non-price competitiveness, they can still be useful as tools to describe the evolution of countries' exports as well as their relation to foreign demand and changes in relative prices. This leaves only proxy-based indicators to account for countries' non-price competitiveness.

2.4.3. Proxy-based indicators of non-price competitiveness

Proxy-based indicators of NPC are based on measurable factors which are thought to be related to non-price competitiveness. Sascha Keil (2024a) reviews and tests a series of such indicators, three of which I use in this paper.

Keil discusses a series of indicators that have been used as proxies for non-price competitiveness : the ratio of investment to GDP, measures of the capital stock, number of patents, the ratio of research and development expenditure to GDP, multi-factor productivity and the index of economic complexity. D'Adamo (2017) uses mark-up on costs as a proxy of quality. Keil finds the Economic Complexity Index (ECI) and the technology-based measures, Gross Expenditure on Research and Development (GERD) and patent stock, to be the most consistently positively related to export growth (Keil, 2024a). My choice of these three measures is justified by Keil's findings and theoretical considerations, which I will now expand on.

The ECI is constructed on the basis of trade data disaggregated by product category and based on the *diversity and ubiquity* of a country's exports, based on the idea that "Countries that are home to a great diversity of productive know-how, particularly complex specialised know-how, are able to produce a great diversity of sophisticated products" (Harvard Atlas of Economic Complexity). Diversity is thus meant as a measure of technical know-how and specialisation, while ubiquity is an indirect measure of how sophisticated a product is : the fewer the countries that export a certain product, the less ubiquitous and presumably the more sophisticated it is. The higher the diversity and the lower the ubiquity of a country's exports, therefore, the higher its ECI. The index therefore pertains to technological capacities, which as we've seen are often associated with NPC. D'Adamo's (2017) use of mark up on costs follows a similar intuition as the ubiquity component of the ECI : producers' mark-ups can be thought to measure their pricing power and therefore their

degree of technological sophistication as lower-tech products would face more price competition. Unfortunately, this metric can be distorted by transfer pricing practices of multinationals and therefore reflect the friendliness of an economy's fiscal environment rather than its technological capacities. It is damning and not wholly surprising in this regard that the two European countries which score highest on D'Adamo's quality ranking are Ireland and Cyprus.

The second and third proxies I use, GERD and patent applications of residents to the European Patent Office (EPO), are also closely associated with technology, the idea being that expenditure on R&D and patent applications drive and reflect firms' capacity to create products of higher quality (durability, convenience, new functionalities) that therefore create non-price competitiveness for the country's exports. These proxies have the disadvantage of assuming that firms produce, conduct research and register patents in the same jurisdictions and cannot account for countries benefiting from production with foreign technology.

To test my third hypothesis, that divergence within Eastern and Western Europe was caused by differences in NPC, I will use a *within-between* regression. When using panel data, such a regression allows to disaggregate the effects of a variable and estimate separately its capacity to explain differences between units of analysis and within them. In this context, such a regression will for instance allow me to examine both whether countries with higher ECI scores grew faster than those with lower ECI scores and whether the improvement or decline of a country's ECI can account for changes in its export performance.

In this rest of the paper, I examine the dynamics of convergence and divergence at play in fourteen European countries through the prism of the balance of payments constrained growth model before turning to the role of price and non-price competitiveness in the countries' export dynamics.

3. Convergence, divergence and the balance of payments

In this section, I examine the dynamics of convergence and divergence in fourteen EU countries through the prism of Thirlwall's model of Balance of Payments-Constrained Growth. First, I discuss estimates for the whole period and the importance of export growth and income elasticities of demand for imports for countries' per capita GDP growth. I then break down the thirty year period into subperiods and examine the adjustment process in deficit countries, examining whether rebalancing took place through adjustments in income growth, as in thirlwall's model, or exchange rates, as in a neoclassical growth model. I conclude that export growth, but also income elasticities of demand for imports played a sizeable role in both convergence and divergence in the EU over my period of interest.

3.1. Balance of Payments-Constrained Growth Estimates for the whole period

Table 1. shows the results of estimating the BOP-sustainable growth rate for the fourteen countries in my sample, following equation (3), restated below:

(3) $y=x/\pi$

Country	Income elasticity of imports	Export growth rate	BOP-sustainable growth rate	Observed growth rate
Western Europe	**2.67**	**3.41**	**1.30**	**1.21**
Italy	3.13	2.72	0.87	0.49
France	2.60	2.49	0.96	1.05
Germany	3.10	3.75	1.21	1.23
United Kingdom	2.49	3.49	1.40	1.48
Austria	2.36	3.82	1.62	1.38
Belgium	2.30	3.26	1.42	1.31
Netherlands	2.72	4.36	1.60	1.54
Eastern Europe	**2.20**	**6.93**	**3.32**	**3.02**
Poland	1.88	7.76	4.12	4.15
Bulgaria	2.12	6.01	2.83	2.52
Romania	1.54	6.24	4.05	2.83
Czechia	3.23	6.70	2.07	1.95
Hungary	3.11	9.04	2.91	2.85
Slovakia	1.74	7.27	4.18	4.00
Croatia	1.75	5.46	3.11	2.84

Table 1. BOP-sustainable yearly real GDP per capita growth rates estimation for the years 1990-2019, using Thirlwall's Balance of Payments-Constrained Growth model. Source: Author's computations, data from Ameco as for Figure 1., time series for exports and imports start in 1995 for Hungary and 1994 for Slovakia. The growth rates are geometric averages, while the income elasticity is the coefficient from a log-log regression of imports on income, both per capita.

Several results are worth noting : first, the model's estimated growth rates are generally quite close to the mark, with a standard deviation from the observed growth rates of 0.22 (0.16 when excluding Romania, the starkest outlier). The discrepancies are largest in the cases of Italy and Romania. In the Italian case, the difference between the observed and estimated growth rate can be explained by the country's trade surplus, averaging 1,5% of GDP over the period : according to the model, the country could simply have grown faster without facing an unsustainable balance of payments deficit. In the Romanian case, the explanation lies partly in the assumptions of the model outlined in section 2.3 : the condition for BOP equilibrium in the model, outlined in equation (1), is that exports and imports grow at equal rates. This, however, only yields BOP equilibrium if exports and imports at the beginning of the period are balanced. In Romania, this was not the case : in 1990, exports only amounted to two thirds of imports. As a result, the model overestimates the income growth compatible with balanced trade. When one takes as a starting point for export growth the hypothetical level at which exports would have needed to be in 1990 for trade to be balanced, the estimated BOP-sustainable yearly growth rate yields 3,09% rather than 4,05%, much closer to the observed rate of 2,83%. The remaining discrepancy is puzzling given the country's persistent trade

deficit, averaging 6% of GDP during the period and reaching a vertiginous peak at 14% in 2007 : a deficit country should be growing faster than its BOP-sustainable rate, not slower.

The model's overall good fit strengthens the case that the Balance of Payments Constraint is binding in the long run : countries may be able to outperform the BOP-sustainable growth rate and run BOP deficits for some time, but over a period of thirty years, export growth and the income elasticity of demand for imports are good predictors of growth performance.

The second result to note is what the model has to say about dynamics of convergence and divergence. The estimated and observed yearly growth rates are respectively 1,3 and 1,21% for the Western countries and 3,32 and 3,02% for the Eastern ones. The convergence dynamic is quite clear, with every Eastern country having a higher estimated and observed growth rate than every Western one. Yet there is divergence within these groups : Italy thus grew three times less than the Netherlands, the West's best performer, while Poland's growth was faster by half than Bulgaria's (and twice as fast as Czechia's, but this also amounts to convergence as this country started the period with over twice Poland's per capita income).

Both export growth and income elasticities of imports are important in the convergence dynamics. Not only did the East's exports thus grow twice as fast as the West's, its income elasticities of demand for imports were also lower by a fifth, which amounted to estimated growth rates being 2.5 times higher. Excluding Czechia and Hungary, the East's richest countries in the early 1990s, the East's income elasticities were nearly twice lower than the West's. Both factors also play into divergence within country groups : France thus had a higher BOP-sustainable growth rate than Italy, despite slower export growth, due to its lower income elasticity of imports, while the difference in income growth between Hungary and Czechia was mostly due to the former's faster export growth. This paper focuses on export growth and an investigation of the determinants of income elasticities of demand for imports therefore falls outside its scope. This result points, however, to the importance of income elasticities of imports in countries' growth prospects.

The estimation of the BOPCG equation for 1990-2019 points to the good fit of the model and thus the importance of both export growth and income elasticities of demand for imports for countries' growth performance. In the next subsection, I break down the decades surveyed into subperiods, examining the evolution of income, exports and imports and the adjustment of deficit countries.

3.2. Variations in BOP dynamics throughout the period

Table 2 shows the dynamics of trade and income growth over three subperiods for the fourteen countries in my sample. The years 2000 and 2008 were selected as breaks because many countries experienced breaks in their economic trends at those times. As visible on Figure 3, in or around 2000, Poland experienced a slowdown in its GDP growth, Romania, Bulgaria, Slovakia, Czechia and Croatia started growing at a stable rate, while growth slowed in Italy, France, Belgium, Austria and the Netherlands. The GFC marks a second clear break, and trends in the following decade show the consequences of the crisis and the following slowdown, especially in the West. The third period starts in 2009, not 2008, in order to exclude from the growth rates the fall in all variables in 2008-2009 and give a picture of the post GFC trends rather than the crash and post-crisis trends, which a table would not allow me to disentangle.

Country	1990-2000				2000-2008				2009-2019			
	x	m	y	TB	x	m	y	TB	x	m	y	TB
Western Europe	**5.4**	**5.0**	**2.0**	**1.4**	**3.2**	**3.1**	**1.3**	**2.4**	**3.5**	**3.4**	**1.0**	**2.9**
Italy	6.3	6.0	1.6	2.4	1.0	1.8	0.4	0.2	3.8	2.3	0.2	1.6
France	4.9	4.0	1.7	1.4	0.8	1.9	1.0	0.6	3.4	3.4	0.9	-1.1
Germany	4.4	4.1	1.4	0.3	5.9	4.1	1.4	4.3	3.8	3.9	1.6	6.2
United Kingdom	5.8	5.6	2.3	1.6	3.4	3.6	1.6	0.3	2.7	3.3	1.3	-0.4
Austria	5.1	4.2	2.2	-2.0	4.9	3.8	1.7	2.2	3.7	3.6	0.9	3.7
Belgium	5.0	4.7	1.9	-0.1	3.2	3.0	1.5	2.5	3.2	3.4	1.0	1.1
Netherlands	6.6	6.7	2.7	5.8	3.6	3.5	1.6	6.7	4.2	4.1	1.0	9.5
Eastern Europe	**6.9**	**7.8**	**2.1**	**-1.7**	**10.4**	**11.2**	**5.4**	**-5.6**	**6.8**	**5.8**	**2.9**	**1.5**
Poland	7.8	9.5	4.9	-1.8	8.5	7.4	4.1	-3.3	8.0	6.7	3.8	1.3
Bulgaria	3.1	7.3	-1.1	5.0	12.0	14.6	6.9	-12.7	7.3	4.8	2.9	0.0
Romania	2.4	0.5	-0.9	-5.5	10.4	12.9	7.8	-9.4	8.2	6.8	3.6	-3.3
Czechia	6.1	7.3	0.6	2.7	11.0	11.0	4.1	0.8	5.7	5.5	2.3	6.0
Hungary	15.8	18.1	3.2	-0.3	11.6	10.8	3.6	-2.2	5.9	6.0	3.1	5.8
Slovakia	4.9	5.9	3.7	-9.7	13.6	12.6	6.2	-7.6	6.6	5.9	3.0	2.0
Croatia	8.4	6.3	4.0	-2.2	5.9	9.1	4.9	-4.9	5.8	4.7	1.7	-1.4

Table 2. Per capita real export, import and income growth rates and average ratio of trade balance to GDP for fourteen countries over three periods. Source : author's calculations, data from Ameco. Starting dates of the time series as for Table 1. The numbers for Western and Eastern Europe are unweighted means of the seven countries in each group. The growth rates are geometric means of growth rates over the period, average trade balance to GDP is an arithmetic mean over the period.

There are quite clear differences in the dynamics of income, export and import growth across decades. In Eastern Europe, the first two decades show clearly unsustainable growth from a BOP perspective. GDP growth differed widely across countries in the first decade, with Bulgaria and Romania experiencing depression while Poland, Hungary and Slovakia showed vigorous growth, and trade dynamics were unsustainable nearly everywhere : imports grew faster than exports in every country except Romania and Croatia, and the former still experienced a significant and stable trade deficit throughout the period. In the run-up to the GFC, growth was spectacular and every country but one ran a trade deficit, with Bulgaria, Romania and Slovakia sporting particularly large ones. Imports still grew faster than exports on average, but some countries' trade deficits shrank. In 2009, most countries experienced a fall in exports, imports and income, with imports generally falling more than exports, but not enough for trade deficits to disappear. In the following decade, Eastern Europe's trade rebalanced : export growth slowed (it remains twice higher than in the West), but import and income growth slowed even more, with imports growing slower than exports in every country except Hungary (which runs a trade surplus for all of the period). It is thus income and imports that adjusted, leading to growth becoming BOP-sustainable. The overall dynamic is

coherent with Thirlwall's thesis : countries can outgrow their BOP-constraint for a while, but eventually income has to adjust in order for import growth to slow and the trade balance to improve.

The case of Romania merits a closer look as an exception to this rule. Though Table 2 shows a rebalancing of the country's trade balance, with exports outgrowing imports in 2009-2019, Figure 3 shows the country's income and import growth picking up from 2017 onwards and the country's trade deficit therefore widening again. The rebalancing thus seems to have been temporary. As previously discussed, the BOPCG equation overestimates the country's growth rate despite the country being in trade deficit for the whole period, which is counterintuitive. The country's average trade deficit over the three decades considered amounted to 6% of GDP. Given emigration from the country (its population decreased by 18% in thirty years), one could think imports were financed by remittances, but the country's NFIA was also negative throughout the period, bringing the average current account deficit to 7,7% of GDP. It thus seems that in the case of Romania, the BOP constraint was not binding for a reason that Thirlwall rejected : sustained capital inflows allowed for a persistent and quite high current account deficit.

Eastern Europe's convergence (or at least that of the countries considered, excepting Romania) over the period 1990-2019 is sustainable from the perspective of the BOP : as Table 1 shows, the countries grow below (or, in the case of Poland, just barely 0.3% a year above) their BOP-sustainable growth rate and, after a period of unsustainable import growth and trade deficits in 1990-2008, their income growth slow and trade rebalances. This finding differs from that of Lesko and Muchova (2020) who analyse the period 1995-2014 and find Central and Eastern Europe's convergence to be unsustainable. This difference may be due in part to the larger sample studied by the two authors, who include the Baltic countries and Slovenia, and the time period studied : as the Eastern countries' BOP improved in the 2010's, including more of that decade in the estimations yields more favourable results. This rebalancing lends support to Thirlwall's model and the claim that the balance of payments constraint is binding.

In the Western countries taken as a whole, BOP dynamics were sustainable throughout the period, with exports growing faster than imports and trade in surplus. In the first period, exports grew faster than imports for every country and the two economies with trade deficits moved towards closing them. In the second period, growth slowed down, as did exports and imports, and imbalances arose : in Italy and France, exports slowed down much more than imports, and the countries' trade surpluses vanished. As in Eastern Europe, in the West the GFC brought with it a fall in exports, income and imports. The fall in growth in 2009-2019 compared to the previous period was relatively smaller than between that period and the nineties, but still important.

Looking only at Table 2, one could get the impression that Italy's rebalancing in the post-crisis decade was driven by a rise in export growth : both export and import growth was higher than in the run-up to the GFC, but export growth rose more. That impression is driven by the omission of the fall in 2008-2009 from the figures in the table. As shown by Figure 3., Italy's imports peaked in 2007, had fallen by nearly a quarter by 2009, and had not recovered by 2019 to their pre-crisis level. While Italian exports fell even more in 2007-2009, they recovered more quickly, surpassing their pre-crisis peak in 2016. Italy's per capita income, meanwhile, fell by 11% between 2007 and 2014 and, like imports, had not regained its pre-crisis level by 2019.

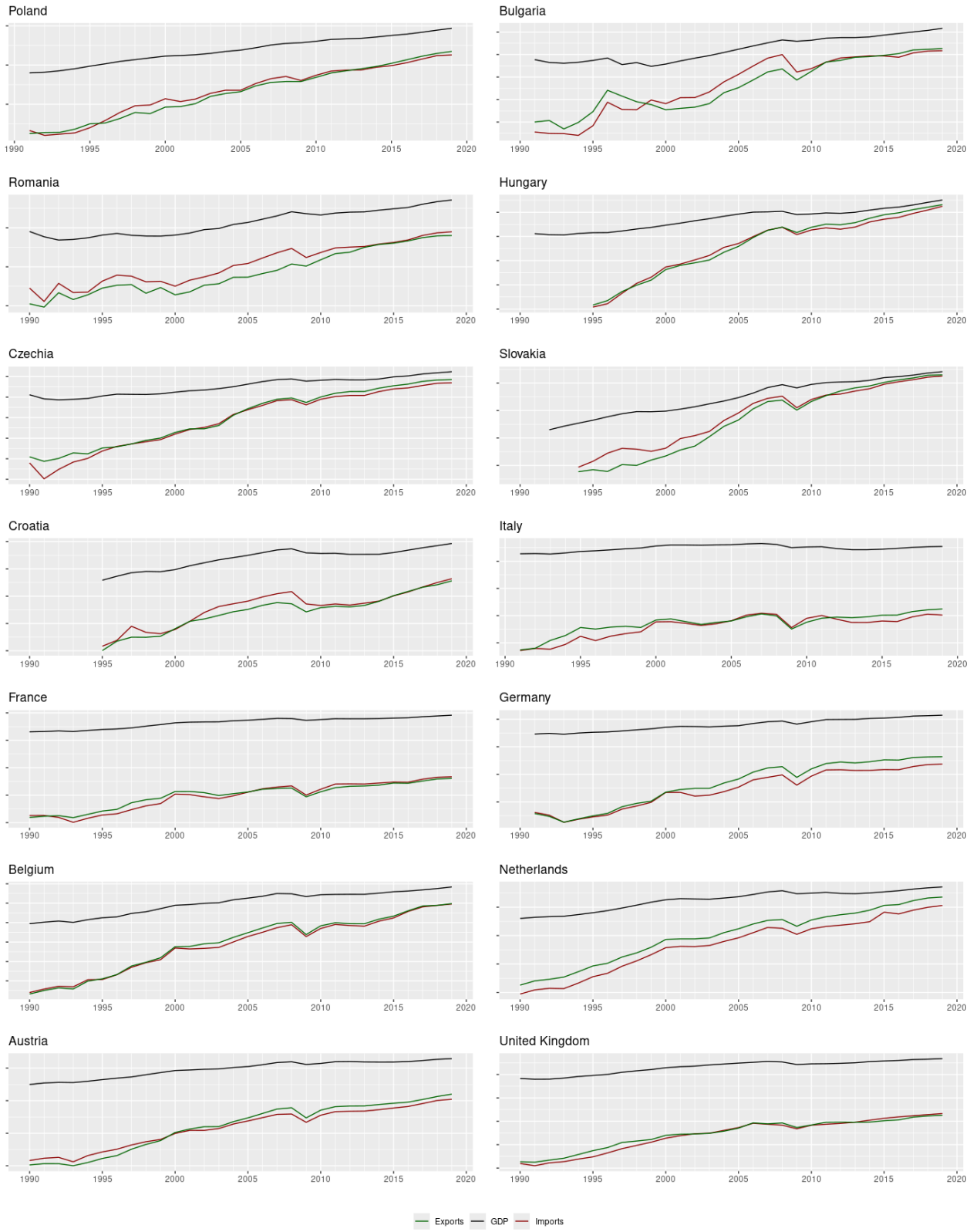


Fig. 3. Per capita real GDP, exports and imports (log scale) for fourteen countries

Source : Author's calculations, data from Ameco, same as Table 1.

Italy's BOP adjustment thus followed a very Thirlwallian pattern : it was a fall in income and imports, not export dynamism, that did away with the country's balance of payments deficit. This is not to argue that the trade deficit caused income to adjust : as discussed in section 2, one could take

two views on the direction of causality, either arguing that an expansion of credit caused demand to rise and imports to exceed exports or that the build-up in debt was due to the trade imbalance.

In France, no rebalancing took place in the post-GFC period : the country's (modest) trade deficit, started in 2007, persisted through the 2009 drop in trade, the subsequent rebound and the following decade. This would suggest unsustainable growth were it not for the country's foreign assets : the country's current account was in surplus throughout the period due to factor income inflows compensating for the trade deficit (NFIA averaged 1.19% of GDP in 2009-2019, against -1.06% for the trade balance, according to Ameco national accounts data). This points to the focus on the trade account rather than the current account as a limitation of the BOPCG model.

Two further countries saw their trade balance deteriorate in the post-crisis decade : Belgium and the United Kingdom. Both countries had a modest trade surplus in 2008-2009 and saw their import growth exceed their export growth in the following decade. Belgium's situation was similar to France's in that in retained a current account surplus thanks to its external assets and the corresponding income flows, while Britain saw, for most of the post-crisis period, a current account deficit (at an average of -1,5% of GDP) which suggests the need, at a certain point, for adjustment in income growth.

The general picture of growth and balance of payments dynamics over the period is thus coherent with Thirlwall's view of the trade balance as a binding constraint on income growth. First, the basic BOPCG equation is a good predictor of observed growth rates throughout the region, pointing to the importance of export growth and the income elasticity of imports for GDP growth. Second, in countries that experienced trade deficits, the rebalancing of trade happened through reductions in income growth (or, in the case of Italy, income *tout court*).

Describing the reduction in income and import growth in countries that were in deficit in the run-up to the GFC as rebalancing may be problematic: nearly all countries in the sample experienced a slowdown in import and income growth. This "rebalancing" may thus have less to do with the specific situations of the deficit countries than with the general regional macroeconomic slowdown, with a reduction in credit and fiscal consolidation after the financial crisis reducing demand growth and, coincidentally, bringing trade back towards equilibrium. The BOPCG model remains, however, a good predictor of growth performances as countries in general did not outgrow their balance of payments constraint.

3.3. Rebalancing and exchange rates

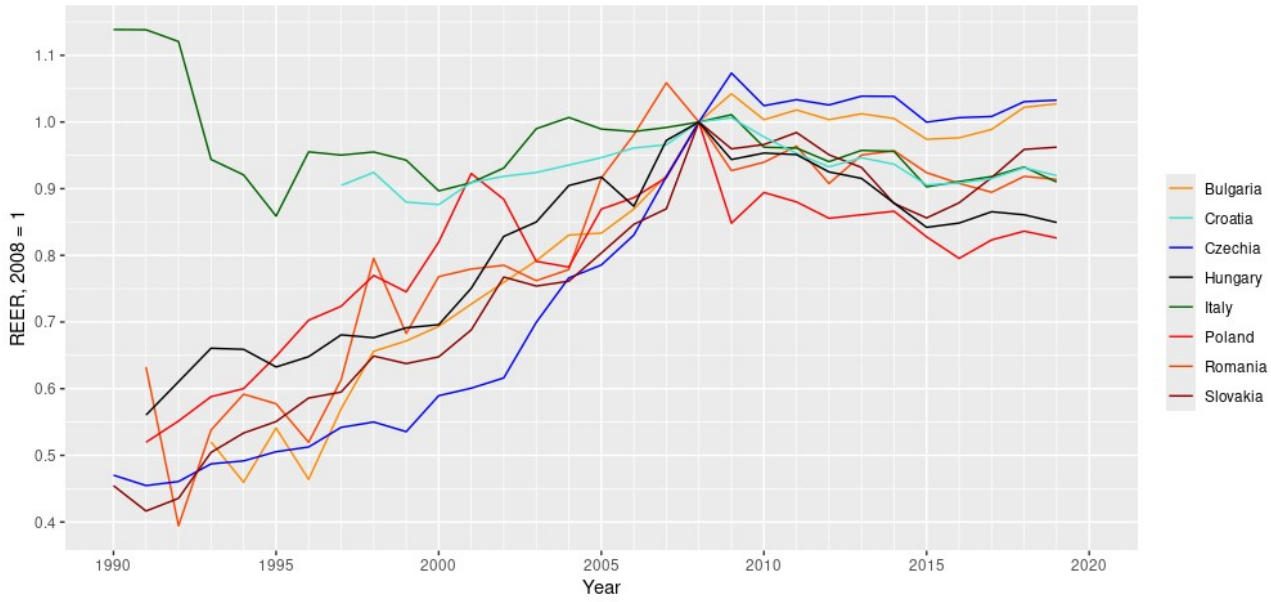
The description of the post-GFC dynamic in Eastern Europe and Italy as rebalancing through a reduction in income and import growth runs into a further issue. As we've seen, Thirlwall argues that it is income, not relative prices, that adjust to rebalance trade in the context of a deficit because "relative price changes or real exchange rate changes are not an efficient balance of payments adjustment mechanism either because the degree of long-run change is small, or the price elasticities of exports and imports are low" (Thirlwall, 2011, p. 32).

As Figure 4 shows, the rebalancing of Eastern European countries and Italy was accompanied by a drastic break from pre-GFC trends in real exchange rates. Eastern Europe experienced massive real appreciation in the 1990s and 2000s and either stable or falling (in Poland and Hungary) real

effective exchange rates from 2008 onwards. In Italy, the REER similarly depreciated after the GFC, returning to around its 2000 level. One could thus argue that the fall in import growth and rebalancing of Eastern European and Italian trade was driven by depreciation rather than slower income growth.

This is not convincing for several reasons : first, in the cases of EMU member states Italy and Slovakia as well as Bulgaria, whose currency was pegged to the Euro, depreciation can only happen through “internal devaluation”, that is either deflation or lower price growth than the rest of the Eurozone. The pressure on prices necessary for their growth to slow, in turn, is likely to come from a slowdown in activity, which the countries experienced after the GFC. Real depreciation is therefore not an alternative BOP adjustment mechanism to a slowdown or fall in demand but a corollary of it.

Fig. 4. Real effective exchange rates for eight countries



Source : IMF International Financial Statistics. REERs are deflated by CPI. Series start in 1991 for Poland, Hungary and Romania, 1993 for Bulgaria and 1997 for Croatia.

Similarly, in the economies with floating currencies, depreciation is not an alternative to a reduction in income but synonymous with it. In 2005, imported final or intermediate goods represented 25% of private consumption in Poland, 27% in Romania, 35% in Hungary and 39% in Czechia (Bussière et. al., 2013, Online Appendix). Given the rising shares of imports to GDP in all the Eastern countries, these numbers certainly underestimate the weight of foreign goods in consumption baskets later in the period. In such increasingly internationally integrated economies, the neoclassical view of trade balancing independently of income growth, purely through exchange rate adjustments, is quite implausible : depreciations represent a loss of real income and therefore take away from income growth.

3.4. Conclusion : convergence, divergence, the balance of payments and causality

The first notable result of this section is the fairly good fit of the BOPCG model in predicting countries’ growth rates over the period. The estimations point to the importance of both income

elasticities of demand for imports and export growth for convergence and divergence dynamics over the period. Eastern Europe's catch-up growth is thus a product of twice higher export growth, which by itself would yield twice higher GDP growth, and income elasticities of demand for imports a fifth lower than in the West, which together yield two and a half times higher predicted growth rates. Observed growth rates fit this ratio almost exactly. The dynamics of divergence are also affected by both factors : Germany and Italy thus have very similar income elasticities of demand for imports, but the former's higher export growth rate produced a BOP-sustainable income growth rate a third higher. Conversely, Austria's income elasticity of demand for imports was lower by a quarter than that of its northwestern neighbour, resulting in an estimated growth rate a third higher. In the next part of this paper, I focus on the determinants of export growth, seeking to explain one of these drivers of economic performance. Further research investigating factors influencing the income elasticity of demand for imports, such as the composition of imports, consumption patterns, dependence on imported capital goods or a country's energy mix, would shed light on another factor in countries' economic trajectories.

Overall, the fourteen countries in the sample grow at or below their BOP-sustainable rate. Regarding Eastern Europe, this finding contrasts with the results of Lesko and Muchova's 2020 paper investigating the question. This is likely because the recovery in Eastern countries' trade accounts happened in the 2010s, while the cut-off for Lesko and Muchova's data is 2014, diminishing the rebalancing's weight in the data. In Western Europe, the general picture is one of trade surpluses, with the exceptions of Belgium, France and the United Kingdom towards the end of the period and Italy in the run-up to the Global Financial Crisis. The first two countries in fact run a current account surplus owing to their international investment position and resulting income flows. This points to a limit of the BOPCG framework : its focus on the trade account does not allow it to factor in other components of the balance of payments. Great Britain's trade deficit only arises towards the end of the study's time frame and suggests the need for adjustment in income growth eventually, while Italy, together with the Eastern countries, offers the opportunity to examine how deficit countries' trade rebalanced.

The pattern of adjustment is coherent with Thirlwall's view that adjustment happens through a reduction in income or income growth, thus reducing imports or import growth and bringing the trade account back into balance. The evolutions of Italy and Eastern European countries bear out this hypothesis. Though the countries in question also saw either real depreciation or a break from the previous trend of appreciating relative prices, I argue the rebalancing fits the Thirlwallian picture of adjustment through income rather than real exchange rates. Three of the deficit countries considered have a fixed exchange rate with the Eurozone, their main trading partner, precluding adjustment through devaluation. Those countries can only adjust through "internal devaluation" which is a corollary to reducing income or income growth rather than an alternative to it. The remaining Eastern European countries are heavily internationally integrated, meaning that depreciation, either through the exchange rate or a fall in domestic price rises, is synonymous with an adjustment in income. Another factor that renders implausible the mechanism of trade balance adjustment through exchange rates is the absence, for many countries, of a straightforward relationship between exchange rates, exports and imports in most of the Eastern countries, discussed in the next part of the paper.

It is important, however, to stress that in describing the recovery of these countries' trade balances as coherent with Thirlwall's framework, I do not take a position on the causal mechanisms at work. Importantly, I cannot and do not purport to show that the decline in growth in deficit countries was *due* to their being deficit countries. Firstly, the decline in income growth responsible for the rebalancing of trade is not specific to the deficit countries but a region-wide phenomenon, likely resulting from the GFC and subsequent slowdown in credit, fiscal consolidation and low investment. Trade balances thus improve across the region (with some exceptions), not just in deficit countries. The most plausible causal story for Eastern Europe has capital flows, rather than trade imbalances themselves, as driving factors : as outlined by Tooze (2018, pp. 228-234), Eastern countries saw massive capital inflows from Western investors in the run-up to the financial crisis. This is a plausible driver of the very fast income growth during the period, the rise of real exchange rates and the region's large trade deficit. The sudden stop in inflows as Western banks restricted lending following the crisis likewise at least partly explains the decline in income growth and the stabilisation or decline in real exchange rates after the crisis. The change in the dynamics of inflation, wage growth and the trade balance that Kühnast (2022) frames as a change in growth strategy or "macroeconomic regime" from domestic demand-led to weakly export-led may thus be more appropriately understood as a reversal of the financial cycle which saw massive capital inflows into Eastern Europe. Exports, one should add, grew faster during the period of the "domestic demand-led" model than during the "export-led" period. This point illustrates the importance of looking at trade dynamics beyond the sign of the trade balance.

In the Italian case, an explanation for the deficit in the run-up to the GFC and EZ crises and the rebalancing in their aftermath likewise hinges on debt : the pre-crisis years saw expanding private debt, and the subsequent period harsh austerity and a collapse of lending (See Fig. A1 in the appendix).

Credit dynamics are thus a plausible explanation of balance of payments dynamics : the external balance is endogenous to financial cycles, its deterioration and subsequent recovery symptoms rather than drivers of trends in income. This interpretation, based on stylized facts taken from the literature, is plausible in view of the dynamics of the variables examined, but a thorough assessment of it would require a much more detailed look at the macroeconomic picture of each country in the sample.

Returning to the hypotheses C1-C4, explored in section 2, this analysis allows the following observations : the relationship between export and income growth, expressed in the BOPCG estimates in Table 1, points to the importance of export growth for countries' growth performance. I can point to this relationship but not comment on the causal channel through which exports drive or allow income growth (C1-C2). As for C3 and C4, the discussion of credit and deficits above and the general picture of a binding BOP constraint in the long run is coherent with these hypotheses : economies tend to gravitate to a growth path coherent with equilibrium in the trade account as agents do not generally spend more than they earn, but they can temporarily deviate from it given extraordinary credit conditions. A debt crisis such as that suffered in Italy during the EZ crisis or Eastern Europe during the GFC then brings adjustment through restrictions in credit or, in the Italian case, politically imposed austerity.

One last observation can serve as a link to political-economic considerations : the economies examined, on average, grew *below* their BOP-sustainable growth rates. Western Europe, in particular, sported important trade surpluses throughout the period, pointing according to the BOPCG framework to unexploited growth potential. This dynamic only strengthened over time : as Table 2 shows, the average (still unweighted) trade surplus in the seven Western countries went from 1,4% of GDP in the 1990s to 2,4 and 2,9% in the run-up to and aftermath of the GFC. This can be linked to the arguments of Gennaro Zezza (2020) and Jan Kregel (2023) that the EU's Maastricht rules constraining fiscal policy force countries into pursuing trade surpluses. I return to this argument in the concluding part of this paper, while discussing the implications of my findings.

4. Why did countries converge or diverge ? Specialisation and competitiveness

In part two of this paper, I reviewed different explanations of export growth differentials between countries, discussing the role of specialisation, income elasticities of demand for different types of products and measures of price and non-price competitiveness. In this section, I apply these concepts and measures to analyse the export performances of the fourteen countries in my sample. I start by discussing income elasticities of demand for exports and specialisation before moving on to a market-share indicator of competitiveness, analysing the relationship between relative prices and export growth through Standard Export Equations and graphs, and concluding with proxy-based measures of NPC. I argue that despite Eastern Europe performing well on many indicators taken to be measures of NPC, its convergence is best accounted for by price-competitiveness, while divergence within Eastern and Western Europe can be partially accounted for by non-price factors.

4.1. Income elasticities, export destinations and specialisation

As explored in section 2.4, authors such as Raúl Prebisch and Nicholas Kaldor see income elasticities of demand for exports as vital for countries' growth prospects. For the former, the income elasticities of demand for imports and exports matter because they determine the ratio of growth rates compatible with equilibrium on the balance of payments, as in equation (5).

(5) $y/y_f = \Omega/\pi$

For Kaldor, more straightforwardly, the income elasticity of demand for a country's exports drives output by determining how much output expands for a given level of growth in foreign income. For both authors, higher income elasticities of demand are associated with industrial goods, which offer greater potential for productivity growth through technical progress. As I argue above, income elasticities cannot be taken, as some authors do, as a measure of non-price competitiveness : what they indicate is competitiveness of some kind, price or non-price. In this section, I analyse the differences in export growth among my fourteen countries in terms of income elasticities of demand, the growth in foreign demand and foreign imports, and sectoral specialisation.

Table 3 shows income elasticities of demand for exports and foreign import demand income elasticities of exports, as well as the growth, over the whole period, of foreign income, foreign imports and exports.

The income elasticity of demand and imports elasticity of demands for the exports of Eastern countries are respectively almost a third and almost two thirds higher than the corresponding coefficients for Western countries. What this table shows is superior competitiveness of some kind on the part of Eastern Europe : for an equal amount of foreign income and foreign import growth, Eastern exports progressed respectively a third and two thirds more than Western ones. The second column shows that Western countries, on average, lost market share in the imports of their trading partners, while Eastern countries gained it.

Due to the limited availability of exports data, the period considered is slightly shorter for most of the Eastern countries. The table thus understates the difference in growth rates, as the lower (on average) export growth of Western countries happened over a longer period and would thus be proportionately slower were it on a yearly basis. Similarly, foreign imports in fact grew faster year by year in Eastern than in Western countries, contributing to the former's fast export growth. Compared to their Western counterparts, Eastern countries exported less to extra-European nations and more to other Eastern-European countries : European trade integration benefited Eastern Europe by adding to its export growth. The main factor of the East's export performance was still, however, its competitiveness.

The table also highlights the pertinence of examining not just foreign income growth but foreign import growth. Eastern Europe saw less foreign income growth (over the shorter period for which export data is available) but similar foreign import growth as Western Europe. Foreign income elasticities of demand for imports thus matter for countries' export growth. One might, however, argue that importing countries' income elasticities of demand for imports are endogenous to exporting countries' competitiveness : we would expect more competitive exporters to compete with domestic firms in importing countries, which would result in more import growth for trade for a given level of income growth. The ratio of foreign import growth to foreign income growth (column 4/column 3), higher by a third for Eastern European countries, could thus be due to characteristics of economies' trade partners (political choices, domestic production structures, consumption patterns etc.) or to the competitiveness of Eastern Europe. Since the latter is only responsible for a small part of Western Europe's imports (3% in 1990, 13% in 2019, according to Harvard Atlas of Economic Complexity Data), the first explanation is more convincing.

Where countries exported affected divergences within groups : the growth of foreign imports was thus 369% for Slovakia but only 124% for Croatia. There was much less variation in the West : foreign demand grew by 285% for the UK but only 220% for the Netherlands, a difference of about a quarter. In Eastern Europe, slower export growth was associated with a greater share of exports going to southern Europe and Western Asia, while faster growth was associated with more exports to Northern and Western Europe. There thus seems to be a geographical factor at play : southern countries were less associated with Europe's rich core and north. In the West, on the contrary, trade linkages with the EU core and north seem to have been a disadvantage : the Netherlands and Belgium, more focused on these regions, benefited from less foreign import demand than France and the UK, who exported more to the United States of America and South-East Asia. One should note that the data on export shares concerns only trade in goods, thus omitting the benefits to these countries of their tourism and financial services sectors (Harvard Atlas of Economic Complexity).

	Income elasticity of demand for exports (1)	Import demand elasticity of demand for exports (2)	Foreign income growth (3)	Foreign import growth (4)	Export growth (5)
Eastern Europe	**2.80**	**1.61**	**68%**	**244%**	**586%**
Poland	5.51	1.91	67%	270%	869%
Czechia	3.72	1.65	87%	309%	630%
Slovakia	2.28	1.45	143%	369%	604%
Hungary	3.07	2.16	66%	259%	1049%
Bulgaria	-0.47	0.86	31%	169%	171%
Romania	3.41	2.00	57%	207%	564%
Croatia	2.09	1.22	27%	124%	216%
Western Europe	**2.16**	**0.97**	**82%**	**244%**	**237%**
Italy	1.39	0.67	79%	240%	144%
France	2.04	0.93	95%	257%	234%
Germany	2.16	1.19	88%	237%	319%
Belgium	2.24	0.91	73%	234%	196%
Netherlands	3.22	1.17	64%	220%	299%
Austria	2.35	1.06	77%	237%	249%
United Kingdom	1.71	0.86	99%	285%	218%

Table 3. Income and import demand elasticities of demand for exports, foreign income, foreign import and export growth for fourteen countries, 1990-2019. Source : author's computations, data from OECD for GDP, exports and imports, all in constant PPP adjusted 2015 USD. Harvard Atlas of Economic Complexity for export shares. Elasticities correspond to the coefficients of log-log regressions of exports on, respectively, foreign GDP and foreign imports. Foreign income and imports are weighted by the shares of each country in the exports of the exporting country, computed on an annual basis. A limit of these measures is that the countries for which import and income data are available are not the totality of trading partners of the fourteen countries studied. The countries included in the variables represent an overwhelming majority of the export destinations of my fourteen countries : over 90% of exports in most cases, over 80% in the others. I thus consider the variables to be representative of the evolution of income and imports among the trading partners of my countries. The foreign income, foreign import and exports variables start in 1990 for all Western countries and Poland, 1991 for Hungary, 1993 for Czechia and Slovakia, 1995 for Bulgaria, Croatia and Romania.

What seems to have mattered more in countries' divergence, however, is elasticities of demand : Poland and Hungary's exports thus grew much more than those of Czechia and Slovakia despite lower foreign demand growth, while what set apart Italy, by far the worst performer in terms of export growth, was its low income (and foreign imports) elasticity of demand for exports. Low

elasticities also negated some of the advantage France and the UK derived from high foreign demand growth, resulting in below average export growth.

As we've seen, income elasticities of demand are taken by some authors as a measure of non-price competitiveness due to specialisation in favourable sectors. A cursory comparison of the composition of exports, using Harvard's Atlas of Economic Complexity database, shows this to be a potential explanation of divergence within Eastern and Western Europe, but not the former's convergence towards the latter. Poland, Czechia, Hungary and Romania, the countries with the highest income and import elasticities of demand for exports, thus export more machinery and vehicles and, in Romania's case, Information and Communication Technology (ICT), which are generally seen as high value added service sectors (Blecker and Setterfield, 2019, p. 381), than the East's worst performers, Croatia and Bulgaria. In the West, the picture is not clear: Germany thus exports a higher proportion of machinery and vehicles than Italy, but Italy exports more than Austria and the Netherlands, much better performers in terms of elasticities. The countries with higher elasticities export more ICT than Italy, but the difference is quite small.

The sectoral composition of exports also seems to be a poor explanation of Eastern Europe's superior export performance. Czechia, Slovakia and Hungary thus exported a slightly higher proportion of machinery and vehicles than Germany and any Western country, but this seems like an insufficient explanation of the countries' higher elasticities and much higher export growth : their exports grew between two and three times quicker than those of the *Exportweltmeister*. Poland's and Slovakia's elasticities and especially export growth were likewise much higher, despite a proportion of machinery and vehicles on par with that of Italy (and a barely higher fraction of ICT).

	Poland	Italy
Electric machinery	1559%	84%
General industrial machinery	1067%	179%
Specialised industrial machinery	328%	55%
Metalworking machinery	192%	53%
Office and IT equipment	6350%	-56%
Other transport	1392%	84%
Power generating machinery	1469%	265%
Road vehicles	3375%	99%
Telecommunications and sound equipment	2350%	68%

Table 4. Per capita growth of real exports by sub-sector of the machinery and vehicles sector for Poland and Italy, 1990-2019. Data from Harvard Atlas of Economic Complexity, IMF International Financial Statistics, Ameco. Export data originally in current USD, converted into national currency using IMF exchange rates, deflated using GDP deflator from Ameco and divided by population from Ameco.

Breaking down the machinery and vehicles sector, as Table 4. does, further illustrates the limits of an explanation in terms of specialisation : every sub-sector grew much more in Poland than Italy. The differences in export growth between Eastern and Western Europe simply cannot be explained

by the former's specialisation in faster growing industries. One must conclude that Eastern countries were simply much more competitive than their Western peers.

An examination of income and import elasticities of demand, the geography of European countries' exports and sectoral specialisation yields some partial explanations of export performances, but points to yet unexplained differences in competitiveness. Both the higher growth of Eastern European exports and some of the divergence within Eastern and Western Europe has to do with where countries exported : some countries within both groups, and Eastern Europe compared to its Western neighbours, thus benefited from exporting to economies with higher import growth. Income elasticities of demand and the competitiveness they measure, however, remain fundamental. Differences in these elasticities among Eastern countries can in part be accounted for by distinct sectoral specialisations, with better performing countries' focused in greater proportion on industrial machinery and vehicles. In contrast, specialisation appears to be a poor explanation for the East's much higher export growth and divergences within Western Europe. Shedding light on these factors thus requires a deeper examination of countries' competitiveness, to which I now turn.

4.2. The market-share indicator of competitiveness and relative prices

As discussed in part 2, measures of non-price competitiveness can be divided into two categories : residual and proxy-based. In this section, I discuss the MS indicator used by Keil (2024a) as a residual-based measure of NPC.

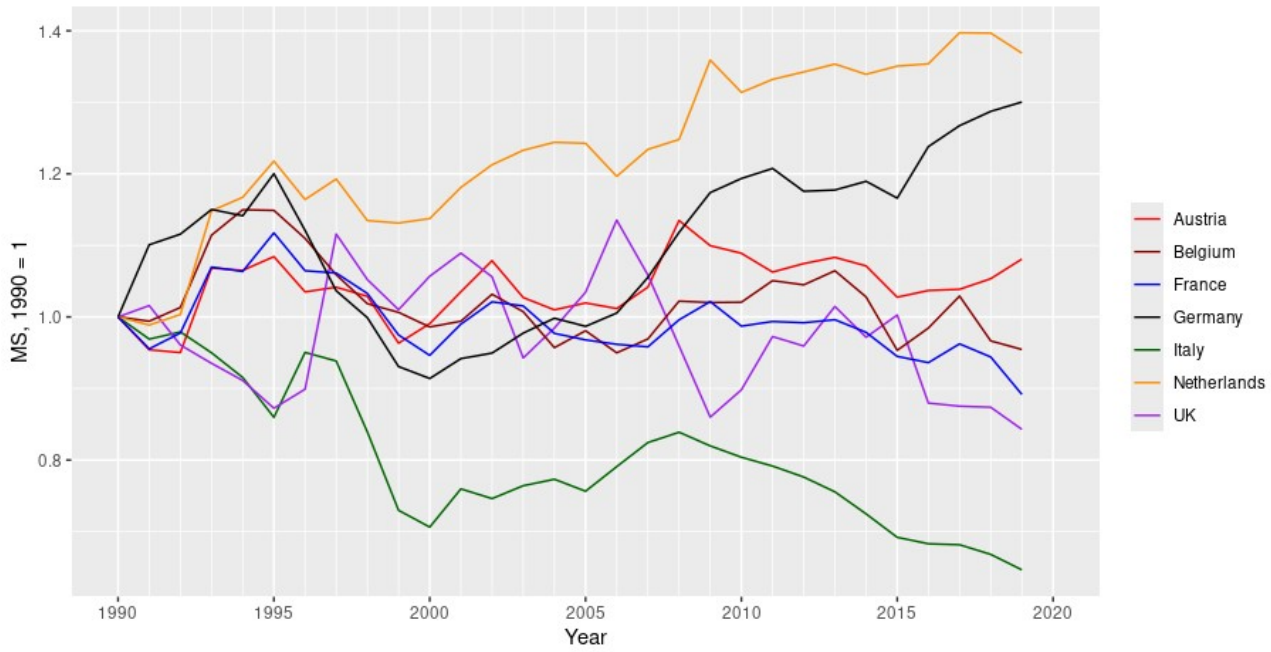
For reasons developed in part 2, Keil's NPC indicator, originally proposed by Xifré (2021), is best conceived of as an indicator of competitiveness of some, not necessarily non-price, kind. It measures changes in market share not accounted for by changes in relative prices. I therefore refer to it as the MS indicator :

(10) $MS = (XS*REER^{P})^{1/P}$ with $XS = X/FD$

As outlined above, the MS indicator is problematic in that it assumes price elasticities demand for exports that are homogeneous across countries and equal unity, both questionable assumptions.

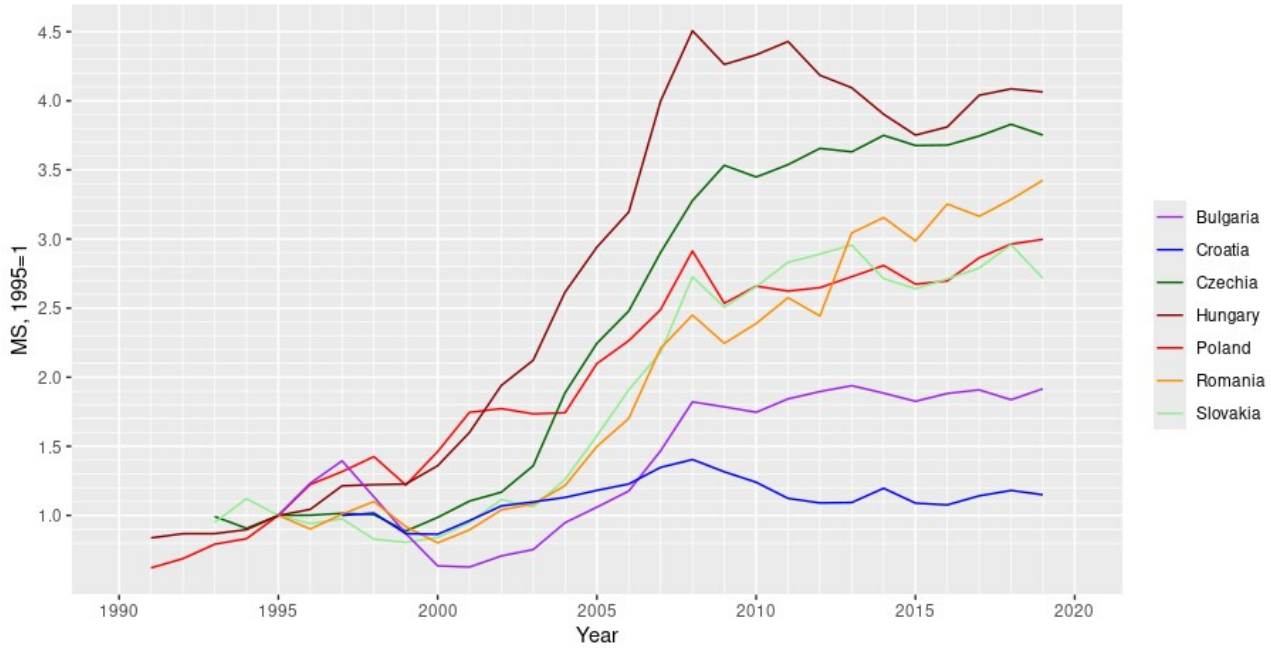
Figures 5.1 and 5.2 show the evolution of the MS indicators for the seven Western European and Eastern European countries. For Western Europe, the superior performance of the Netherlands, Germany and Austria fits with their having the highest foreign import elasticities of export demand. This is to be expected: these elasticities (column 2 of Table 3) are a rough measure of the variation in market share. Coherently with data on export growth and elasticities, Italy stands out as the worst performer in terms of the MS indicator. Figure 5.1. thus tells the same story as the elasticities explored above. The same goes for Figure 5.2. and the Eastern European picture : Bulgaria and Croatia stand out as the worst performers, which fits with their low elasticities and export growth as well as with their specialisation in less favourable sectors. Hungary does best, which is coherent with its astronomical export growth. Interestingly, Czechia, which had export growth comparable with Romania and Slovakia, does better on the MS indicator than Poland, which had higher export growth and a higher elasticity of exports in relation to foreign imports.

Figure 5.1. Market share indicator, Western European Countries



Source : Author's calculations. Export and import data from the OECD as for Table 3, export destinations from Harvard Atlas of Economic Complexity, REER data from the IMF International Financial Statistics Database.

Figure 5.2. Market share indicator, Eastern European Countries

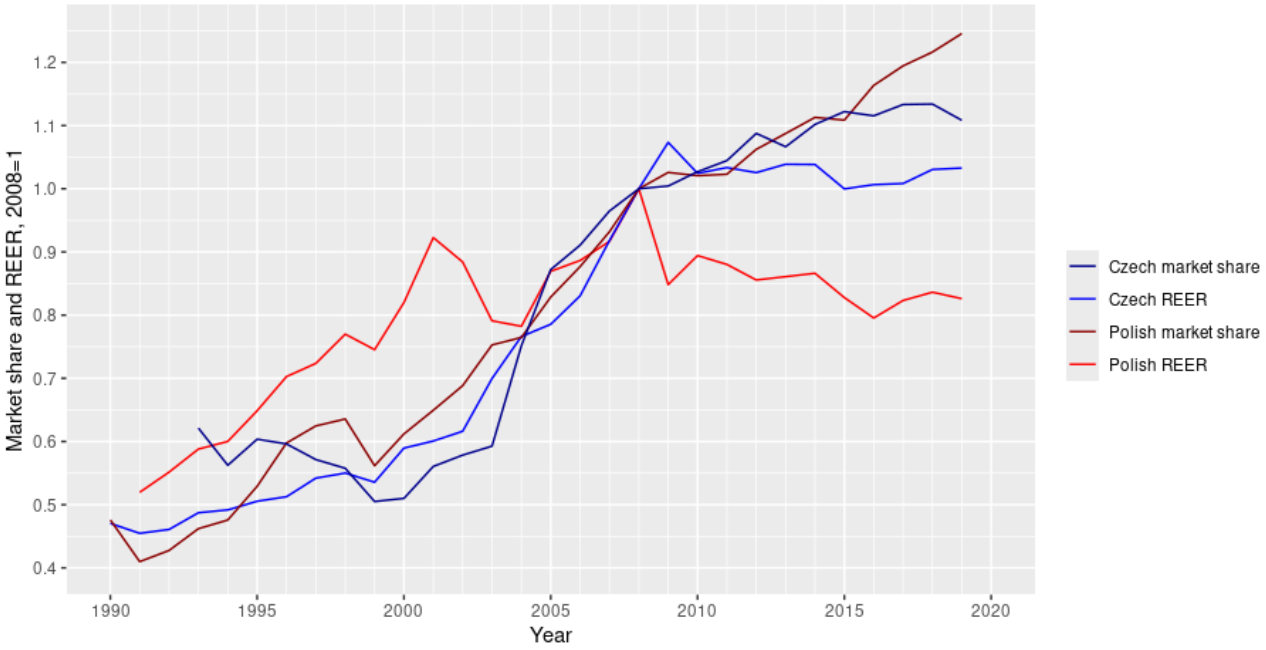


Source : Author's calculations. Data from OECD, Harvard Atlas of Economic Complexity, IMF International Financial Statistics, as for figure 5.1. Time series for exports start in 1990 for Poland, 1991 for Hungary, 1993 for Czechia and Slovakia, 1995 for Bulgaria, Croatia and Romania. REER are deflated by CPI, time series start in 1990 for Czechia and Slovakia, 1991 for Poland, Hungary and Romania, 1993 for Bulgaria and 1997 for Croatia.

This result points to a limit of this measure : the loss of information due to the indicator being affected by variations in market share and in relative prices. Czechia's higher MS score relative to Poland is thus due to differences in trends in REER : as Figure 6.1. shows, in 2008-2019, Poland

saw a real depreciation of about a fifth while Czech relative prices appreciated slightly. This might be interpreted as the indicator working as intended : it measures *non-depreciation-induced* variations in market share. Because we do not know, however, that the assumed price elasticities are actually operating, the higher indicator might not correspond to higher non-price competitiveness.

Figure 6.1. Market share and real exchange rate change, Poland and Czechia



Source : Author's calculations. Data from OECD, Harvard Atlas of Economic Complexity, IMF International Financial Statistics, as for Figure 5.2.

The relationship between competitiveness and relative prices is not obvious. One could certainly claim that Polish depreciation at the start of the period drove its rising market share throughout the rest of the decade, as investors enticed by lower costs set up exporting firms or lower costs allowed more competitive prices. Then again, the massive appreciation of the previous period, which saw Poland's relative prices nearly double between 1991 to 2008, did not prevent its market share from rising by 110%. Czechia's market share likewise grew much faster in the run-up to the GFC, alongside massive appreciation, than after 2008. It is therefore more plausible that capital inflows and quickly rising income caused the appreciation in the two countries and that their exports were not negatively affected by it. If this explanation holds and the two Countries' exports are not sensitive to relative price changes, then the MS indicator does not measure non-depreciation induced changes in market share : it is a measure of market share polluted by variations in relative which may or may not actually affect countries' export performance.

The trends shown by Figure 5.2 further illustrate this point : in the run-up to the GFC, the MS indicator rises steeply for all Eastern countries with the exception of Croatia, and then flattens out or declines slightly until 2019. Given the construction of the MS indicator, this could correspond to a decline in relative prices, market share, or both.

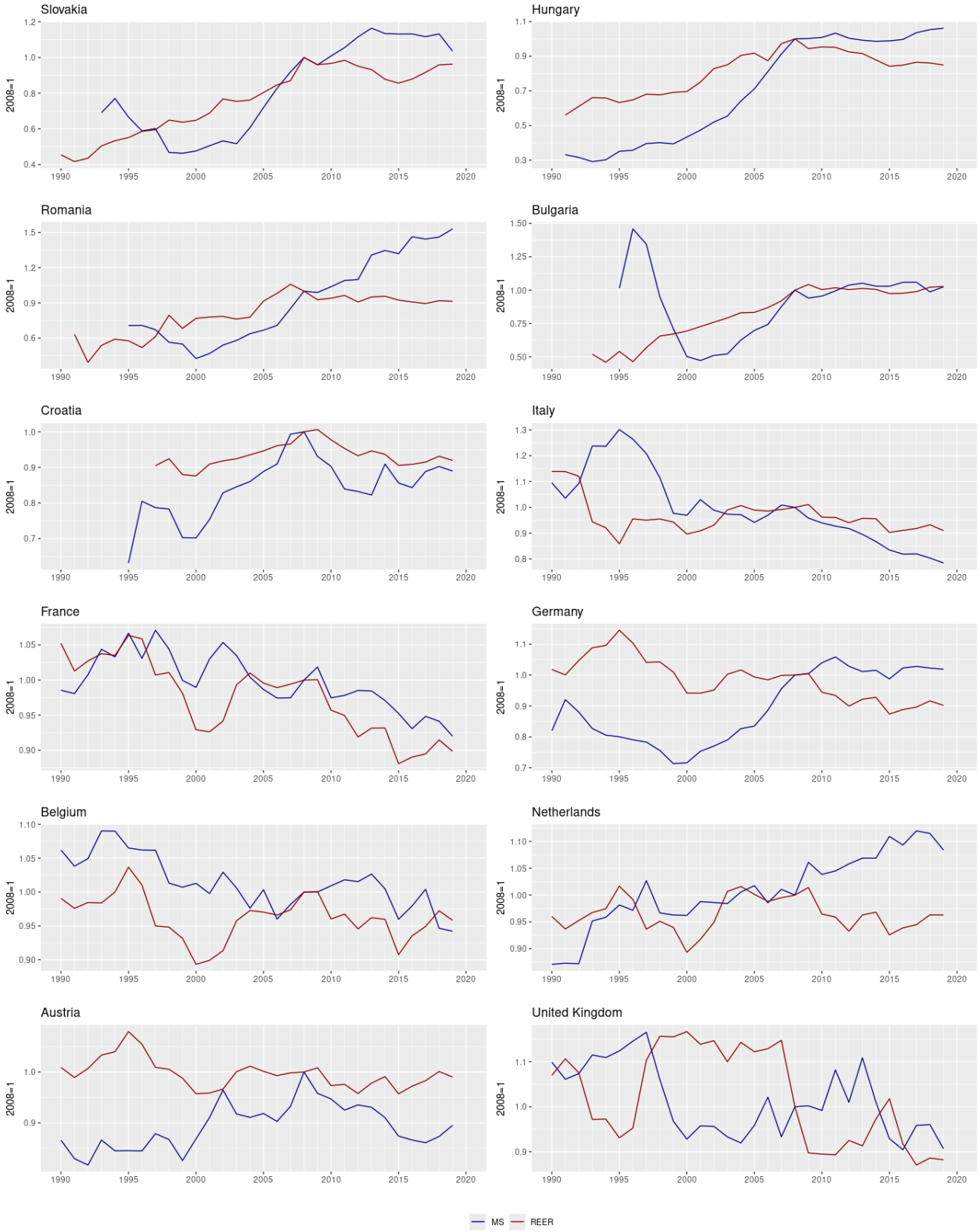


Fig. 6.2. Export market share and REER for twelve countries

Source : Author's calculations. Data from OECD, Harvard Atlas of Economic Complexity, IMF International Financial Statistics, as for Figures 5.1 and 5.2.

It is therefore more informative to decompose the indicator into its constituent parts, as in fig. 6.2, which reveals different post-GFC national situations : depreciation and a loss of market share in

Croatia, depreciation and rising market share in Slovakia and Romania, depreciation and Stagnant market share in Hungary, and stagnation of both relative prices and market share in Bulgaria. In the previous period, all these countries had experienced a rising market share and appreciation.

The break in 2008 in the MS indicator thus reflects a change in the dynamics of both real exchange rate and market share : Eastern countries' relative prices stopped rising, and in some cases declined slightly, while their market shares stabilised, rose more slowly or declined slightly. Eastern Europe thus saw a break in its competitiveness. The stabilisation of relative prices may have counteracted this somewhat, but the relationship between prices and market share is unclear and more coherent with an explanation in terms of capital inflows : investment flowed into Eastern Europe in the run-up to the GFC, driving growth and inflation, and stopped or slowed afterwards, leading to stabilisation of relative prices and rebalancing of trade. A stoppage of capital flows as the Western financial system reeled from the crisis could also partially explain the break in competitiveness : absent Western FDI, Eastern exports fared worse. It is also a possibility that the pre-GFC period of real appreciation, leaving it with a higher level of relative prices, made Eastern Europe a less enticing destination for FDI.

In Western Europe, the picture painted by the variations in market share and real exchange rates is much more chaotic : for two countries, Italy until 2008 and the UK throughout the period, there seems to be a clear relationship between relative prices and market share. In France in the 2000s, Germany in 1999-2008, Austria in 1999-2009 and the Netherlands after 2009, there also seems to be a negative relationship, but there is no clear pattern over a longer period. Overall, what stands out is the overperformance of Germany and the Netherlands and the general post-crisis tendency towards depreciation that seems to do little good for the deteriorating competitive position of most countries.

Analysis using the MS indicator and its components, real exchange rates and market shares, leads to five conclusions. First, there is no clear relationship, across countries and time periods, between relative prices and export market share. Second, given this lack of relationship, using the indicator is less instructive than examining its components separately. Third, and unsurprisingly, the competitiveness and within-group divergence dynamics shown by market shares and the indicator are similar to the results of examining elasticities of demand for exports relative to foreign imports : Germany, the Netherlands and Austria stand out as the most competitive in the West, while Croatia and Bulgaria are the clear underperformers in the East. Fourth, trends change after the GFC. From that point on, in Eastern Europe there was depreciation or stability in relative prices and stable or slowly growing market shares. In the West, there was a general tendency towards depreciation and declining competitiveness in most countries. Finally, there was a clear convergence trend : market shares rose for all Eastern countries until the GFC, and mostly kept rising, though at a slower rate, after the crisis.

The analysis remains, however, mostly descriptive : though I have noted an apparent relationship between prices and market shares in two cases, which could partly explain the performance of Italian and British exports, the examination of the variables considered in this section indicates rather than explains differences in competitiveness. Another look at the role of relative prices, through estimations of Standard Export Equations, will permit more discussion of this relationship.

4.3. Standard export equations, foreign demand and relative prices

The dreadful Table 5 shows the results of estimating the SEEs for the fourteen countries in the sample, using two variables as the demand variable : foreign income and foreign imports, weighted as described below table 3 when discussing elasticities of demand.

Dependent Variable : Export growth rate								
Country	Demand variable	Constant	REER coefficient	Demand coefficient	R^2	Demand change	REER change	Export growth
Poland	Income	6.34 (1.19)	0.52*** (0.16)	0.86** (0.35)	0.38	1.63	1.87	8.69
	Imports	5.00 (1.09)	0.35** (0.13)	0.69*** (0.16)	0.56	4.43		
Czechia	Income	5.02 (2.36)	0.54 (0.36)	0.62 (0.43)	0.12	2.50	3.03	8.21
	Imports	3.25 (2.23)	0.48 (0.31)	0.61** (0.23)	0.26	5.74		
Slovakia	Income	7.56 (2.17)	0.06 (0.36)	0.10 (0.21)	0.01	3.78	2.62	8.12
	Imports	6.69 (2.33)	0.04 (0.35)	0.22 (0.20)	0.04	6.43		
Hungary	Income	8.25 (2.14)	0.08 (0.41)	0.58 (0.37)	0.09	1.92	1.33	9.80
	Imports	3.60 (1.80)	0.21 (0.29)	1.15*** (0.22)	0.53	4.76		
Romania	Income	8.91 (2.04)	-0.09 (0.20)	-0.07 (0.43)	0.01	2.00	2.35	8.57
	Imports	8.85 (2.60)	-0.09 (0.22)	-0.01 (0.42)	0.01	4.90		
Bulgaria	Income	6.96 (2.30)	-0.35 (0.35)	-0.75** (0.33)	0.31	1.37	2.91	4.91
	Imports	8.32 (2.67)	-0.41 (0.38)	-0.50 (0.35)	0.21	4.46		
Croatia	Income	3.95 (1.28)	0.38 (0.72)	0.30 (0.23)	0.09	1.37	0.10	4.48
	Imports	1.69 (1.22)	0.98* (0.55)	0.68*** (0.18)	0.42	3.94		
Italy	Income	2.08 (1.09)	-0.50** (0.23)	0.42 (0.25)	0.29	2.12	-0.67	3.61
	Imports	0.19 (0.95)	-0.52*** (0.17)	0.62*** (0.13)	0.57	4.48		
France	Income	2.93 (0.88)	-0.26 (0.36)	0.53** (0.25)	0.3	2.40	-0.51	4.63
	Imports	1.01 (0.55)	-0.07 (0.18)	0.71*** (0.09)	0.78	4.63		
Germany	Income	4.81 (1.14)	-0.85** (0.36)	0.05 (0.26)	0.24	2.29	-0.37	5.60
	Imports	2.13 (0.97)	-0.29 (0.27)	0.67*** (0.15)	0.57	4.44		
Belgium	Income	3.05 (0.89)	-0.27 (0.32)	0.43 (0.26)	0.18	1.95	-0.08	4.24
	Imports	0.78 (0.60)	-0.09 (0.18)	0.72*** (0.09)	0.71	4.36		
Netherlands	Income	4.23 (0.71)	-0.56** (0.23)	0.43** (0.20)	0.36	1.78	0.05	5.22
	Imports	2.58 (0.54)	-0.32* (0.15)	0.57*** (0.08)	0.73	4.23		
Austria	Income	3.40 (0.95)	-0.81* (0.41)	0.53** (0.24)	0.31	2.04	-0.04	4.96
	Imports	1.53 (0.79)	-0.38 (0.31)	0.67*** (0.12)	0.64	4.43		
United Kingdom	Income	4.73 (0.86)	0.29* (0.15)	-0.16 (0.12)	0.15	2.62	-0.50	4.10
	Imports	2.85 (1.14)	0.07 (0.17)	0.27* (0.16)	0.19	4.93		
Note :	* p<0.1, ** p<0.05, *** p<0.01							

Table 5. Results of estimating standard export equations for fourteen countries and average growth rates of foreign demand, real exchange rate and exports. Source : Author's calculations, OECD, Harvard Atlas of Economic Complexity, IMF International Financial Statistics, data availability as for Figures 5.1 and 5.2. Growth rates of exports, demand variables and REERs are

arithmetic averages of growth rates over the period. Foreign import and income variables are the same as for Table 3. SEEs are regressions of export growth rates on growth rates of the REERs and of the demand variables. Regressions using up to three lags of the independent variables yielded similar coefficients. All the time series for exports, foreign imports, foreign demand and REERs were found to have a unit root using the Augmented Dickey-Fuller Test with the R package *urca*. The rates of change of the variables were all found to be stationary, except for polish export growth. Because of data availability and the use of annual data, all the regressions were done on quite short time series, with degrees of freedom ranging from 19 for Croatia to 26 for all Western countries, with the other Eastern countries falling between 21 and 25.

The first notable finding is the apparent lack of sensitivity to relative price changes of Eastern European exports. The REER coefficients are generally positive and have larger standard errors, in some cases they are even positive and statistically significant. No REER coefficient for an Eastern country is negative and statistically significant. Higher export growth, over the period, tended to be associated with appreciation. This indicates a certain degree of competitiveness, either of the price or non-price variety : Eastern exports were competitive enough that rising relative prices did not lead to lower export growth. In Western European countries (excluding the UK), all REER coefficients are negative, meaning appreciation was always associated with slower export growth. This association was not strong everywhere : for France and Belgium, the standard errors are quite large, while for Austria and Germany, the price effect was only significant in the specification that uses foreign income as the demand variable. These results indicate lower competitiveness on the part of Western Europe : its producers could mostly not afford to raise prices without harming growth. The UK presents an exception to this picture : its REER coefficients are positive, and even significant in the specification using foreign income as the demand variable. I return to the peculiar regression results for the UK, as well as the case of Bulgaria, below.

For both groups of countries, the coefficients associated with foreign income are generally lower than those associated with foreign imports, and often less significant. They are positive in all cases but those of Bulgaria, Romania and the UK, but are often small and/or have large standard errors. They are thus generally a poor predictor of exports. Foreign imports fare better, being positive and statistically significant in every Western country and four Eastern ones. They are similar in magnitude in these eleven countries, estimating an effect of around 0.6-0.7% of additional export growth for 1% more foreign import growth, except in Hungary, where the effect is higher, and the UK, where it is lower. The exceptions are Bulgaria, to which I return below, as well as Slovakia and Romania, whose high export growth seems impervious to variations in foreign income, foreign imports and relative prices.

The observation about Slovakia and Romania applies more broadly to Eastern Europe. Standard errors of the coefficients are higher and the average R^2 for its equations, using respectively foreign income and foreign imports as the demand variable, are 0.14 and 0.29, compared to 0.26 and 0.60 for Western countries : the variations in Eastern countries' export growth are not very well explained by changes in either relative prices or foreign income. The East's higher export growth, reflected by higher constants, is thus apparently less dependent on foreign demand and stable or depreciating real exchange rates. The constants, corresponding to an estimated "base" rate of export growth in the absence of growth in foreign imports or income or REER change, are in fact likely underestimated : an implausible positive effect on growth is attributed to the real appreciation Eastern countries experienced. This lack of vulnerability of Eastern exports to appreciation and

foreign demand conditions can be seen as a sign of competitiveness : Eastern countries' exports grew fast no matter the external conditions.

Within country groups, sensitivity to changes in relative prices and foreign demand seems to bear no relation to export growth. There are both good and bad performers whose exports are insensitive to appreciation (the UK, Croatia, Poland, Hungary) and sensitive to it (the Netherlands, Italy, Germany). The coefficients and standard errors of foreign demand variables likewise do not distinguish between more or less competitive countries.

The regression results of two countries, the UK and Bulgaria, stand out as strange, presenting respectively positive coefficients for relative prices and negative coefficients for foreign income[2]. In the UK case, the negative coefficient for foreign income (with quite large standard errors) is likely due to a few spells of faster than average export growth and stagnant foreign income in 1993-96 and 2003-06, and a spell of stagnant exports and booming foreign income in 2013-2015. The positive coefficient associated with relative prices is likewise probably an artefact of episodes in 96-98 and 2007-2009 : outsides of these short periods, there seems to be no pattern of prices and exports moving together. In Bulgaria, the negative relation between the demand variables and exports is a product of the years 1997-2008, during which these variables moved in opposite ways, first as a fall in exports was accompanied by a rise in foreign income and imports, then as exports picked up while imports flattened out and foreign income fell. The fall of the foreign income variable by a third between 2003 and 2008 was driven entirely by a shift in Bulgarian exports from large Western European economies to dynamic, but smaller Eastern ones, registering as a fall in foreign income.

These examples show the potential pitfalls in using estimations of export equations – with short time series, admittedly – as indicating genuine and stable relationships between variables. In the UK case, the positive correlation between REER and exports is the result of a handful of episodes, while there overall seems to be no relationship. In the Bulgarian case, the negative coefficient attached to demand variables similarly does not indicate a stable negative relationship between foreign income/imports and export growth, but the contingent fact that exports fell just as income and imports of trading partners were booming, then recovered while trade shifted in a way that artificially depressed the foreign demand variable.

While, as the examples just examined show, SEEs can be sensitive to oddities in the data and are always to be treated with caution due to the guarantee of omitted variable bias, they allow us to draw a few conclusions on the export growth and competitiveness of the fourteen countries examined. The higher average growth and lesser sensitivity to changes in both relative prices and foreign demand of Eastern countries' exports can be interpreted as indicating higher competitiveness: Eastern countries' exports grew more and to a certain extent indifferently to appreciation and foreign demand conditions. The positive coefficients associated with REER changes for most Eastern countries likewise indicate high competitiveness. The low R^2 of SEEs for the Eastern countries point to the necessity of looking to other variables to explain their export performance, such as FDI, technology transfers or trade liberalisation.

2 See figure A2 in the appendix for a chart of exports, foreign income, foreign imports and relative prices, in log scale, for the two countries

4.4. Price or non-price competitiveness : proxy-based measures of NPC

In part 2, I've argued that so-called residual-based measures of non-price competitiveness do not in fact measure NPC. This is because real effective exchange rates, used to control for price factors, do not allow for a measure of *levels of*, only *changes in*, relative prices, and because appropriately controlling for price competitiveness at the macro level is impossible. As such, residual-based measures of NPC are informative in that they tell us whether countries's exports are adversely affected by appreciation, if they are able to expand without depreciation or if they're competitive in general : the lack of correlation between REER changes and export growth, a rising MS indicator or a high income elasticity of demand indicate some form of competitiveness, though not necessarily the non-price variety.

In this section so far, I've examined these different indicators, noting greater competitiveness of Eastern countries in general : they have higher income and foreign import elasticities of demand for exports, their market shares improved much more during the period, and their exports are largely not negatively affected by appreciation. These findings are signs rather than explanations of competitiveness, however, and do not tell us whether that competitiveness was of a price or non-price nature. Unsurprisingly, within-group divergence also shows up in these indicators : the better performing countries display higher income and import elasticities of demand for exports and a higher MS indicator, though not necessarily less sensitivity of export growth to REER appreciation. Non-price competitiveness, as measured by export composition, seems a plausible explanation of divergence within the Eastern and Western groups : countries whose exports grow more tend to sell higher proportions of machinery and vehicles or ICT than those with poorer performance.

An explanation in terms of specialisation, however, seems inadequate to account for between-group convergence. While most of the East did sport higher proportions of exports from "high value added" sectors such as ICT or machinery and vehicles than the best Western European performers, this seems an unlikely explanation of their much faster growth. As illustrated by the comparison between growth rates of a subset of Polish and Italian exports, Eastern exports were not driven by specialisation in a few faster growing categories but grew faster across the board. This faster growth cannot be plausibly explained by higher technological sophistication, complexity or quality, and can only be attributed to the countries' lower labour costs.

Eastern countries emerged from socialism with a notoriously uncompetitive industrial base : Berend (1996, chapter 5) refers to development in the previous decades as "industrialization on an obsolete technological basis" and the transition meant surging unemployment as plants could not withstand liberalisation and closed *en masse* (Ther, 2016, pp. 95-96, Okraska, 2022). In 1990, per capita income in Poland was six times lower than in Germany and the Netherlands. In 1992, productivity and wages were respectively 8 and 14% of German levels. By 2010, they had improved to 21 and 29% (Ameco, IMF International Financial Statistics). Given the much lower productivity and wages across Eastern Europe, especially at the beginning of the period, and the association between productivity and NPC, one cannot argue that Eastern European exports performed better due to their better quality or level of technology[3].

3 In German, *polnische Wirtschaft* denotes chaos and dirt.

	Export growth rate					
Model	(1)	(1a)	(2)	(2a)	(3)	(3a)
Independent variable	Coefficients					
Constant	6.98*** (2.00)	0.52 (1.77)	7.80*** (1.38)	0.21 (2.39)	7.37*** (0.80)	2.22 (1.55)
Eastern Europe		4.64*** (0.93)		5.44*** (1.55)		5.72*** (1.60)
ECI - between	-0.71 (1.41)	2.38** (1.05)				
ECI - within	-2.79 (2.36)	-2.79 (2.35)				
GERD - between			-1.27 (0.88)	2.18* (1.17)		
GERD - within			-5.25*** (1.35)	-5.16*** (1.34)		
Patents - between					-0.01 (0.01)	0.02* (0.01)
Patents - within					-0.04** (0.02)	-0.04** (0.02)
Random Effects						
σ^2	49.08	48.83	47.07	47.17	52.05	52.08
τ_{00}	3.59 Country	0.00 Country	2.75 Country	0.39 Country	2.50 Country	0.11 Country
ICC	0.07		0.06	0.01	0.05	0.00
N	14 Country	14 Country	14 Country	14 Country	14 Country	14 Country
Observations	347	347	341	341	319	319
Marginal R^2 / Conditional R^2	0.01 / 0.07	0.07 / NA	0.06 / 0.11	0.10 / 0.11	0.04 / 0.08	0.08 / 0.08
* p<0.1 ** p<0.05 *** p<0.01						

Table 6. Results of within-between panel regression of yearly export growth rates on NPC proxies and a dummy for countries' region, for 1990-2019. Source: OECD for export data, Harvard Atlas of Economic Complexity for ECI score, OECD for GERD, Eurostat for patent data, AMECO for population. Patent data is available for 1990-2017, ECI for 1995-2019 for all countries except Bulgaria, for which the series starts in 1996, GERD data for 1990-2019 for all countries except Belgium (1993-), Bulgaria, Romania and Hungary (1991-), Czechia (1995-) and Croatia (2002-). The regression is a random effects model, i.e. a hierarchical model with a constant term for each country and three independent variables : one for the country's average ECI/GERD/Patent applications across the period (between), one for the deviation in the country's ECI/GERD/Patent applications from the average for the given year (within), and a dummy for the country's region. The Intra-Class Correlations are very small, especially in the specifications with

the “region” dummy, meaning the regional dummy and the NPC proxies account for most of the inter-country variation in export growth rates. Most of the reduction of the ICC is due to the Regional dummy : the ICC is 0.07 in a Random Effects model without independent variables, 0.008 when the region dummy is included, 0 when the ECI variables are included, 0.008 with the GERD variables, and 0.002 with the patent variables. Because of the small number of countries, the “between” coefficients are based on only fourteen observations.

In addition to the lower productivity, proxy-based measures also point to the East’s lower level of NPC. This is illustrated by Figure 7, which shows levels of NPC proxies for all countries throughout the period, and Table 6, showing the results of panel within-between regressions, regressing export growth on three proxy-based measures of NPC. In each case, the proxy is negatively correlated with export growth when one does not control for the region. Higher NPC proxies are associated with lower export growth because Western countries have higher NPC scores and lower export growth. When one controls for the region, the coefficient for NPC proxies becomes positive and statistically significant : within a country group, which is to say when controlling for wage levels, the export of countries with higher economic complexity, per capita patent applications and R&D expenditure fare better.

The estimated coefficients are economically significant : the difference in ECI between Bulgaria and Poland, Poland and Czechia or Italy and Germany, about 0,6 points, corresponds on average to a difference in export growth of 1,4%. An advantage of 0,5% in GERD, such as the one between Italy and the UK or Romania and Hungary in the 2000s, corresponds on average to an export growth rate higher by 1.1%. The differences in patent applications between Romania and Hungary and France and Italy correspond to differences in export growth of respectively 0,3% and 1%. As one would expect given the signs and standard errors of the coefficients, countries’ relative positions in terms of NPC proxies tend to match their relative export performance, though the correspondence is far from perfect or uniform across indicators. Germany, Hungary and Austria thus appear well placed on all indicators, while Italy and Bulgaria do not. Other cases complicate this picture : the Netherlands thus perform poorly on ECI (perhaps because it excludes services) and GERD while Croatia places oddly well in terms of GERD and patent applications and Romania lags on the same metrics.

The *within* coefficients for all NPC proxies are negative, meaning that improvement (decline) in a country’s ECI, GERD or patent application is associated with *lower* (higher) export growth. This is due to the fact that in Eastern Europe, export growth was lowest in the post-crisis years, when GERD, ECI and patent applications were at their highest, while in the Western countries, export growth was highest in the 1990s, when patent applications and GERD were at their lowest. It is implausible that this negative correlation is an expression of underlying causation : as previously argued, the decline in Eastern European exports is plausibly explained by slowdown in growth and FDI after the GFC. Higher export growth in Western Europe in the 1990s, for its part, could be attributed to lower competition from Eastern Europe and China or the dismantling of non-tariff trade barriers through the Single European Act of 1987. Whichever explanations of these trends happen to be correct, it appears unlikely that the rise in R&D expenditures, patent applications and especially economic complexity could negatively affect exports, especially since it is associated, in international comparison, with higher export growth. The significativeness of the negative coefficients attached to *within* effects of NPC proxies also disappears when one includes average

export growth across all countries for the given year as a control variable, supporting the argument that one should not take these coefficients as indicating a causal relationship. These results show once again, however, the caution with which regression results should be interpreted.

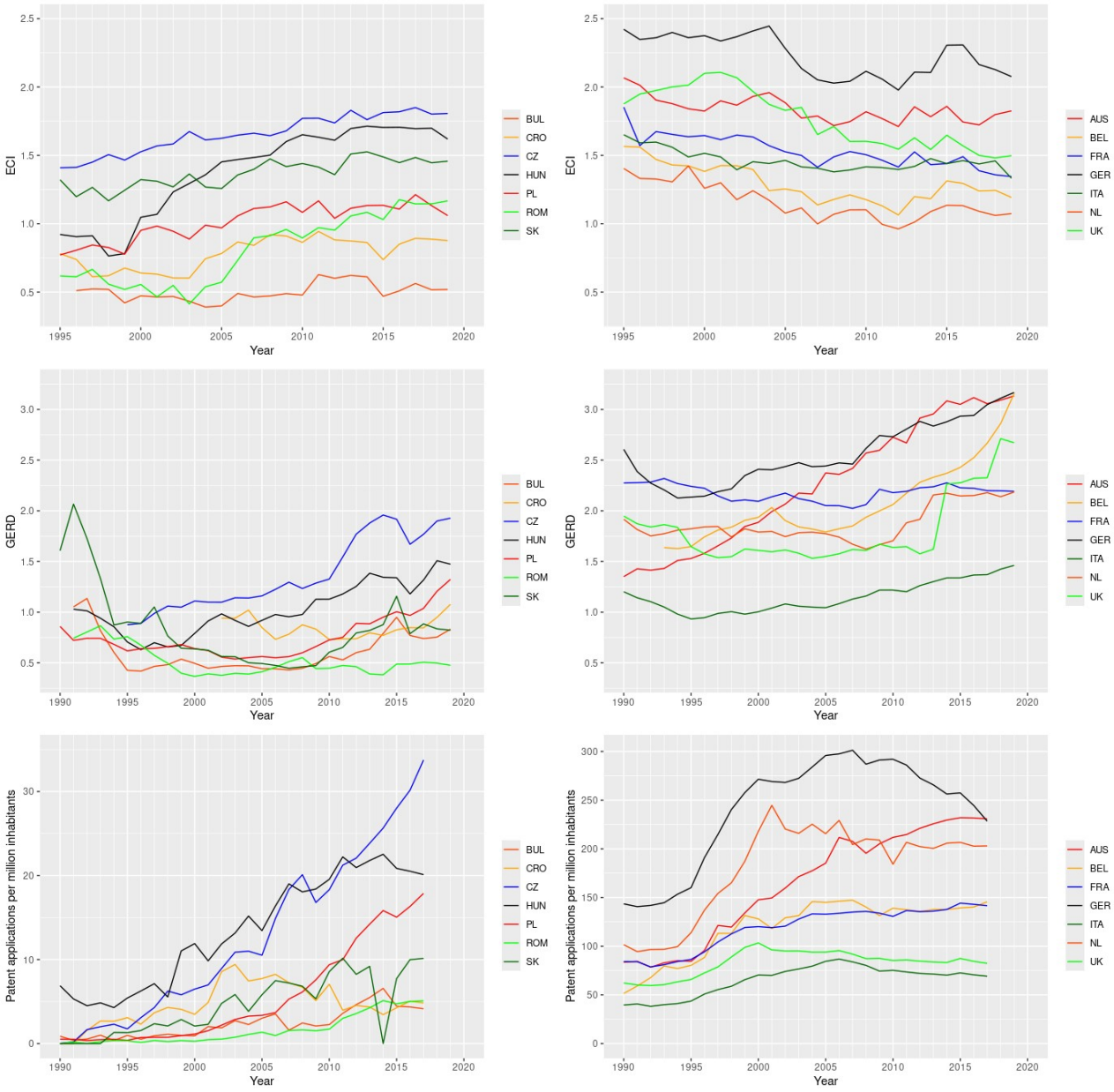


Fig. 7. NPC proxies for fourteen countries

Source: Harvard Atlas of Economic Complexity for ECI score, OECD for GERD, Eurostat for patent data, AMECO for population.

In this section, I've argued on both conceptual and empirical grounds that the previously examined indicators of competitiveness do not measure non-price competitiveness : they do not adequately control for prices and thus cannot isolate non-price factors, and they improbably show Eastern European countries to have higher non-price competitiveness than their Western neighbours. Eastern countries, having much lower productivity and emerging from economic systems characterised by technological backwardness, cannot have experienced faster export growth because their products were more sophisticated or complex. This is borne out by proxy measures of NPC : Eastern Europe scores lower than the West in terms of economic complexity, R&D

expenditure and patent applications relative to population size. These proxies are therefore associated, across the sample of fourteen countries, with lower export growth, making them unlikely explanations of the East's convergence. NPC is, however, a plausible explanation of divergence : when controlling for countries' region and looking at NPC differences within the Western and Eastern groups, higher levels of NPC proxies are associated with faster export growth[4]. This supports my hypotheses concerning the drivers of convergence and divergence : the East's faster growth was driven by its price competitiveness and occurred despite lower levels of NPC, while for a given level of wages – within each region – higher NPC was associated with more export and income growth.

4.5. Conclusion : what drove exports ?

In this section, I've examined the export performances of the fourteen European countries in my sample using indicators pertaining to competitiveness. My analysis yields tentative explanations of the convergence and divergence dynamics in the EU as well as a reevaluation of the pertinence of residual-based indicators of NPC.

Eastern European countries performed better than their Western neighbours on indicators that are often taken to be measures of non-price competitiveness. They exhibit higher income elasticities of demand for exports, higher NPC according to the "trade frictions"-based indicator (Keil, 2024) which I referred to as the Market Share indicator, and low sensitivity to appreciation. This should, according to the literature (Keil, 2024a, Storm, 2016, Blecker and Setterfield, 2019, p. 381), indicate the East's high non-price competitiveness : its convergence would then be explained by the technological superiority of its complex, high value added products. Given the much lower productivity of Eastern European countries and their rankings on proxy-based measures of NPC, this explanation is rather implausible. My findings thus point to the limits of these measures : because they cannot adequately control for the role of prices, they do not in fact measure NPC but competitiveness *tout court*. I argue that given levels of productivity, wages and NPC proxies, Eastern Europe's much faster export – and income – growth can only be explained by its price competitiveness, thus resembling a traditional case of catch-up growth. The region's competitiveness was such that its exports were not negatively affected by the sustained appreciation it saw in the 2000s, and were less affected by variations in foreign demand. The destinations of Eastern countries' exports also played a small role : compared to their Western neighbours, they traded more with other Eastern European countries and with Western Europe and thus saw faster foreign import growth.

While specialisation and NPC are not good explanations of the East's convergence, they can account at least in part for divergence within the Western and Eastern groups. The better performers, especially clearly in the East, thus distinguish themselves through more favourable export composition with higher proportions of machinery and vehicles and ICT than countries with slower export growth. Faster export growth, when controlling for the region, is also associated with higher NPC proxies : countries with more complex and technologically advanced production, as measured by the Economic Complexity Index, R&D spending and patent applications, saw higher

4 As discussed below the regression table, the variable that explains most of the between-country variation in export growth, however, is the region dummy, i.e. the East's price competitiveness.

export growth. Export destinations also played a minor role in Eastern European divergence : the slower-growing southern countries, Bulgaria and Croatia, traded more with southern Europe and Western Asia and less with Europe's core, resulting in slower foreign demand growth than their northern neighbours of the Visegrad group and Romania.

The findings laid out in this section thus support my hypotheses that Eastern Europe's convergence towards the West was driven by price competitiveness, while divergences within country groups were caused by differences in non-price competitiveness. They also point to serious difficulties in measuring price and non-price competitiveness and flaws in residual-based indicators of NPC which do not in fact measure what they purport to measure.

5. Conclusion : results, limits and prospects

In the three decades of expanding trade following the Maastricht Treaty, differences in export performance and balance of payments dynamics have played an important role in the economic performance of European economies. Thirlwall's balance of payments constrained growth model is a good predictor of income growth rates for the fourteen countries in my sample : rates of export growth and income elasticities of demand for imports translate into dynamics of convergence and divergence. Eastern Europe's convergence, like diverging outcomes within the Eastern and Western groups, for example between Italy and Germany or Bulgaria and Poland, thus correspond to differences in both export growth and income elasticities of demand for imports.

This pattern lends support to hypothesis H1, according to which exports played a role in both Eastern countries' catch-up and within-group divergence. This observation in itself is not evidence enough in favour of a causal interpretation : it does not tell us whether exports drove productivity growth (C1), allowed income to expand by alleviating the balance of payments constraint (C2) or, as in Krugman's view, if they were a result rather than a driver of productivity growth. A Kaldorian interpretation, in line with C1, is not implausible : countries whose trade grew faster tended to export greater proportions of high value added sectors such as machinery, vehicles and ICT, which could plausibly have driven their income and productivity growth through access to large markets and economies of scale. This interpretation is also coherent with the view of CEE countries as "dependent economies" or "workbenches", benefitting from being export-oriented manufacturing bases for Western European corporations (Nölke and Vliegenhart, 2009, Gräbner-Radkowitsch et. al., 2022) : it is more plausible to see these countries' place in global value chains as driving their income growth than to argue that it is their income growth which drives their export performance. An examination of the evolution of countries' trade balances also favours a Thirlwallian view in which income adjusts downwards in order to keep the current account in balance : in economies which sported trade deficits, it was reductions in income or income growth, not increases in export growth, which drove rebalancing.

Describing this pattern as rebalancing, however, may be problematic : the post-GFC period saw an improvement in the external balances not just in deficit countries, but in most economies. In the case of Eastern Europe, one could argue that the rebalancing that took place is best described as a reversal of a financial cycle rather than BOP adjustment : the slowdown in domestic demand growth followed reductions in capital inflows as the Western financial system reeled from the financial crisis. According to this reading, credit dynamics are the driving force and the balance of payments

a symptom. The slowdown of Western European FDI into Eastern Europe could also explain the reduction in the East's export growth, as Eastern firms, benefitting from fewer transfers of Western technology, made slower gains. Though the level of analysis and the variables considered do not allow for forceful causal claims, the evidence presented lends support to a view of growth as export-led and balance-of-payments constrained. This analysis improves on the dominant analysis of trade dynamics in the GMP literature, showing their importance for the growth of supposedly domestic demand-led economies (Hein, 2022, Kühnast, 2022). The dynamics in the Western European countries considered also give credence to the thesis that the Economic and Monetary Union, through its fiscal rules, forces economies into pursuing external surpluses and thus, from a BOPCG perspective, unduly restrains income growth (Zezza, 2020, Kregel, 2023).

The export success of Eastern European economies causes them to perform much better than their Western peers on various measures often taken as measures of non-price competitiveness. Their exports exhibit higher foreign income and foreign import elasticities of demand, they are less vulnerable to changes in foreign demand conditions, apparently unaffected by currency appreciation, and they perform better on an indicator of NPC based on trade frictions models of trade. Given the much lower wage and productivity levels of Eastern countries, their scores on proxy measures of NPC and their history, an explanation of their export success in terms of higher quality or technological sophistication is unlikely. Price competitiveness therefore seems to be the only explanation for Eastern countries' export success and catch-up growth. Though Standard Export Equations and descriptive evidence appear to show that Eastern exports were not at all affected by appreciation – the fastest spell of export growth coincided with a period of massive appreciation in the run-up to the GFC –, it is plausible that the slower export growth and reduced capital inflows in the post-GFC decade reflected Eastern countries' lowered attractiveness as a result of the considerable appreciation of the 2000s. Indeed, one would expect catch-up growth based on low wages to only take an economy so far before labour becomes too expensive to attract investors.

Hypotheses H2 and H3, stating that Eastern Europe's convergence was driven by price-competitiveness and divergence within the Eastern and Western groups was driven differences in non-price competitiveness, are borne out by a panel regression of export growth on various proxies of NPC and a dummy to control for countries' region and, indirectly, their price competitiveness. When one does not control for countries' region, NPC is associated with lower export growth, as the poorer, less technologically advanced East saw faster growth than the West. When one controls for the region, and therefore countries' wage levels, NPC proxies become associated with faster export growth : price and non-price competitiveness both play a role, and one needs to control for one factor in order to measure the effects of the other. One should bear in mind, when discussing these results and the role of price competitiveness in Eastern countries' catch-up, just how low incomes and wages were in Eastern Europe in the 1990s and how they remain compared to those in Western Europe : Polish manufacturing wages were at 11% of the Italian level in 1990, and 36% in 2019. As argued above, the slower growth of Eastern European exports after the GFC may be a sign that the appreciation they saw in the 2000s already made them less attractive destinations for manufacturing FDI. Within the Western group, despite the negative correlations between REERs and export growth in many of the standard export equations, depreciation was not generally associated with export success : relative prices decreased, over the period, in Italy, France, Germany, Belgium and

the UK, four of which saw poor trade performance. Relative prices did not show a downward trend, however, in the Netherlands and Austria, two relatively good performers. Price competitiveness thus benefitted countries with much cheaper labour and contributed to their convergence, but did not seem to make a difference for economies *given a starting level of income*. These results lend support to the claim, made by the likes of Gräbner and coauthors (2020) and Storm and Naastepad (2016), that price competitiveness is no substitute for technological capacity and wage repression is no growth model : the Eastern European countries which benefited from their cheap labour were, and still are, much poorer and less productive than then Western competitors.

Eastern Europe's convergence produces results that point to the limits of residual-based measures of NPC : because REERs do not measure levels of relative prices, they do not allow for appropriately controlling for price competitiveness and therefore measuring NPC. Proxies fare better, though they also pose some issues : indicators such as R&D expenditure and patent applications, measured at the national level, do not measure the technological sophistication and skills acquired through the use of foreign technologies, while the economic complexity index is calculated based on data on the trade of goods and thus underestimates the technological and human capital of countries with high-value added service sectors.

My results are limited by the data and methods used to account for price competitiveness. While I've argued that CPI-based REERs are a better price variable than ULC-based REERs in that they actually measure prices, they are problematic in that they describe variations in the general price level of consumer goods. As such, they exclude intermediate and capital goods, are affected by many prices that have nothing to do with export competitiveness and by different national consumption patterns. As far as methodology, I used dynamic SEEs based on annual data and descriptive statistics rather than ARDLs that would have enabled me to quantify long-run relationships between variables. While my methodology allowed for a more qualitative analysis of long-run economic trends, it has meant I was not able to estimate long-run price or income elasticities which would have provided more information, with a more rigorous statistical basis, on the relationships between my variables. Notwithstanding these limitations on the question of price elasticities pointing towards avenues for more research, this paper presents empirical and theoretical reasons to question methodologies employed in the literature concerned with price elasticities and non-price competitiveness, especially the use of residual-based measures of NPC and ULC-based REERs as a relative prices variable.

The argument of Gennaro Zezza (2020) and Jan Kregel (2023) to the effect that the institutions of the Eurozone force countries into destructive austerity and the pursuit of external surpluses, cited above, hints at another limit of my argument : the omission of institutional, political and historical factors. To take but two examples : first, the finding that the East's convergence was due to price competitiveness thus begs the question of the institutional and contingent factors that conditioned this convergence. The region's proximity to the EU core making it an attractive destination for FDI (Berend, 2009, chapter 4), EU enlargement, the adoption of the *Acquis Communautaire* and other institutional reforms or the social and economic legacy of the region's recent socialist history (Piątkowski, 2018) would thus bear looking into. Second, divergence within the East begs the question of the causes of between-country differences in NPC, be they human capital developed during socialist reforms in the 1980s (Ther, 2016, pp. 120-126), a "prime mover advantage" accruing to those countries which embarked on liberalising reforms fastest (Ibid., p. 97), policy

choices and the politics of the transition or geographical proximity to the EU north. One could list at length similar avenues for investigation concerning divergences in Western Europe.

Finally, the thorny question of measuring price and non-price competitiveness makes painfully clear the limits inherent to analysis at the macroeconomic level. An analysis of diverging export performances would surely benefit from analysis at or closer to the level of firms, be it microeconomic investigation of cost structures and performance or qualitative inquiry into firm's relocation and production decisions.

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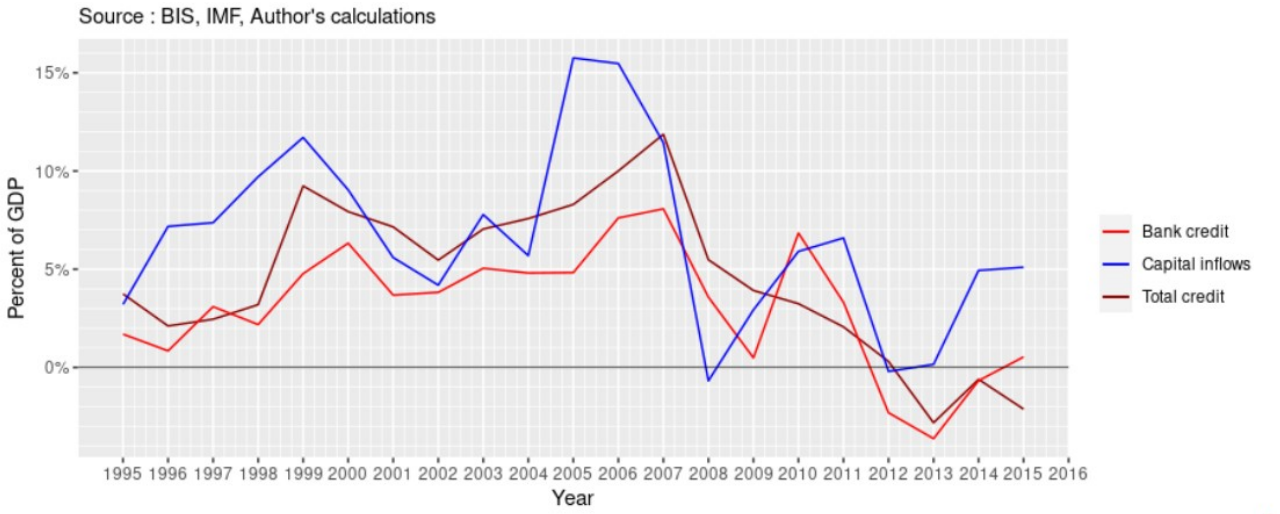
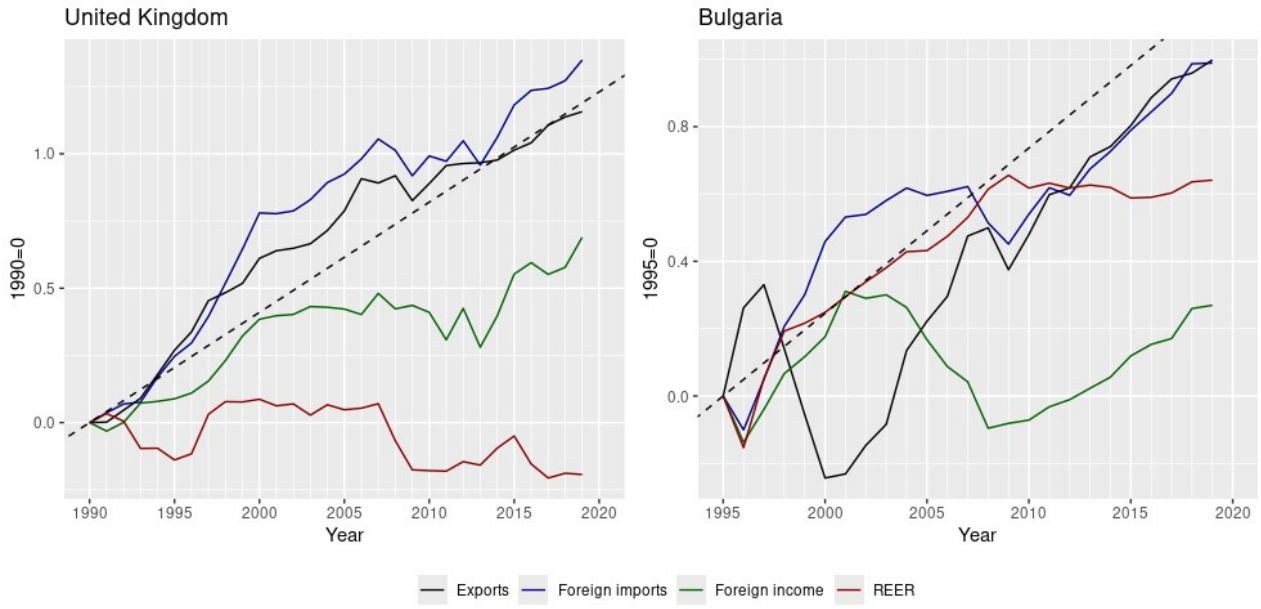
Appendix

Figure. A1. Credit in Italy in the run-up to and aftermath of the GFC.



Total credit is net credit to the private non-financial sector, bank credit is net bank credit to the private non-financial sector, capital inflows are net acquisition of foreign liabilities (FDI, Portfolio, Other).

Figure A2. Exports, foreign income, foreign imports and relative prices, in log scale, for Bulgaria and the United Kingdom



Source : OECD, IMF International Financial Statistics, Harvard Atlas of Economic Complexity.