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국제학석사 학위논문

Regional Integration and
Productivity Convergence
in Europe and Asia

유럽과 아시아의 지역통합과
생산성 수렴 비교

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Abstract

Regional Integration and Productivity Convergence in Europe and Asia

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The European Economic and Monetary Union (EMU) eliminated geographic barriers of economic and monetary activity, but regional integration of trade and currency did not lead to stability through mutual convergence over long-term. Instead, the recent crisis starkly exposed a fundamental lack of convergence between the real economies of “core” versus “peripheral” countries. One possible starting point of analysis could be that some crucial link is missing between facilitated financial inflows and subsequent growth of the real economy. At the same time, a current of popular arguments from media outlets, national consumers, and some academic camps decries lacking macroeconomic prudence, social duty, and work ethics in peripheral countries. Here I see the danger of nationally biased views and therefore find it necessary to dispute potentially oversimplified judgments. Thus I decide to investigate two additional angles that lend me a constructivist outlook regarding growth mechanisms and their allocation between varying conditions in the EMU.

The first angle in my view should be a comprehensive indicator such as productivity growth, which produces significant points of analysis regarding heterogeneous growth trends if its comparative development over time is observed. Hence I appreciate and utilize the factorial composition of labor productivity as a comprehensive real economy indicator that comprises macroeconomic management, labor and welfare especially during calm times. During crisis times it retains a function as well, since it seems to act as a buffer against financial crisis shocks, underlining that financial speculation stops short of solid economic fundamentals. These fundamentals, however, are comparatively very sparse in peripheral countries and set a limit to possibilities of macroeconomic management especially in volatile times. Then, labor and welfare are the remaining candidates for culprits, and I inspect unit labor cost trends over time for the same reasons of factorial composition as above. Secondly, there are at least two time frames that are divided into normal times and crisis times, where macroeconomic behavior is subject to shifts. Thus I would like to check the above two measures for any perpetually inherent effects of the euro itself that reveal growth inhibiting aspects of the monetary union. If the euro limited the means for making necessary adjustments that are conducive to productivity growth, productivity convergence over the span of eurozone history would be vulnerable to important euro events including the crisis. Summing up the two angles, I thus use an event- and time frame-based approach in order to discern some euro-related effects on labor productivity and unit labor cost to the frontier country Germany. My method is to derive relative convergence differentials and volatility deviations of the above two major indicators via a simple set of formulas. A brief comparison to Asia offers a

parallel world without monetary union and the consequent political economy issues.

Based on these gathered findings, it is possible to confirm fundamental weaknesses of peripheral countries in the following marginal sense. Weak performance in utilizing (normal times) and fending off (crisis times) financial flows is highly related to their gaping lack of convergence in productivity and unit labor costs. Also, the economic and monetary union is indeed likely to be better at causing convergence in labor welfare.

However, a closer look at root causes can negate part of the burden on these countries.

1) Relative trends over time in a monetary union reflect a greater need for mutual monetary balance than other non-union regions require. In this light, trends suggest that macroeconomic management of these countries *vis-à-vis* Germany were reasonable reactions. However, since monetary policy is closest to German utility and beneficial for its export basket, monetary shocks cannot be adjusted and may limit fiscal devices for investment and technology in peripheral countries. At least one of the results is inflationary pressure in these countries. I demonstrate this by the means of empirical price convergence trends, for which I utilize the same methodology of deriving bilateral differentials and standard deviations. This method also alleviates the above lack of productivity data/ULC data for post-crisis outbreak years, by illuminating the macroeconomic situation from inflation trends in non-tradable goods.

2) The next notable aspect in my view is the great extent of divergence that peripheral countries display over time *vis-à-vis* all EU member countries including Germany.

Impending crisis was- as is deducible without further ado from these easily available

data- hardly a surprising prospect. An issue of such nature is all the more inadvertent because if national productivity growth is already low, stimulation becomes more difficult in an integrated monetary region. Then the question becomes important which justified burdens of responsibility go to either peripheral countries or the monetary union, and which part of the problem's origin actually stems from the monetary union. Hence, I conclude that part of the 'sin' lies in the euro, and thus the monetary union's design that is included therein. 3) Lastly, I observe and state an accompanying effect that disturbs, and expresses its influence from the event- and time frame-based approach which I used. I mean the political economy in the EU, which creates shocks as an externality from the lack of political union. Despite clear and alarming signs of divergence, the political economy of the EU does not incorporate the possibility of subsequent repercussions, which explains cacophonous distress especially in crisis times. The root cause acts quietly in the background during calm times, since there is no voice, instance, or specialized interest that addresses the issue of declining economic terms in the peripheral countries. Then during crisis times, decisions on the EU-level create a political economy that is toxic for peripheral countries, automatically sending financial shocks towards them which are terminally harmful. Hence, the monetary union with its monetary, economic, and financial disadvantages is not harmonized with EU political economy. These are two different problem sets, but they mutually reinforce each other. It also offers the constructivist interpretation for understanding potentially oversimplified arguments by media, population, and academia.

In short, empirical results lend substance to the argument that a weighty role falls to 1) the euro and 2) eurozone political economy when it comes to allocating the causes of persisting divergence in peripheral countries. A core-centered political economy in tandem with impossible adjustment leads to inflationary pressure in normal times, impeding growth channels of relatively weak countries that are characterized by low productivity. In crisis times, the same problems merely take an exponential form, due to the supremacy that financial flows dictate.

Keywords: regional integration, monetary union, productivity, political economy, financial flows, inflation

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Glossary

CDS	Credit Default Swaps
ECB	European Central Bank
EMU	European Monetary Union
EU	European Union
OCA	Optimal Currency Area
ULC	Unit Labor Cost

I. Introduction

The EMU eliminated geographical barriers, among which are trade tariffs and exchange rate fluctuations. This novel execution has led to a strengthening of the Euro as a currency on the global market, while facilitating trade in the internal market. However, regional economic and monetary integration is a complex construct which escapes expectations of mutual growth within the EU. Economic and monetary integration is far from a single genesis, but comes in numerous flavors and segments. Main categories alone are monetary, financial, and fiscal, with them splitting into a multitude of subcategories. Their relative successes at integration influence and also impede welfare and economic development. For example, financial integration can reduce the cost of capital, and thus create investment effects that are conducive to innovation, technology, and economic growth (Hartmann et al., 2003). The EU balance is steeped atop a web of arrangements, and an institution such as the European Central Bank (ECB) harbors a great interest in the goal of stability. Indeed, financial integration is significant for stability because it will enable the effective transmission of monetary policy (Baele et al., 2004). Such noble motivations are now faced with a web of failures, spawned by financial shocks despite above efforts. Where did it go wrong, and what did the EU miss?

While financial integration in the Eurozone had indeed increased and capital allocation went equally to peripheral countries (Schmitz and Von Hagen, 2011), the Southern eurozone was caught unguarded and entered a downward spiral. A main cause of this imbalance is a lack of economic convergence between a highly

heterogeneous set of countries, against which the EU model of regional integration has had little influence and preparation. The respective real economies of countries provide a display of evidences. Regional integration is only weakly present in price and product market convergence (Engel and Rogers, 2004). This problem is serious because peripheral countries cannot defy strong price divergence, especially during inflation (Becker and Nautz, 2012). Integration therefore precludes or even equals eventual convergence in the long term, because stability requires a progressing similarity of structures between countries. Hence, it can be postulated that some crucial link is missing between financial inflow and subsequent growth of the real economy.

The EU suffers greatly from having missed to complete this equation long before the current crisis. Large gaps between finance, monetary policy, and the real economies are absolutely harmful in a monetary union during crisis times. Regarding this problem, some authors argue that this gap be unavoidable due to heterogeneous preferences and economic path dependencies, ultimately rendering assimilation nearly impossible (Feldstein, 2011). While this viewpoint is true indeed, I interject that related opinions may be prone to commit oversimplification. Hallmarks of this error are often found in popular media and their propagated statements, where peripheral countries are berated for their alleged shortcomings in macroeconomic prudence, social duty, and work ethic. However, that cannot be all. An integrated region surely is not yet fully grasped in its economic and monetary features, which means that issue analysis hinges on an incomplete academic oeuvre. Adding to the difficulty are the

various stages of completion towards final integration, and the state of the EU without political integration as one of the last instances. Hence, I set out in my paper to reach a deeper insight. In order to analyze the causes of divergence in the setting of an integrated region, I choose to investigate two additional angles. Firstly I look at productivity growth, for its composition proxies a comprehensive product of crucial real economy indicators. Secondly I check for any effects of the euro- *ergo* the monetary union- prone to impede growth in peripheral countries. Relative trends in productivity convergence over the span of Eurozone history would in that case be perceivably hit by important eurozone events. If the euro limited the means for making adjustments conducive to productivity growth, convergence over the span of eurozone history would thus be vulnerable to the monetary policy *as is*. Therefore, I try to discern some euro-related effects on labor productivity and unit labor cost to the frontier.

My method follows labor productivity and unit labor cost to the frontier by means of deriving convergence differentials and volatility deviations via a simple set of formulas. The standard-setting function of the frontier country, Germany, is well reflected in the monetary stance of the euro. A brief comparison to Asia offers a parallel world without monetary union and political economy issues of the same caliber. While this comparison is far from perfect, the surprising extent of fulfilled OCA criteria for Asia justifies this choice to some degree. Furthermore, I hope to marginally reduce one of the typical shortcomings of economic methods, which is the lack of a neutral sample. The resulting findings confirm fundamental weaknesses of

peripheral countries as below. Their weakness in utilizing (calm times) and fending off (crisis times) financial flows is highly related to their gaping lack of convergence in productivity and unit labor costs. Also, the economic and monetary union is indeed likely to be better at causing convergence in labor welfare.

However, a closer look at root causes can negate part of the contextual burden on these countries as follows. 1) The first aspect is structural on a monetary level: Monetary and financial shocks cannot be adjusted for want of monetary tools, which is likely to limit fiscal channels towards investment and technology in these countries. At least one of the embedded consequences is inflationary pressure in peripheral countries. I show this via price convergence trends in untraded goods. 2) Another aspect is structural on the whole EU level: trends underline the relative divergence of peripheral countries *vis-à-vis* all remaining EU member countries. According to these readily available data, an impending crisis was an unsurprising prospect. However, apt devices failed to manifest in time. Unfortunately, this unresolved issue is self-reinforcing and time sensitive: If productivity growth is already low, its stimulation becomes more difficult in an integrated monetary region. 3) The last aspect notices and thus addresses political economy as a phenomenon that is especially hyperbolic in the EU. Despite these alarming structures, the political economy of the EU is contra-effective against the possibility of such repercussions. During calm times, there is no voice on the EU level for the declining peripheral countries to improve their terms. During crisis times, decisions on the EU-level create a political economy

that is toxic for peripheral countries, by sending financial shocks towards them.

Ultimately, all times are harmful for productivity growth in select countries.

To sum up, empirical results lend substance to the argument that a weighty role falls to 1) the euro and 2) eurozone political economy when it comes to allocating the causes of persisting divergence in peripheral countries. A core-centered political economy in tandem with impossible adjustment leads to inflationary pressure in normal times, impeding growth channels of relatively weak countries that are characterized by low productivity. In crisis times, the same problems merely take an exponential form, due to the supremacy that financial flows dictate. Laying out this study in its details, my paper proceeds as follows: I oversee relevant studies in section II, explain data and method in section III, discuss empirical results and a comparison to Asia in section IV, determinants in section V, and implications in section VI. I conclude in section VII.

II. Literature Review

The crisis may or may not have come surprisingly, which partly depends on the amount of information at disposal. Since some time, there have been long-term current account imbalances in the eurozone and productivity divergence in peripheral countries (Holinski et al., 2012, Sondermann, 2012). Literature on the EU monetary arrangement understandably experienced a change of tide after the sovereign debt crisis, and current economic models see the need to discuss calm periods as well as crisis periods (Fischer and Dötz, 2012, Lombardo and McAdam, 2012). Since the current financial distress is fed by the default possibility of the weakest national governments after 2008, I thereby assume that financial pitfalls have their fundamental roots in the calm periods. I review these linkages for different chronological segments: normal times and crisis times. Lastly I scrutinize the binding agent, which consists of the euro and its political economy.

Normal times

Without financial crisis, the main issues are the real economy and monetary union. More precisely, how the business cycle is influenced by credit markets, monetary variables, and interest rates (Giannone et al., 2012). There is only one Central Bank and its monetary policy affects multiple markets heterogeneously due to currency misalignments (Coudert et al., 2012). Nevertheless, there are grounds for convergence. Empirical research shows that private sectors in countries with formerly weak currencies benefited from the euro, while those under formerly strong currencies lost

in return (Bris et al., 2006). Under the euro, firms were able to increase investment and release financial constraints, in turn decreasing the investments of firms that were under strong currencies. Additionally, the Balassa-Samuelson effect is in force. Most tradable goods show price convergence in the EU (Allington et al., 2005). Such increased intra-regional trade and dependence should *per se* lead to integration and convergence (Camarero et al., 2012). From the production perspective, manufacturing spillovers are not blocked by national and cultural institutions (Van Ark et al., 2008). Overall, the EU and the single market provide basic conditions for regional convergence. However, reality is less simple: Labor productivity growth declined after 1995 (Timmer et al., 2011).

Game change

A considerable imbalance latched onto the euro after the Lehman default in 2008. Fiscal debts overshoot their stature as a signal for financial markets, risk aversion is higher, and German bonds obtained a safe-haven investment status (Von Hagen et al., 2011). While contagion effects from Greek downgrading did play a role, their weak economic fundamentals ultimately seal the deal for market participants (De Santis, 2012). Since the EU reacts just like the US to the same financial shocks (Matheson, 2012), the shockwaves are absorbed by peripheral countries. Once thrown off balance, the financial sector, market perceptions, and core Europe dominate the fate of peripheral countries in this hyperbolic setting (Wray, 2012, Pisani-Ferry, 2012). This is a strong clue regarding the lack of productivity and growth in peripheral countries.

However, more euro-related factors need to be considered. Compared to other regions, the eurozone is at times prone to more variables of instability. The euro is not a simple currency peg and entails financial and political tension (Canofari et al., 2012). Self-fulfilling financial crises in the EU became stronger since 2010, partly as a result of neglecting high government debt for years (De Grauwe and Ji, 2012b). Poorer EU countries that experienced inflation pre-euro tend to expect continuing inflation, despite the euro having reduced aggregate inflation (van der Cruysen and Demertzis, 2011).

Political economy and its economic meaning

Finance or economics alone does not cover the nature of EU-level processes. Political economy must obtain a greater role in the face of large heterogeneities. In calm times, contracting monetary policy transmits shocks across country economies. The results are rising budget deficits and shrinking private sector borrowing by firms and households (Bonci, 2012). Due to interest rate differences, heterogeneous responses are likely. The flow of funds affects the real economy in one eurozone country in a qualitatively similar way as the whole eurozone (Gameiro and Sousa, 2010), but starting positions of member countries notably diverge. This heterogeneity of output shock is due to two conditions: debt overhang and fundamentals (Ahearne and Wolff, 2011).

Fundamentals and subsequent export strengthening are indeed a key for Greek recovery, and foreign investment would flock to positive growth outlooks (Weisbrot

and Montecino, 2012). The union context, financial balance, and the danger of moral hazard impede such clear solutions (Gros, 2011). Developments on rebalancing are slow and worsen economic and social conditions (Valiante, 2012). This political delay is typical for the eurozone, but increasingly affects financial stability. For example, domestic economic sentiments such as market perceptions and market volatility are of utmost significance for restoring financial stability (Georgoutsos and Migiakis, 2012). Only with these stabilities can the economy generate fundamental productivity growth.

While fiscal and legal frameworks control excessive debt accumulation (Scott, 2012) political economy can be a hindrance to recovery. A recent study follows shocks generated by information¹ on the news which are clearly associated to Greek sovereign risk (Brutti and Sauré, 2012). Sovereign CDS² play a major role in inflaming existing weaknesses. Resulting bursts take a financial channel but originate from structural sores. This explains why peripheral economies in the EU are exposed to long-term risk³ due to their economic histories (Kaya and Gunduz, 2011). If peripheral countries are hit by sticky market perceptions, then productivity will suffer.

Up to here, I first gave an overview on three main problems at all times: monetary union, economic fundamentals and lastly financial volatility from the recent crisis.

¹ Including the following: “the release of fiscal data, policy announcements and specifically severe debt downgrades” BRUTTI, F. & SAUR, P. 2012. Transmission of Sovereign Risk in the Euro Crisis. *Working Papers*.

² Credit Default Swaps

³ E.g.: “long memory properties for volatility of sovereign CDS returns“ KAYA, O. & GUNDUZ, Y. 2011. Sovereign Default Swap Market Efficiency and Country Risk in the Euro Area.

The latter problem superimposes on the two original problems, which is a structural matter. In order to examine this linkage more deeply, I investigate the political economy during eurozone events and its effects on productivity divergence. The EU mechanism is inherently present throughout all events and before the introduction of the euro, when preparations took place prior to joining the euro. Political economy of the euro exists at all times despite any other changing variables, and so I assume that it provides me with a constant perspective. My aim thus is to peer in more detail at the lacking conditions for productivity convergence.

III. Data and Method

1. Data

The EU KLEMS database is available for the manufacturing sector during the period 1970-2006 in current prices (Timmer and De Vries, 2009). I use it throughout as a source for a) value added b) employment numbers c) labor costs. It covers fewer countries in Asia than I would like to observe. Only Japan and Korea are covered by EU KLEMS. I source the remaining Asian countries from the GGDC 10 Sector Database, which offers perfect compatibility with EU KLEMS database. Even after combining both databases I still lack labor cost data for the Asian countries excluding Korea and Japan. I leave this part of data aside for the future. There is no analysis of unit labor cost in Asia excluding Japan and Korea, since labor cost data is necessary for it.

Countries in the GGDC 10 Sector database are Hong Kong, India, Indonesia, Japan, Malaysia, Singapore, South Korea, Taiwan and Thailand. EU countries in the GGDC 10 Sector database and EU KLEMS are West Germany, Denmark, Spain, France, Italy, Netherlands, Sweden, and the UK. I augment with the following countries from the EU KLEMS database: Finland, Greece, Ireland, and Portugal. Throughout this paper the manufacturing sector classifies as “Manufacturing, Major division 3, Division 15-37 D”.

There is no published statistical information for Asia on a comparative basis for long term productivity levels. Some organizations provide series with sectoral detail: representative sources are the sectoral GDP series in the annual United Nations, the National Accounts Statistics, or the International Labor Organization with sectoral detail on employment statistics in its *Yearbook of Labor Statistics*. The Asian Development Bank offers data within its Statistical Database System (SDBS). Presented series are short and unorganized in cross-country coherence. The GGDC 10 Sector Database intends to alleviate. It offers long time series on GDP and employment as a basis. Data is more consistent over time and with each other, a result of having analyzed national and international statistical sources. If international data sources were used, they were checked against national data. Presently, the database provides series on GDP at current/constant national prices and employment of nine Asian economies. Both constant prices and current prices are available. *Constant* prices represent figures with the effects of inflation removed. *Current* prices are expressed in terms of prices at that time. I use constant prices because my aim is to measure cross-country convergence with fewer possible distortions. Using *constant* prices is more suited for approximating individual growth effects over long periods. For the consideration of inflation effects, the *current* price data is useful.

The EU KLEMS database is a main source for the above GGDC 10 Sector database. EU KLEMS is a growth accounting database that was supported by the European Commission, Research Directorate General as part of the 6th Framework Programme, Priority 8, 'Policy Support and Anticipating Scientific and Technological Needs' as

part of the ‘EU KLEMS project on Growth and Productivity in the European Union’⁴. From this EU KLEMS database stems data for labor compensation in European countries. The database lists the compensation of employees in millions of local currency, alongside variables of output/intermediate output accounts. Labor compensation is derived by “applying the ratio of hours worked by total persons engaged to hours worked by employees to compensation“ (Timmer et al., 2007). I call this simply ‘labor cost’ in my paper. Labor compensation data for Asian countries are patchy, but can be partly sourced from the ILO online database. Country data with large breaks are Indonesia, Malaysia, Taiwan, and Thailand. Since the breaks make a head-on-head comparison with the EU difficult, I refer only to Korea and Japan where it is adequate.

I see the need to briefly elaborate the difference between two possible notions of labor compensation. Exact terms for the two definitions differ minimally from source to source, and I choose to borrow principally the terms used in the EU KLEMS database- thus, “compensation of employees” expanded by the wider notion of “labor compensation”. The latter includes wages and salaries, but also “all other costs of employing labor which are borne by the employer”⁵. It is available most times from the national Labor Force surveys. A more clarified segregation of the two notions is also provided by the *OECD Main Economic Indicators: Sources and Definitions*⁶ as follows: a) *Wage rates* are the most basic unit, expanding into the notion of b)

⁴ “The project was carried out by a consortium of 24 research institutes and national statistical institutes” O'MAHONY, M. & TIMMER, M. P. 2009. Output, Input and Productivity Measures at the Industry Level: The EU KLEMS Database*. *The Economic Journal*, 119, F374-F403.

⁵ EUKLEMS Growth and Productivity Accounts, Part I, Methodology, Version 1.0, 2007

⁶ <http://stats.oecd.org/mei/>

earnings which includes all other payments such as overtimes and bonuses paid. This expands into the notion c) *compensation of employees*, by including necessities such as social security contributions by the employer, severance payments, and the like. And lastly d) *labor compensation*⁷ represents all of the above plus remaining employer expenses such as vocational and welfare training, recruitment, transport of workers, taxes regarded as labor costs, and so on.

The methodology of the EU KLEMS database therefore surmises labor compensation into the section of input shares. Input shares denote the input weights for the two production factors of labor and capital respectively; and thus, input shares reflect the marginal cost of labor and capital. Labor compensation (or rather, *compensation of employees* in my terms) is defined in the National Accounts as based on the value added in basic price. EU KLEMS takes these primary compensation values and stretches them to the price of labor (*labor compensation* in my terms) by adding relevant taxes and one part of the operating surplus, which accords to compensation for self-employed. The remaining part of the operating surplus should be funneled into the counterpart of labor cost, which is capital cost. Henceforth assembled capital cost comprises the following: relevant taxes and operating surplus, minus the above subtracted part that goes to the compensation for self-employed⁸. One reason for this procedure is that the labor compensation of self-employed is not found in the National Accounts. So this part of data is a reconstruction within the constraints of the possible,

⁷ Denoted as “labor costs” in the OECD definition

⁸ In formula as follows: $LAB = PL = T + LC + LC_{self}$; and $CAP = PK = T + OS - LC_{self}$. (LAB=labor cost; CAP=capital cost) As written by EUKLEMS Growth and Productivity Accounts, Part I, Methodology, Version 1.0, 2007, page 46

as conducted by EU KLEMS. In other words, the growth accounting part is an analytical contribution which cannot be directly derived from National Accounts data, not without additional assumptions (O'Mahony and Timmer, 2009). Underlying factors of these proximate sources of growth, to which input growth belongs, always adhere to deeper causes such as technical change, institutions, geography, macro-economic policies, et cetera (Maddison, 1995).

2. Method

Convergence is commonly measured in either a cross-sectional or time-series approach via unit root tests. Bernard and Jones (1996) established the role of technology for empirical convergence studies. They used Y/L to calculate productivity, and found out that cross-country dispersion falls for total industry while it rises for manufacturing. Their paper defined basic assumptions that are still valid today. Heterogeneities of countries and disaggregate sectors are taken into consideration. Countries de facto converge towards the world technology frontier. Since then, the importance of technological differences has been brought to the fore. Many new quantification efforts for technological generation and diffusion emerged⁹. TFP convergence is widely regarded as the closest measure for technology. Cameron et al. (2005) investigate the effect of various factors on technological growth towards the frontier. The utilized theoretical framework is a standard neoclassical production function, in which technical efficiency features as TFP. The country with higher TFP

⁹ Comprehensive exposé by ISLAM, N. 2003. What have we learnt from the convergence debate? *Journal of economic surveys*, 17, 309-362.

is the technological frontier. Thus, the authors arrive at a difference equation for the technology transfer potential of relative TFP. However, there is a drawback to this method. The authors note that this is a general method of estimating TFP. Above, the two methods share a same approach of technology differentials. Both papers note that measuring TFP is a difficult task. Labor productivity on the other hand is similar to TFP, but takes into account TFP without explicitly stating so. Instead, its method places output *vis-à-vis* employment numbers. It therefore inserts labor into the equation in order to gauge productivity. Compensation should play a role in observations of the eurozone, since converging effects on wage setting and welfare standards are expected.

Parsley and Wei (1996) followed a similar goal, but with different data and a focus on convergence as a result of intraregional trade. They took the approach of examining price convergence in integrated regions. City price data was used for this purpose. Relative gaps show divergences between leaders and laggards. Means of the log differences arrange bilateral pairs into relation. This method was extended by Moon and Rhee (2008), who complemented the former study by considering mean differentials alongside standard deviations. Both measures together give a meaningful picture of convergence, since data could be distributed widely or narrowly. While the mean differential conveys the vertical extent of bilateral technology gaps, the standard deviation measures the breadth of divergence among countries. From this body of research I pick up some parallels that are applicable to my topic. I devise an approach for labor productivity differentials. So I examine convergence of labor

productivity and unit labor cost. I exploit the convergence hypothesis¹⁰ by presuming that technology convergence will occur in open, integrated regions. The question is which model of regional integration can be considered more ‘open’: institutionalized EU or market-led Asia. Open regions will display more convergence, but this simple thesis unravels further questions such as the following. Are the regions internally open, externally open, or both? Prior studies state that Asia is regionally and globally integrated. Which combination leads to the most convergence? Which to the least social cost? While the EU propagates social protection, the results may prove the opposite for marginal countries that diverged, partly due to the euro. Is the EU internally open due to the common market and currency, but only partially open in other transmission channels? This would be a possible conclusion from this sequence of questions.

In formula, I measure labor productivity by taking the value added of manufacturing and dividing it by employment numbers. Let $P(i, k, t)$ be the value added of manufacturing m in a country i at a given time t . For a given country pair (i, j) and m at time t , the absolute log difference is defined as follows:

$$Q(i, j, m, t) = | \ln P(i, m, t) - \ln P(j, m, t) | \quad (1)$$

Where $\ln P(i, m, t)$ is the log of manufacturing m at time t in country i , $\ln P(j, m, t)$ is the log value of manufacturing m at time t in country j .

¹⁰ For instance: SALA-I-MARTIN, X. X. 1996. Regional cohesion: Evidence and theories of regional growth and convergence. *European Economic Review*, 40, 1325-1352.

Convergence is measured by the mean ($E [Q]$) of the absolute log amount differences across countries. This is for the measurement of bilateral gaps.

$$E[Q(i, j, t)] = \sum_k |Q(i, j, t)| / N \quad (2)$$

$$V[Q(i, j, t)] = \sqrt{\sum_k \{|Q(i, j, t)| - E[Q(i, j, t)]\}^2 / N} \quad (3)$$

The above in combination with the described data leads to two sets of values. Firstly, labor productivity: Its empirical roots are in the established notion that economic growth is due to increased employment or work efficiency¹¹. If the latter is the case, labor productivity supplies the explanation. In factor terms, labor productivity is driven forward by the accumulation of machinery, equipment, improved organization/ infrastructures/ human capital, and the generation of new technology.

Secondly, I add onto above results by inserting labor cost data into labor productivity values. Thus I arrive at unit labor costs. Unit labor costs show the link between productivity and the cost of labor used in generating output. If an economy shows rising unit labor costs that are higher than the rise in labor productivity, it indicates weakness in cost competitiveness. This assumption holds under the condition that no changes had occurred in the cost of capital¹².

Lastly, I consider the political economy of euro events since before its inception.

Events should be important and well-known to the normal public and global media.

¹¹ Source: Key Indicators of the Labour Market (KILM): 2001-2002, International Labour Organisation, Geneva, 2002, page 621

¹² Ibid., page 622

Table 1 Landmark dates for the euro, including German unification¹³

Fall of Berlin Wall and reunification	November 1989 and October 1990
Maastricht Treaty signed, rules for future single currency established	7 February 1992
name “ <i>euro</i> ” officially adopted	16 December 1995
Euro introduced to world financial markets as accounting currency	1 January 1999
Euro coins and banknotes enter circulation	1 January 2002
EU enlargement to Central and Eastern Europe	1 May 2004
Global Financial Crisis (Credit Crunch)	September 2008
European Sovereign Debt crisis	Late 2009

As for the Asian crisis in comparison, the IMF is a strong trademark, with a similar perceived impact as actions under the name of the euro. IMF lifeline occurrences took place roughly between the end of 1997 until the end of 2000 in most Asian countries (Barkbu et al., 2011). Hence I observe the years 1997 and 2000.

¹³ Source: Wikipedia and website of the EU (http://europa.eu/about-eu/eu-history/index_en.htm)

IV. Empirical Results

1. Main Findings

Overviews of productivity differences show that differentials are greater in the EU. I attribute this to rigid gaps in the EU, whereas Asia has had aggregate performance growth across all countries. Secondly, labor unit cost differences are significant in the EU but cannot be fully compared to Asia due to lack of data. Korea and Japan are proxies for the Asian frontier, and data reflects that Korea has had caught up rapidly.

Table 2 productivity differences

	E[Q]	V[Q]
Asia	1.55	0.45
Europe	3.70	0.37

Table 3 unit labor cost differences

	E[Q]	V[Q]
KOJA	2.69	1.70
Europe	7.06	0.51

More individual are the relative comparisons to Germany as the frontier in the EU. Greece, Ireland, Portugal and Finland show great gaps. [Figure 1](#) demonstrates there is a small symmetry in the patterns of Portugal and Finland. On the other hand, there is symmetry between Greece and Ireland. Overall there is a hint of convergence to Germany over a long period of time, with Greece and Ireland performing better. Considering that Greece begins the time series data with the highest differential from Germany, its performance has improved, albeit staying consistently behind Ireland. [Figure 2](#) is similar, this time in terms of volatility, with Ireland having had the most recent volatile high in 2003. All other countries have steadily converged since entry into the eurozone. The volatile shock in 1990 is due to German unification, since these differentials are derived in relation to volatility in Germany. Such high volatility

was possible due to individual currencies. Price and productivity shocks were reflected in the currency rate. For my purposes, this shock during German unification is an interesting contrast. Notably and perhaps worryingly, there is no discernible shock during the EU-wide unification of currency and market. On the contrary, a convergence pattern is visible. This causes

Figure 1 Bilateral to Germany (E[Q]) 1975-2007

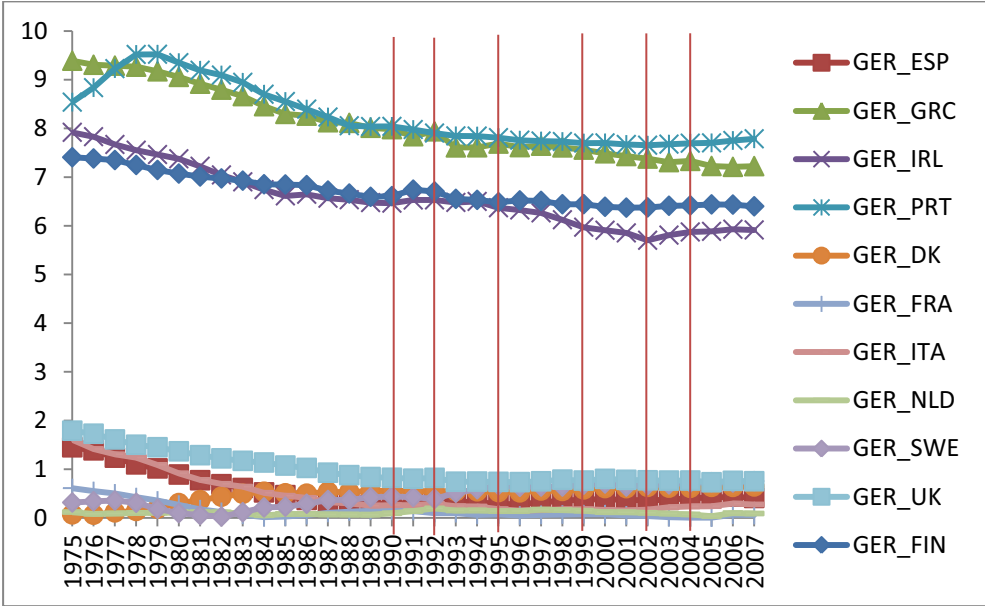
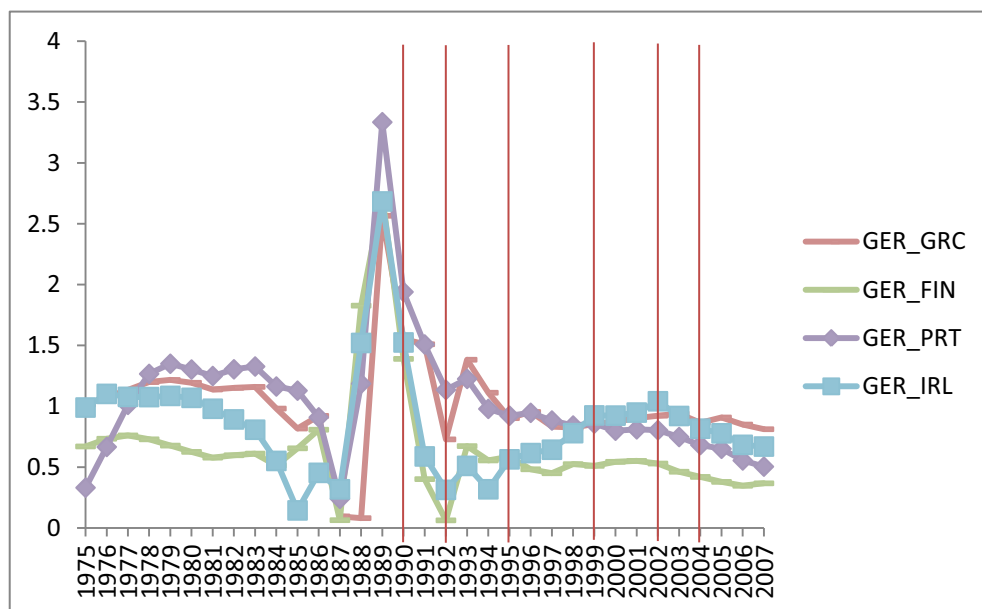


Figure 2 Bilateral to Germany (V[Q]) 1975-2007



concern regarding suppressed shocks, which would consequently have transferred into price and productivity for want of monetary and fiscal mechanisms.

In comparison, Asia ([figure 3](#)) has shown smooth and steady convergence towards Japan’s productivity levels. Interestingly, convergence occurs primarily towards Japan and cements its position as the frontier. This becomes clear by viewing the developments *vis-à-vis* Korea ([figure 4](#)). Productivity convergence towards the frontier, namely the leading productivity country in the region, seems to be a natural dynamism for competitive environments. The same applies to [figure 5 and 6](#). Convergence occurs for all countries simultaneously and more so if Japan is the frontier.

Figure 3 Asia, Bilateral to Japan (E[Q]) 1975-2004

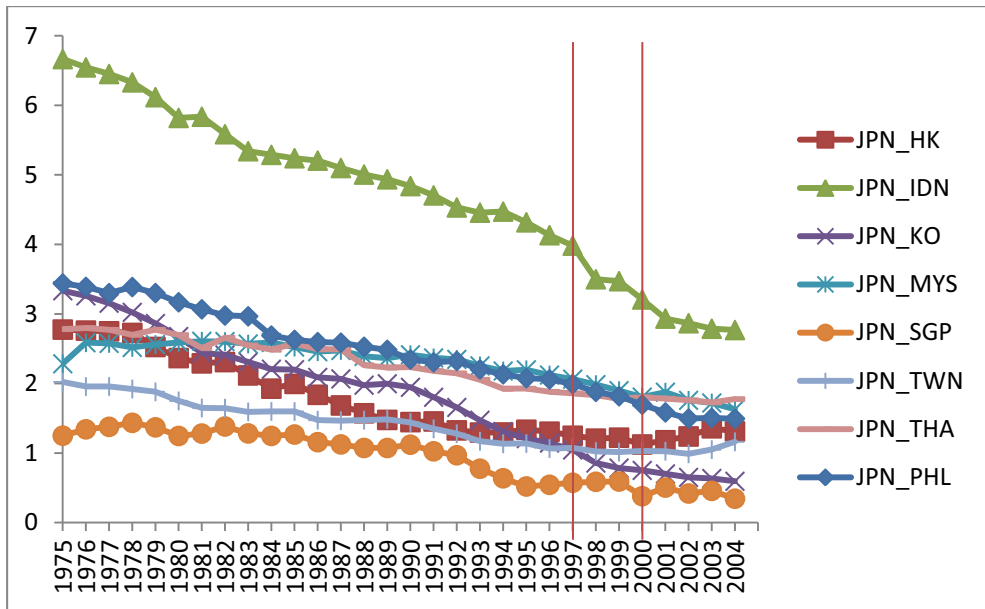


Figure 4 Asia, Bilateral to Korea (E[Q]) 1975-2005

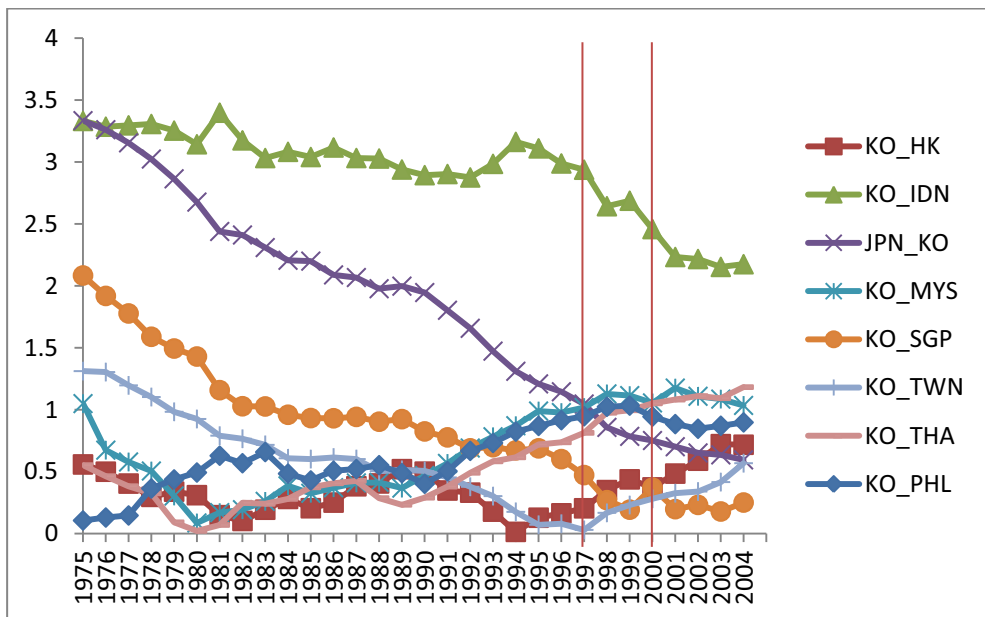


Figure 5 Asia, Bilateral to Japan (V[Q]) 1975-2005

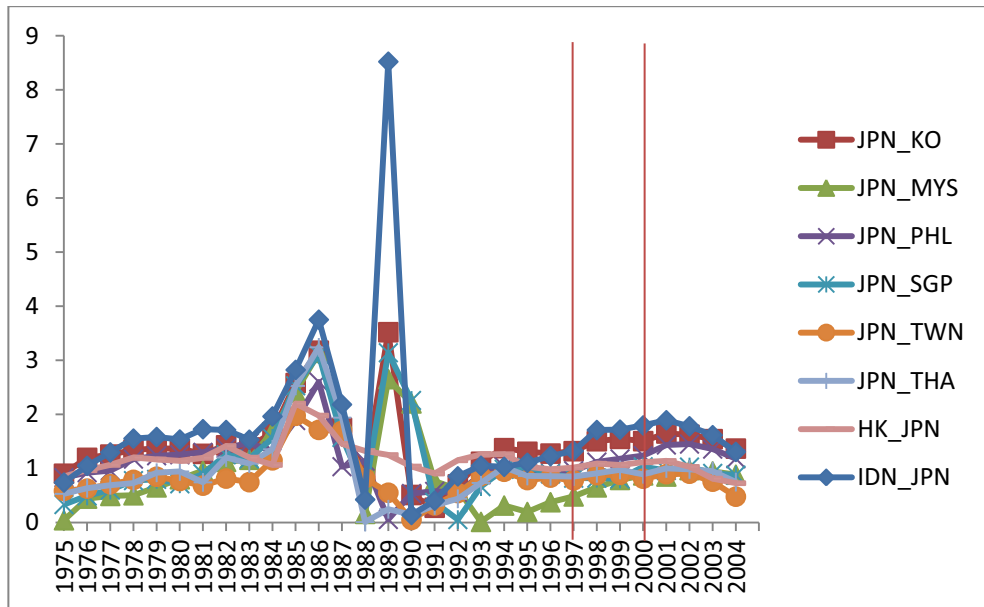
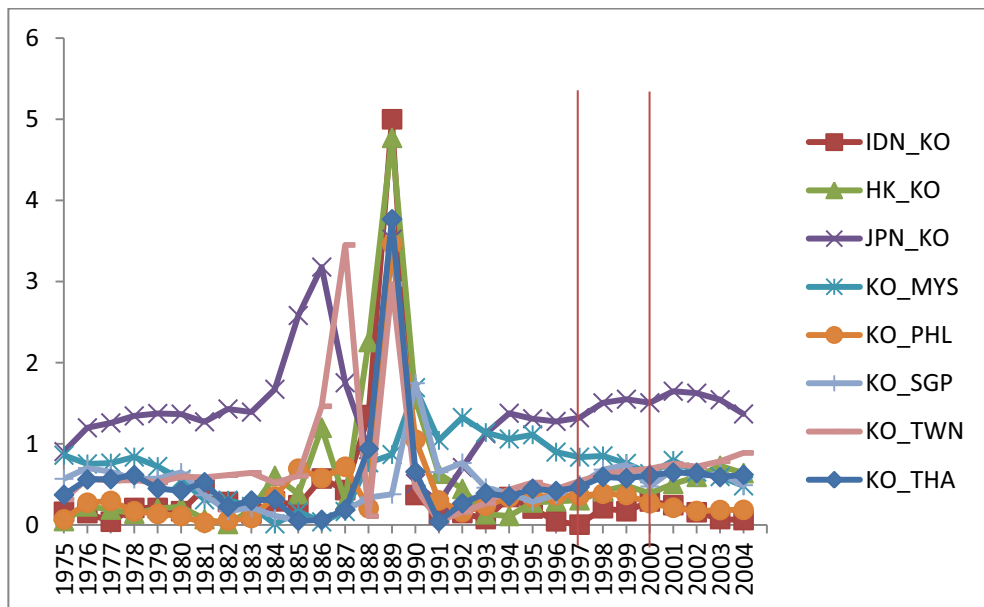


Figure 6 Asia, Bilateral to Korea (V[Q]) 1975-2005



An extreme volatility shock occurred in 1989 during the Japanese Stock Market Crash. In order to counter inflation, the Bank of Japan raised its discount rate. As a

consequence, real GDP growth slowed post-1989, prices declined, and the economy slowed as a whole. This may be evidenced at the low point around 1991, during which all Asian countries displayed very little productivity volatility *vis-à-vis* Japan. Another notable aspect is the twofold camp of reactions to the 1989 Nikkei crash. While countries like Indonesia, Korea, Singapore and Malaysia reacted with high productivity volatility, other countries did the opposite. These were the Philippines, Thailand, and Taiwan. I assume that one of the two groups was particularly vulnerable due to openness to Japan. Before the Asian crisis in 1997, all of the examined Asian countries adhered to a soft dollar peg in various degrees of strictness (Ohno, 1999). This may have played a part. However, it is important to keep in mind that the exchange rate influences labor productivity directly or indirectly. The resulting pattern is at least half dependent on Japanese developments. Equally important might be that intra-regional trade and trade with industrial countries accounted for the largest part of total trade in Asia. Japan was the key supplier of capital goods and machinery parts. So the volatility shock would have been shared by both parties Japan and bilateral country. The corresponding $E[Q]$ value depicts steady convergence without noticeable breaks throughout financial crises, underlining my assumption above. Overall, these countries are clearly interlinked by currency peg and trade, thereby affecting labor productivity. The markedly stable growth in Asia is expressed in the $E[Q]$ convergence patterns. It overshadows any volatility that exists in $V[Q]$ terms. Strong growth can withstand volatility stemming from fiscal interruptions. Even more, the Asian Financial crisis in 1997 is hardly present

throughout the results. Productivity growth is unaffected, or is at least not hurt so much as to reverse convergence.

On the other hand, back in the EU, growth is a difficult topic. Was the introduction of the eurozone a defining moment for EU productivity convergence, e.g. labor productivity growth? There was already some convergence taking place before the euro, but this pattern cannot be taken at face value. Due to anomalies in the results, caused by mutual economic thresholds before entry, a clear pattern does not distinguish even from long term data. I view the timeline after the German unification and regard the start of the eurozone in figure 7 and 8. Volatility convergence occurs but slows down convergence with it. German unification and EU unification are completely different from each other in terms of volatility outcomes. While the largest part of the shock during German unification must stem from Germany itself, EU unification seems to have been much gentler on Germany

Figure 7 Unified Germany and Eurozone, Bilateral to Germany (E[Q]) 1991-2007

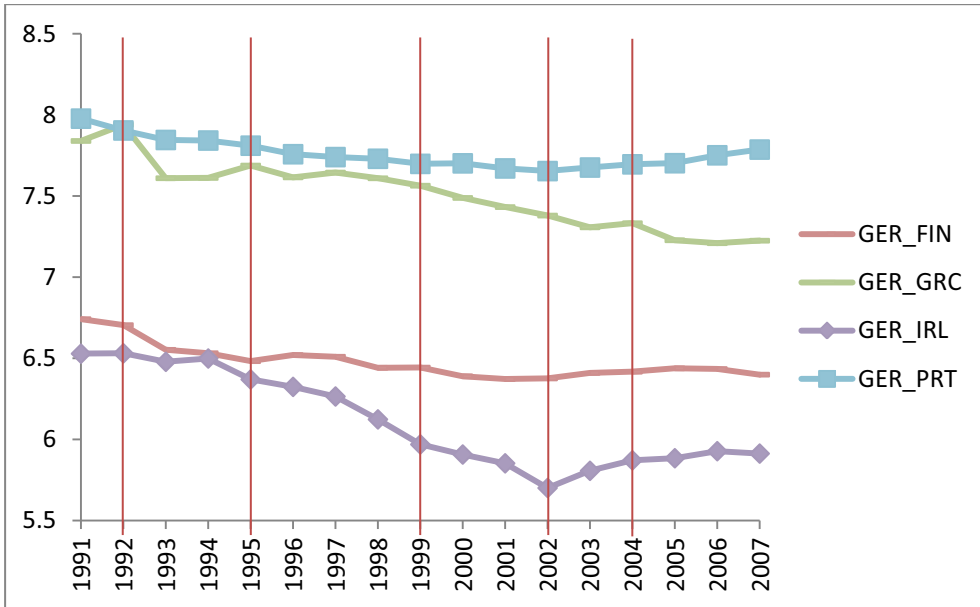
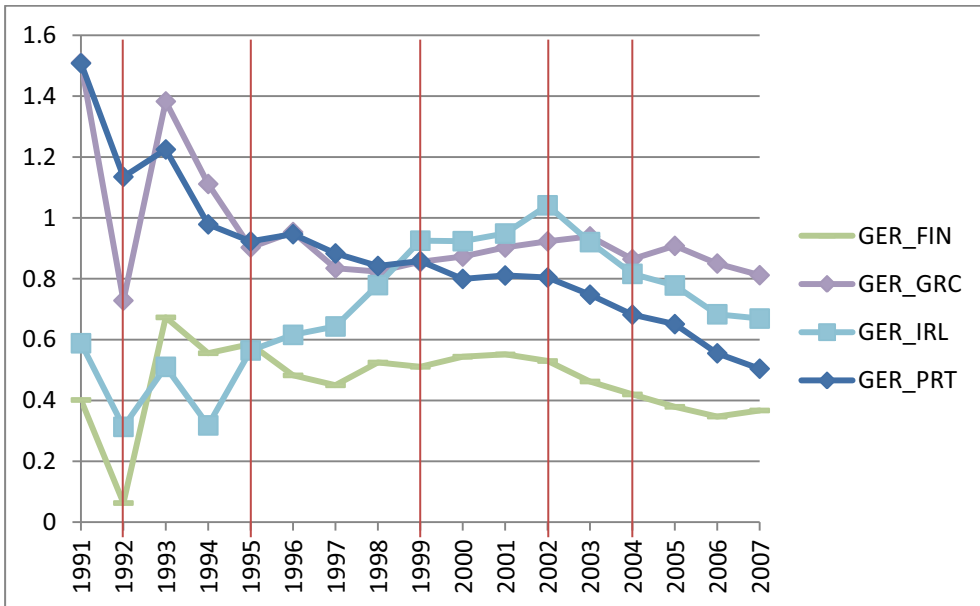


Figure 8 Unified Germany and Eurozone, Bilateral to Germany (V[Q]) 1991-2007



in comparison. Volatilities in the peripheral countries were possibly directed towards intentional convergence at the time of EU unification. Based on this, EU unification conjures a scene where Germany sets the tone, and peripheral countries do their best to follow.

Unit labor costs (ULC) encompass worker benefits provided by the firm. ULC again grasps all factors within labor compensation. The counterpart to labor compensation is not state welfare but capital cost that is borne by the firm. Then the role of the state is indirectly reflected in capital cost, since inflation mechanisms are not determined on the micro level. If capital cost were disproportionate, or if worker benefits were too generous, ULC would rise by that amount. Figure 9 and 10 show the increases for the economy as a whole. The results are most optimal if individual country results echo the graphs in figure 7 and 8. Proportional levels of labor productivity and ULC can be the commendable result of low differentials. And so, synchronized curves are the result of changes in compensation, labor, or productivity. The closer the curve approaches the x-axis, the smaller the differential to Germany and the healthier is the economic capacity. In this set of countries particularly, the lack of an offsetting mechanism via the own currency led to a subsequent increase in ULC after the euro (Lewney et al., 2012)¹⁴. They adjusted shortly after and returned to relatively smooth convergence curves.

¹⁴ The authors refer to caveats for ULC as a measure: it is influenced not only by labor cost but also by capital cost (for labor-intensive materials for manufacturing) and energy cost.

Figure 9 Trend of Bilateral ULC Convergence (E[Q]) 1991-2007

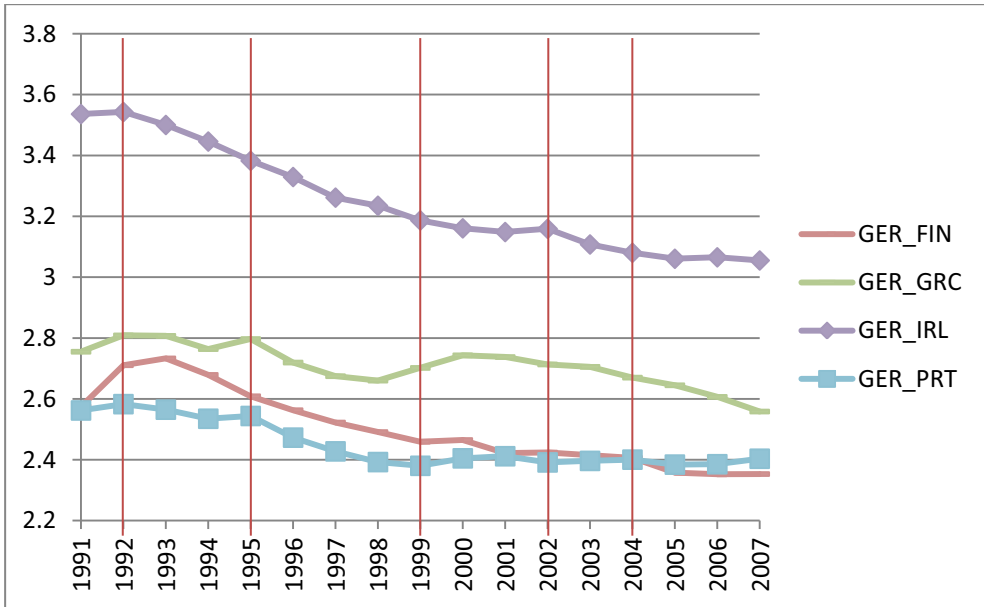
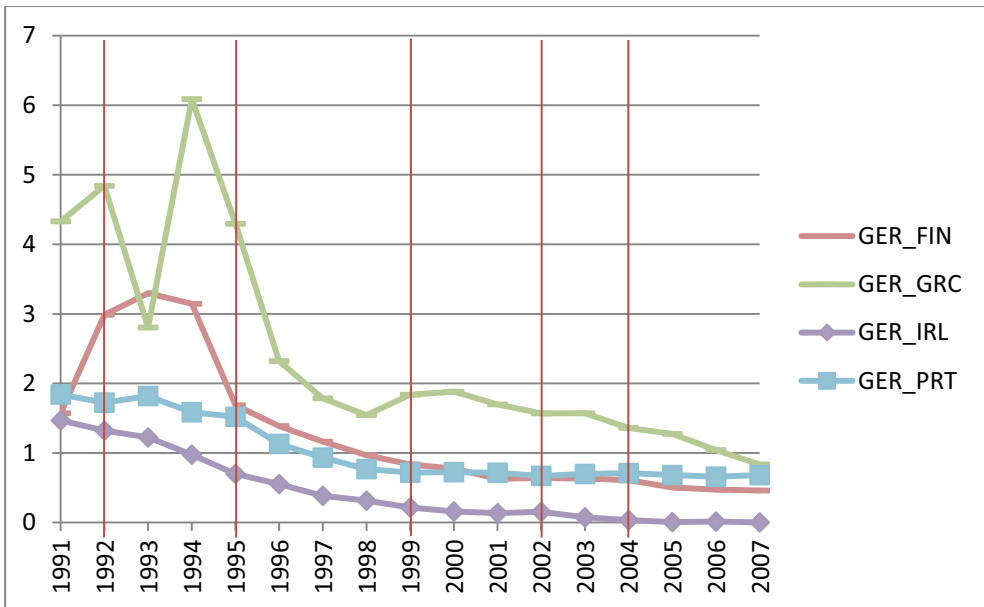


Figure 10 Trend of Bilateral ULC Convergence (V[Q]) 1991-2007



Country ULC comparisons relative to labor productivity performances yield interesting results for Portugal and Ireland. While a labor productivity dip in Ireland was recorded in 2002, overall performance is closer to Germany than its ULC. The opposite applies to Portugal, its labor productivity being far from Germany but ULC being relatively close. So the implication is that the presence of low ULC is devaluated by less than satisfactory productivity. Portugal seems to be less healthy than Ireland, whereas Ireland is a model case. Its ULC convergence corresponds to its labor productivity convergence and is easily accounted for. Portugal is the opposite of a model case. Another concern is the reversal of convergence in Ireland and Portugal after 2002. Soon after the introduction of the euro, labor productivity seems to have cancelled out some of its prior development. Since labor productivity is composed of value added and employment, one of either is at stake. A possible culprit is inflation. Greece and Finland present no new surprises in their ULC. Overall, ULC in this set of countries is falling. A fall in ULC represents two possible options depending on their labor productivity. If ULC declines together with labor productivity (Ireland, Portugal, and Greece) then an overall problem of fiscal management and debt lies near. If ULC declines but labor productivity changes little (Finland) then some fiscal changes related to labor can be suspected. Ireland and Portugal share a root of the problem, but their structures create contrasting symptoms. I corroborate this hypothesis via absolute ULC comparisons in [figure 11 and 12](#), and absolute ULC per capita in [figure 13 and 14](#). The former two graphs show the relative sizes of ULC and thus labor compensation packages for the manufacturing sector. Since 1975, steady growth or steady decline is recorded in Asia, as well as little convergence except for Korea.

Figure 11 Asia, ULC developments (absolute log)

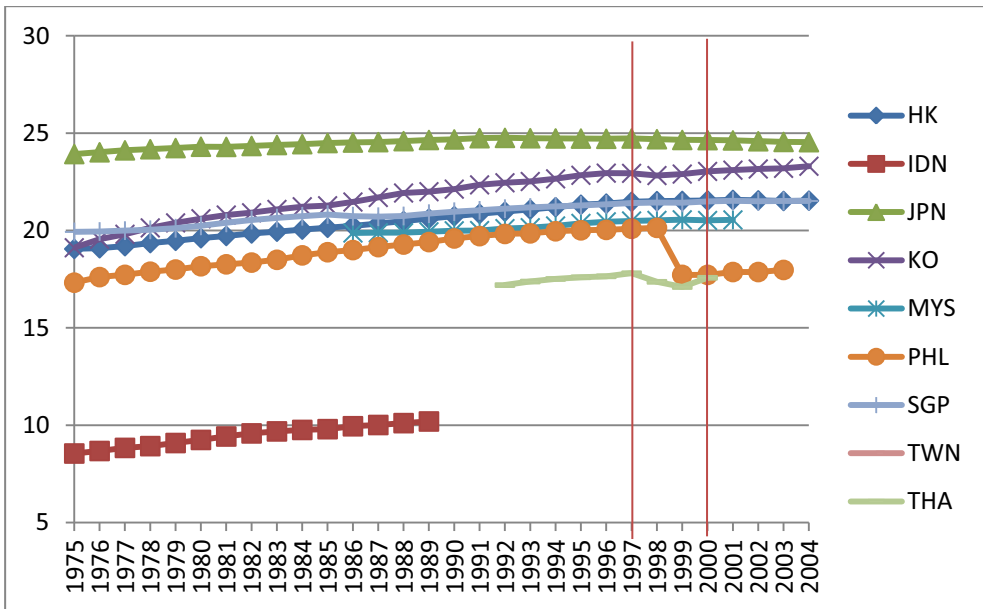


Figure 12 EU, ULC developments (absolute log)

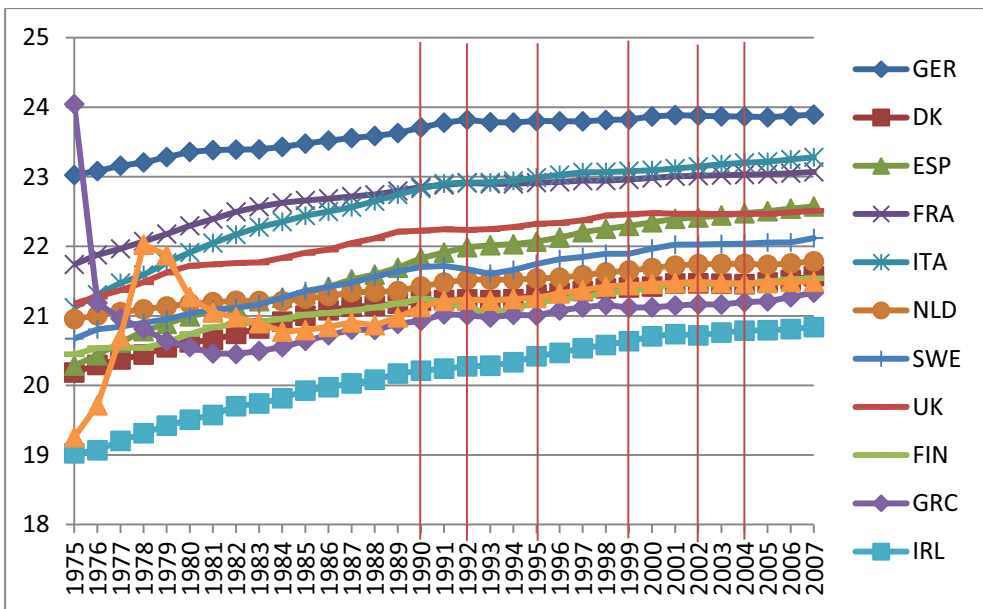


Figure 13 ULC per capita labor force (ASIA)

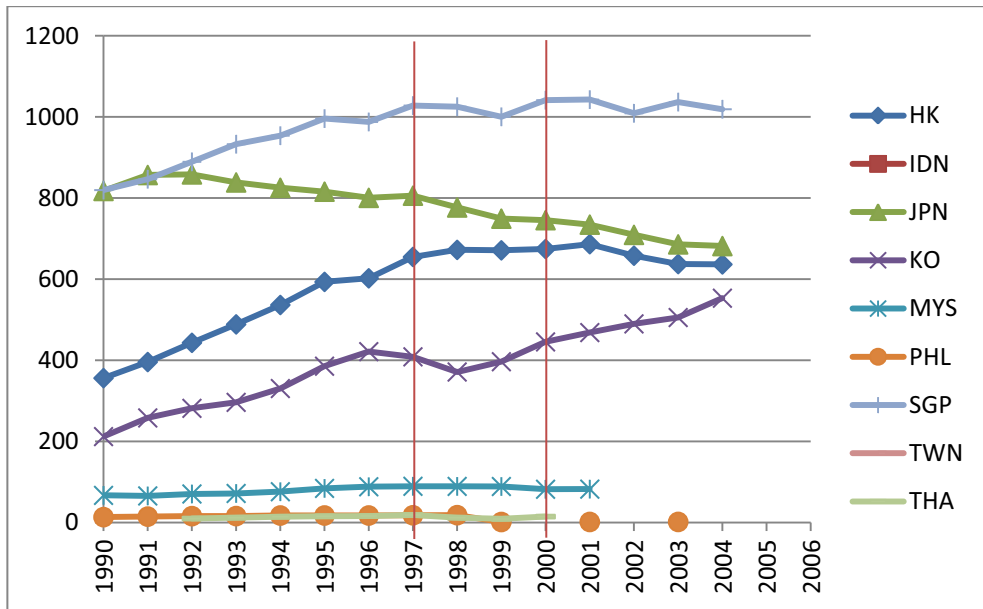
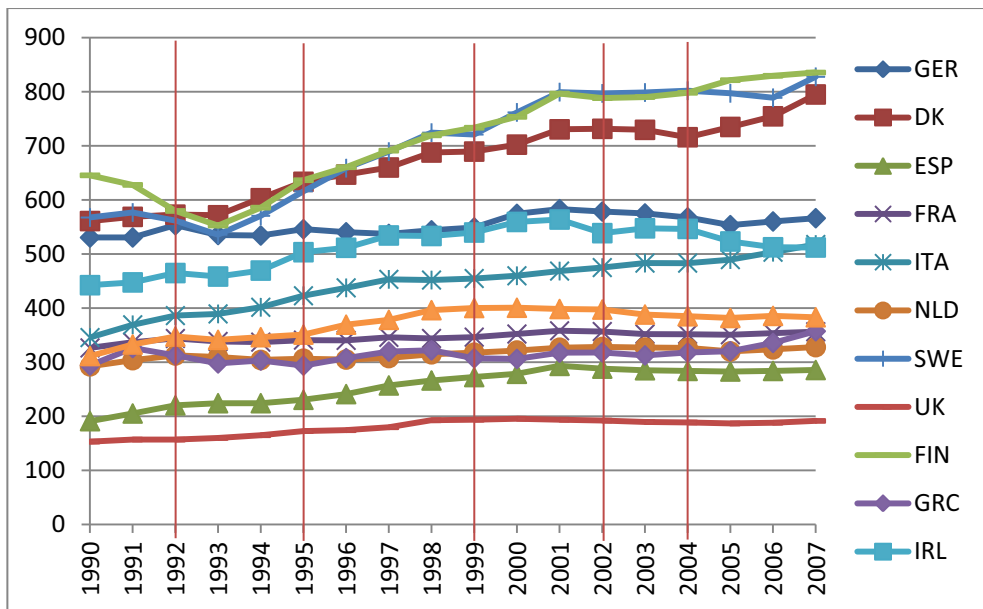


Figure 14 ULC per capita labor force (EU)



The EU shows steady growth, but only little convergence and a steady gap that seems unbridgeable. Taking the manufacturing sector as a meter for health due to its significance for an economy, the steady growth in EU countries is ambivalent. In regards to regional monetary and economic integration in 1999, the ULC indicator indeed signals turbulence. Imbalances in ULC do not create unforeseen results, but disclose existing barriers to growth. The latter two graphs on per capita labor force scale shed more light on labor environment. Asian growth curves after 1990 imply steady growth in productivity as well as employment, except for the Philippines, Indonesia and Thailand. The labor force population accounts for the total including manufacturing. In the same way, EU growth curves hold information regarding individual manufacturing sectors. Ireland, Portugal, Finland and Greece remain almost immobile on the lowest level among the EU. Denmark and Sweden arguably display not merely a strong manufacturing sector, but a high share of welfare in labor compensation. This is a characteristic of welfare. While national welfare schemes implement a standard that spans across sectors, sectoral productivity weaknesses are limited to themselves. Growth or fall of compensation is hard to discern, especially if inflation had been present and let real prices fluctuate. The requirement is to differentiate compensation characteristics from falling manufacturing productivity.

I elaborate on some possible caveats. It is indeed possible that compensation varies depending on the sector, but this effect is arguably weaker than a fundamental lack of productivity. In the case of the four most lagging countries in the EU, this assumption is likely to hold true if productivity differentials are just too prominent. Another

counter-argument can be that manufacturing is only one segment of the national economy and cannot speak for the whole. I discuss this and other arguments in the next section.

2. Discussions

The eurozone is obviously riddled with productivity issues, but why? The Balassa-Samuelson model predicts that tradable goods entail price equalization across the integrated region. All countries trade with each other, but some do so more actively than others. Low-performing manufacturing sectors are tantamount to relatively low export¹⁵. Low-exporting countries absorb equalization effects and retain them in the form of inflation. They are doubly hit because their gains from export are comparatively low. Productivity cannot be built instantly and needs guidance. A better composition of export baskets is a good target. I showed that productivity problems are defined by non-convergence towards Germany. This means that the source and goal of productivity shall also converge towards Germany. However, it is impossible to duplicate Germany or compete with Germany in its strong sectors. So the best recommendation is to target emerging industries. E.g. biotechnology or renewable energies are relatively unsaturated and promise future profitability. Not competing, but complementing with Germany should be the conclusion of viewing the common market as one entity. Aggregate divergence is caused by low levels, low growth, and the export basket, but reform should start from the reverse order.

¹⁵ Since resource-based export goods such as agriculture cannot grow quickly, whereas productivity has the potential to do so. Exceptions by scale are i.e. olive oil for Greece.

Did the eurozone anticipate the needs of weaker countries? It is hard to dissect the language of political economy apart from intentions, but it remains true that economic volatility was not sufficiently predicted. The recent eurozone crisis that emerged in 2009 is partly a government debt crisis. Liquidity traps worsen if the troubled country is part of a monetary union (De Grauwe and Ji, 2012a). Higher spreads of risk stem from investor expectations and self-fulfilling prophecies. Such external compressions turn out to be burdensome for any party inside the union. Output declines in the countries that are hit. Once in this position, the impetus for change must originate from the union. It must make up for missed opportunities of the past. The shortcomings are as follows. Productivity differentials have been very wide since a long time before the eurozone. ULC converged proportionally to productivity. Debt and risk result naturally from these very large productivity differentials. Their effective containment should be the benefit of union membership and monetary stability. The true risk in the long-term view is, therefore, low productivity. Austerity measures might work best if they are directed to rechanneling for productivity, technology, and target basket reshuffling.

Throughout empirical analysis in this paper, I have referred to Asia for good measure. Due to the absence of monetary union, fiscal mechanisms in Asia are free of identical constraints. Exchange rates are reasonably adjusted in order to avoid payments crises (De Grauwe, 2012a). Much published knowledge puts forth that East Asia fulfills OCA criteria¹⁶ just as well as the EU (De Grauwe, 2012b). Are Asian developments a

¹⁶ of trade, co-movement and labor flexibility

parallel universe of a Europe without monetary union?

To discuss the question, I return to ULC empirical results. ULC developments in Asia are divergent in per capita comparison. This is a notable difference to the EU where no country really diverges. Divergences in Asia are not exceedingly large. Rising ULC despite of productivity convergence seem to stem from welfare gains, since the data can be seen to encompass some welfare compensations. The per capita frontier is not Japan but Singapore. Higher welfare may now be the goal in formerly cheap-labor Asia. From this I draw two assumptions. First, the country with highest productivity does not influence wage setting in the way Germany does in the EU. Second, ULC increases are generally backed by productivity growth. Less political and social interaction may be the reason for the former. Widespread export-orientation, steady growth, and investment may catalyze the latter. The single greatest difference between Asia and EU are the disparities in productivity convergence. It may be bold to claim that the monetary union is a second rate problem in comparison to gaping clefts in fundamentals. If true, it leaves room to subordinate fiscal traps and public debt underneath an industrial agenda. Productivity divergence was a problem that existed even before monetary union. In Asia, individual political and social externalities are relatively harmless for each other¹⁷. If Asia were a monetary union, the hypothetical question would be whether converging productivities would cede to the same problems, *ergo* imbalances. The answer is likely to be much less severe, and

¹⁷ North Korea excluded, depending on how to interpret the situation.

shifts weight to the significance of productivity growth in the EU, adding contextual flesh to future strategies.

V. Reasons for Divergence

I would like to analyze some usual suspects in this section. Above, I have glanced at labor productivity and ULC divergence effects that may be caused by the euro mechanism. However, most of the critique against peripheral macroeconomic mismanagement specifically addresses domestic inflation, prices, and labor. Hence I would like to examine these factors for their domestic share of responsibility versus the burden of proof for EU-level responsibility.

1. Inflation

There are dangerous divergences of unit labor costs between Germany and Southern Europe. There is also a correlation to stubborn inflation differentials. This inflation persistence can have various causes. I focus on inflation as the root cause. Wage levels throughout the EU follow the path of Germany as the central model (Ramskogler, 2012). Upwards pressure on wage “appears to be caused by stubborn inflation differentials between these areas”. Inflation may contribute to labor compensation and ULC upwards pressure. Any upwards pressure is potentially dangerous if not accompanied by actual productivity increase. I distinguish between pressure and increase. Pressure takes place when sole ULC convergence occurs without the backing of productivity convergence¹⁸.

My empirical results suggest convergence of labor compensation towards German

¹⁸ Unemployment can be a further factor. It is not elaborated here. I view it as a consequence of inflation for the purpose of my paper.

levels. They are however accompanied by some labor productivity convergence (except for Finland and Portugal). The countries Ireland and Greece show more labor productivity convergence than current political controversy might claim. If fiscal dead-ends are obstinate in Ireland and Greece, some other factor must be at work. Labor productivity is the result of employee output. It can be improved by technological advances, high demand, and further factors. Fiscal problems lead to inflation, which causes drops in investment and demand. If fiscal emergencies and high debt (being the symptom) rang bells despite prior productivity convergence to Germany, other root problems must exist.

Wages and welfare are captured in ULC. I cross them out from the list of root problems. This is justified if ULC convergence is supported by productivity convergence¹⁹. What if productivity convergence is absent while ULC does converge? This is a warning sign, since inflation will intensify due to lack of competitiveness. Extensive safety nets aggravate real wages and inflation (Campolmi and Faia, 2011). I rule out this ‘sin’ for Ireland and Greece, but not for Finland and Portugal. It is true that competitiveness cannot be heterogeneous across a large region. Inflation differentials present an important adjustment mechanism in the eurozone. It gets risky if inflation differentials are caused by rigid productivity problems. Even with labor productivity convergence, inflation is an independent problem which hinders further convergence. Some inflation is necessary in order to balance the eurozone, but not if inflation is continuously pooled in the countries that have the lowest productivity in

¹⁹ The effect of suppressed wages with the result of artificial ULC convergence is discussed in the below section on labor.

the region.

Too much inflationary pressure on prices in peripheral countries will block productivity growth. I estimate the real effect of the euro on prices in order to evaluate the impact on the real economy. The real economy is linked to low ULC because it offers a measure for inflation. It is also linked to low productivity because inflation tends to freeze economic activity. Peripheral countries in the EU start out with more inflation: Countries with initially low prices experience price convergence via “inflation catch-up” (Rogers, 2002). Hence, a closer look at the effect of inflationary euro effects on the prices in peripheral countries may offer some insight into productivity growth barriers.

2. Prices

Price level convergence indicates exchange rate appreciation if there is no monetary union. If price levels do not converge, the real exchange rate is suppressed in order to retain competitiveness (Égert, 2011). This particular motivation is weak a country has weak competitiveness in tradable goods. Manufacturing sectors with low productivity levels apply here. Lagging countries might display some price level convergence, but the role of tradable goods may be smaller there. My chosen indicators are price levels and productivity levels. Inflation based on price levels is empirically similar to inflation based on productivity levels (Sinn and Reutter, 2001). By assuming that inflation stems from productivity gaps and diverging home goods prices, I borrow from the Balassa-Samuelson model and show some price convergence results in [table](#)

4 and 5.

The trends are deduced from average prices of non-tradable goods²⁰. During the ten years between euro introduction and the EU Financial Crisis, volatility to Germany was kept low in most countries while divergence to Germany rose slightly. Only Greece and Spain stand out with opposite patterns. 2009 was the next critical point and saw stronger convergence to Germany, except for Spain which diverged and returned to 2000 levels. 2009 is also a high point in volatility since introduction of the euro.

Table 4 E[Q] of price convergence trends²¹

	1990*	1995	2000**	2005	2009***	2010	2011
GER_FIN	4.2	4.8	3.7	4.1	3.2	2.3	4.1
GER_GRC	1.5	5.0	4.4	4.4	1.6	2.9	4.7
GER_IRL	1.5	5.0	3.7	3.9	2.6	1.4	4.4
GER_PRT	1.5	4.6	3.9	4.4	3.0	4.4	5.2
GER_ESP	1.4	4.4	4.0	3.5	4.0	3.8	4.6

Table 5 V[Q] of price convergence trends

	1990*	1995	2000**	2005	2009***	2010	2011
GER_FIN	1.0	3.2	2.6	1.5	3.1	3.4	1.3
GER_GRC	0.6	3.3	1.7	2.0	3.8	3.7	2.1
GER_IRL	2.8	3.6	2.8	2.5	3.4	3.6	1.5
GER_PRT	2.8	2.5	2.7	-3.7	3.4	0.2	3.9
GER_ESP	0.6	2.6	-0.8	2.2	0.3	1.2	3.3

²⁰ detailed list and data source in the Appendix

²¹ Years in bold approximately denote important events. 1990*: German unification; 2000**: EU unification; 2009***: EU Financial Crisis

While shocks are unavoidable in any EU country during points in time, obviously there must be additional impact in low productivity countries. Germany inhabits a special place because it is the productivity leader, and due to the possibility that lagging countries orientate themselves towards Germany. Inflation could be an expression of it, alongside more tacit indicators such as policy and politics. In times of crises after 2009, these countries show some of the lowest divergence to Germany hitherto. It seems to be effective for reducing volatility relative to Germany, except in Portugal and Spain.

The individual patterns are too idiosyncratic and underlie many factors which cannot be entirely illuminated. Certainly, the above results seem not very supportive of the Balassa-Samuelson hypothesis. The reason is that the sample duration is comparatively short- since the birth of the euro until now- and a vast crisis visited very soon. An additional possibility is proposed by MacDonald and Wójcik (2008), who find centralized monetary policy failing to respond to productivity growth in lagging countries, thereby adding to inflation. Inflation worsens price dispersion, and even more so in less integrated countries (Becker and Nautz, 2012). The peripheral countries tick all of the above boxes. Their search costs consist of the attempt to align with Germany. Such stabilization efforts do not always bode well for the real economy, as price repercussions in 2011 in some countries show. If not within prices, repercussions are likely to influence labor and productivity rates. According to standing theory, convergence could either transmit through tradable goods or productivity growth (Rogers, 2007). The latter process is slow and gradual, especially

in lagging countries.

In contrast to the above stands the time before EU integration. German reunification in 1990 brought little impact on the price levels and volatility in these countries. These became much more irregular during the adjusting phases before the union. It may be telling that differentials in the most recent convergence data of 2011 are reminiscent of the pre-euro adjusting process around 1995. The difference is that public debt is mounting today in Greece and defies comparison. Volatility in the most recent data offers marginal hope. Only Greece and Spain show volatility growth of around three to four times compared to 1990. This is cause for concern if similarity to Germany is a signal of health. Real events confirm that German indicators are the prime yardstick in this integrated EU. Divergences from it imply dangerous consequences. Inherent weaknesses are the insurmountable gap in productivity levels, which cannot be fixed in short time. If it provides the cause for incessant inflation and subsequent domestic debt, it seems overly strict to penalize these countries for their backward productivity strategies. The union may mean that development economics are needed within its very own borders. Ironically, the branch of development economics also concerns itself with the futile potential of financial transfers and is ever looking for ways to initiate self-made productivity. In the same way, potentials of peripheral countries must be identified. The divide among EU members is indeed very deep throughout, as I show below.

Productivity differentials and volatility are highest in peripheral countries, and not only *vis-à-vis* Germany. Relative comparisons between all EU countries make this

clear (Tables 6 and 7, figures 16 and 17). On the other hand, further high-debt countries with allegedly bad macroeconomic management are excluded from the peripheral divide. This state may be reinforced by prices, which are in turn caused by inflationary effects and their management. However, as I have argued above, inflationary effects cannot be contained via monetary instruments in this case. Instead, prices act as a buffer, and this seems to be a problem that joins or cements the problem of absent productivity buffers.

3. Labor

Labor is another factor likely to influence productivity and ULC data. Its overprotection is, for this reason, an oft-used criticism. High employment protection can increase the persistence of inflation (Morsy and Jaumotte, 2012). Labor market institutions in troubled countries contribute to inflation. In some EU countries, the gap between nominal wage growth and productivity growth is large (Peeters and Den Reijer, 2012).

Table 6 Labor productivity mean differentials, EU and Asia

EU	GER	DK	ESP	FRA	ITA	NLD	SWE	UK	FIN	GRC	IRL	PRT
DK	0.45		1.03	0.52	0.98	0.56	0.15	1.49	7.17	8.57	7.04	8.71
ESP	0.57	1.03		0.50	0.05	0.47	0.88	0.47	6.14	7.54	6.02	7.68
FRA	0.07	0.52	0.50		0.46	0.04	0.38	0.97	6.65	8.05	6.52	8.18
ITA	0.53	0.98	0.05	0.46		0.42	0.83	0.51	6.19	7.59	6.06	7.73
NLD	0.11	0.56	0.47	0.04	0.42		0.41	0.93	6.61	8.01	6.48	8.15
SWE	0.31	0.15	0.88	0.38	0.83	0.41		1.35	7.02	8.42	6.90	8.56
UK	1.04	1.49	0.47	0.97	0.51	0.93	1.35		5.67	7.08	5.55	7.21
FIN	6.72	7.17	6.14	6.65	6.19	6.61	7.02	5.67		1.40	0.12	1.54
GRC	8.12	8.57	7.54	8.05	7.59	8.01	8.42	7.08	1.40		1.52	0.14
IRL	6.59	7.04	6.02	6.52	6.06	6.48	6.90	5.55	0.12	1.52		1.66

ASIA	HK	IDN	JPN	KO	MYS	PHL	SGP	TWN
IDN	3.04		4.82	2.94	2.56	2.34	3.86	3.38
JPN	1.78	4.82		1.87	2.25	2.48	0.96	1.43
KO	0.09	2.94	1.87		0.38	0.61	0.91	0.44
MYS	0.47	2.56	2.25	0.38		0.23	1.29	0.82
PHL	0.70	2.34	2.48	0.61	0.23		1.52	1.05
SGP	0.82	3.86	0.96	0.91	1.29	1.52		0.47
TWN	0.35	3.38	1.43	0.44	0.82	1.05	0.47	
THA	0.48	2.55	2.26	0.39	0.01	0.21	1.31	0.83

Notes on abbreviations: GER=Germany, DK=Denmark, ESP=Spain, FRA=France, ITA=Italy, NLD=Netherlands, SWE=Sweden, UK=United Kingdom, FIN=Finland, GRC=Greece, IRL=Ireland, PRT=Portugal

HK=Hong Kong, IDN=Indonesia, JPN=Japan, KO=Korea, MYS=Malaysia, PHL=Philippines, SGP=Singapore, TWN=Taiwan

Table 7 Labor productivity standard deviations, EU and Asia

EU	DEW	DK	ESP	FRA	ITA	NLD	SWE	UK	FIN	GRC	IRL	PRT
DK	0.26		0.40	0.16	0.45	0.37	0.36	0.39	0.24	0.73	0.46	0.77
ESP	0.65	0.40		0.23	0.06	0.77	0.04	0.01	0.15	0.33	0.06	0.37
FRA	0.42	0.16	0.23		0.29	0.53	0.19	0.22	0.08	0.56	0.29	0.61
ITA	0.71	0.45	0.06	0.29		0.82	0.10	0.07	0.21	0.27	0.00	0.32
NLD	0.11	0.37	0.77	0.53	0.82		0.73	0.76	0.61	1.10	0.83	1.14
SWE	0.62	0.36	0.04	0.19	0.10	0.73		0.03	0.11	0.37	0.10	0.41
UK	0.64	0.39	0.01	0.22	0.07	0.76	0.03		0.14	0.34	0.07	0.39
FIN	0.50	0.24	0.15	0.08	0.21	0.61	0.11	0.14		0.48	0.21	0.53
GRC	0.98	0.73	0.33	0.56	0.27	1.10	0.37	0.34	0.48		0.27	0.04
IRL	0.71	0.46	0.06	0.29	0.00	0.83	0.10	0.07	0.21	0.27		0.31

ASIA	HK	IDN	JPN	KO	MYS	PHL	SGP	TWN
IDN	0.04		1.12	0.00	0.62	0.07	0.45	0.49
JPN	1.16	1.12		1.12	0.50	1.04	0.67	0.63
KO	0.04	0.00	1.12		0.62	0.07	0.45	0.49
MYS	0.66	0.62	0.50	0.62		0.55	0.17	0.13
PHL	0.11	0.07	1.04	0.07	0.55		0.38	0.41
SGP	0.49	0.45	0.67	0.45	0.17	0.38		0.04
TWN	0.53	0.49	0.63	0.49	0.13	0.41	0.04	
THA	0.22	0.18	0.94	0.18	0.44	0.11	0.27	0.31

Figure 15 Trends of Bilateral Productivity Convergence (E[Q]) 1975-2005, EU and Asia

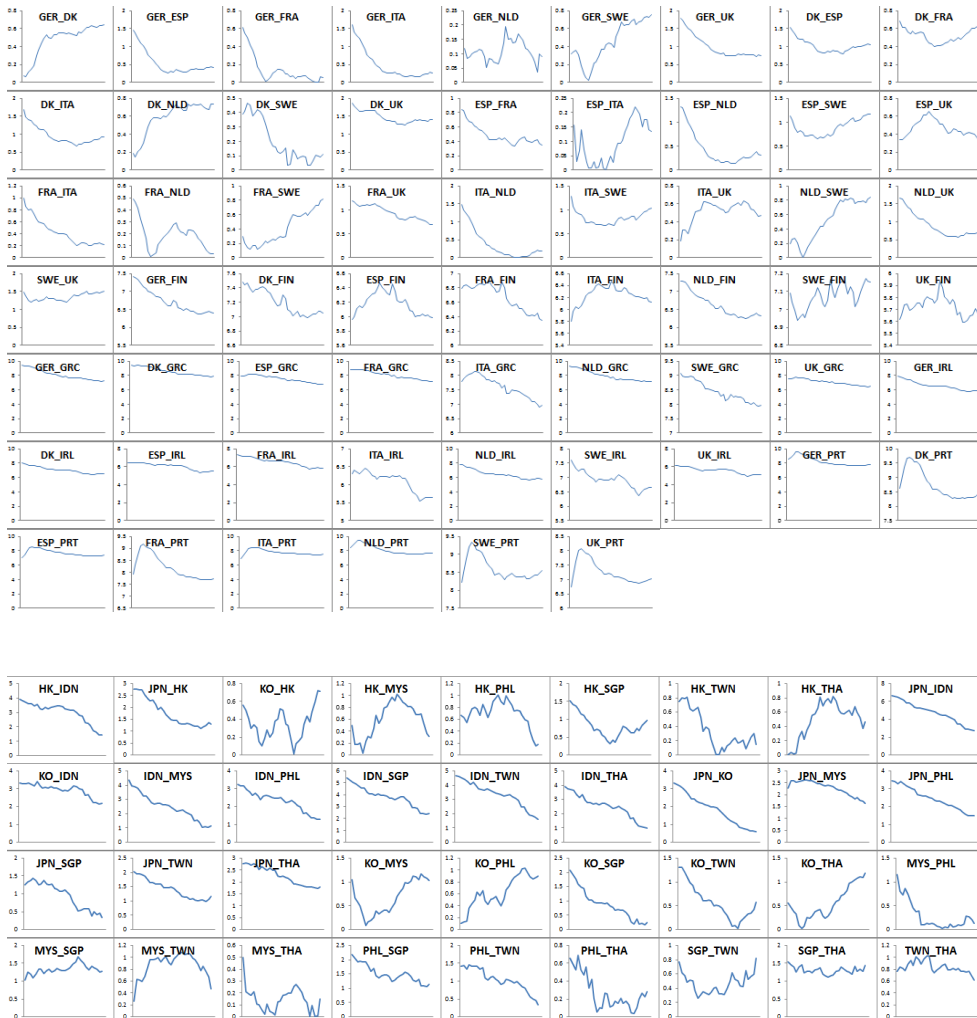
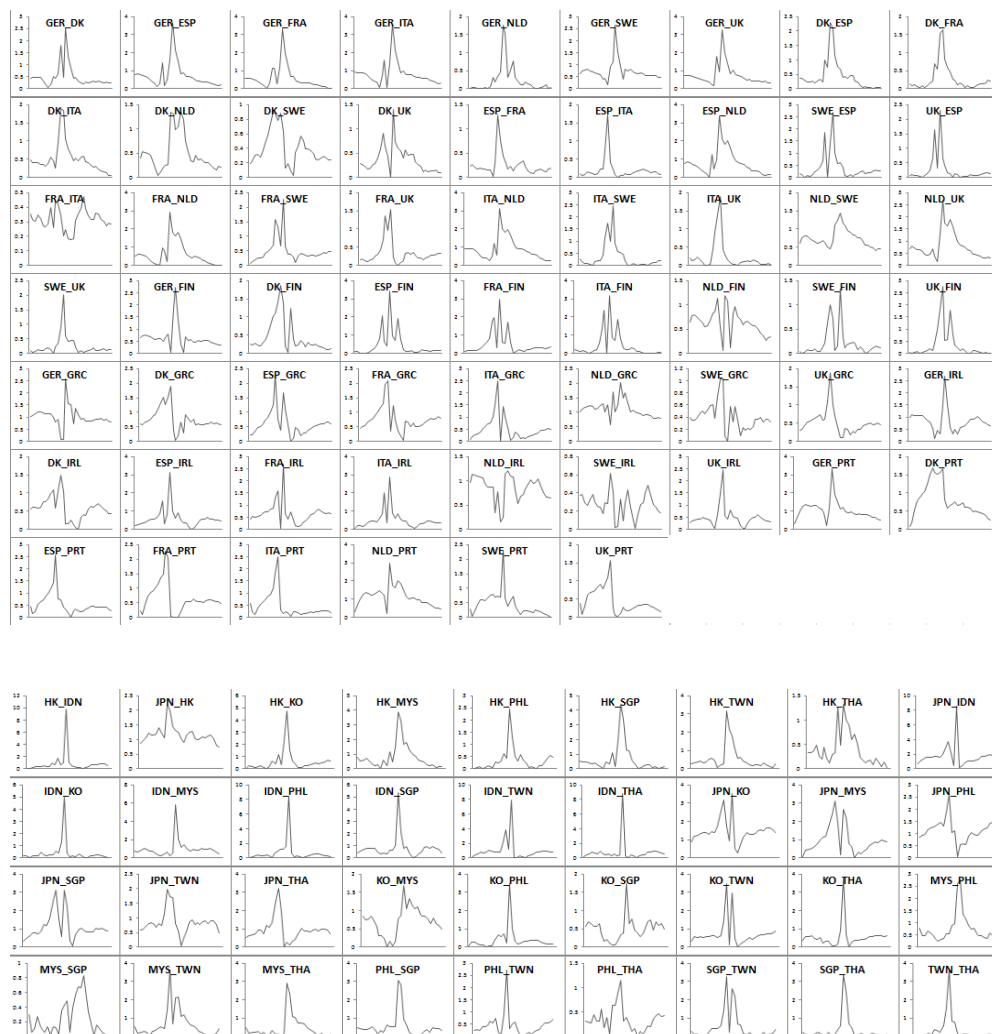


Figure 16 Trends of Bilateral Productivity Convergence (V[Q]) 1975-2007, EU and Asia



Price inflation and unemployment reductions put upward pressure on wage growth. These results confirm comparisons between Greece, Ireland, Portugal, and Spain with Germany as the determinant. I conclude that convergence takes place in wage bargaining, but less so in productivity and competitiveness. This is the effect of an

integrated region. It is especially true in Europe, since it is formally integrated and emphasizes social welfare more than Asia. The problem is when convergence stems from rent-seeking behavior rather than investment.

On the other hand, flexible labor in a fiscally austere environment leads to contraction (Izurieta, 2012). The world economy is wage-led, which means that wage signals act as Keynesian stimuli. This argument claims that wage-cutting in one country leads to negative employment effects in the rest of the world. It is an argument fitting for a global framework. Does it apply equally to an integrated region? The authors offer a semi-concise answer. Fact is that the eurozone is fiscally austere, but is not free from shared repercussions due to its unified currency. This can be understood in the vein of mercantilism. Wage cutting compresses domestic demand and creates artificial productivity at best, lowering unit labor cost in an unhealthy manner. Caldenteu and Vernengo (2012) state that the EU debt crisis is the result of core eurozone countries' beggar-thy-neighbor policies which aim at export increases. Such a stance emanates from countries that possess competitive export industries to start with. Countries with strong manufacturing industries, if led by mercantilist motives within the Union, can impede wages, demand and technology in weaker countries. Disequilibria in the periphery are the outcome. Within an integrated economy with a unified currency, such actions can only lead to crisis due to unbalanced debt. Then, are productivity problems the cause or the consequence of labor market structures? The safest stipulation is that both are interlinked. They are also barometers of each other's health. Productivity should not be sacrificed for the sake of labor. It would create a

deterioration that is irreversible by even monetary policy. Large fiscal policies connect to equally large social costs in an integrated region, as we witness in current events.

VI. Conclusion

I have reviewed the factors and barriers of productivity convergence in an incompletely integrated region. To check the effect of political economy, I put empirical results in relation to important euro events. As it is, I approached the data from a more forgiving angle for peripheral countries. Thus, I examined the integrated region for effects that entail monetary and financial traps in peripheral countries, to the extent that they reinforce stalled growth in the real economy. My aim was to investigate popular arguments that critique the lack of macroeconomic prudence and economic-social path dependencies. If the euro has had considerable effects on productivity divergence, then the monetary and financial integration carries part of the failure, depending on the nature of effects.

My observations for the EU offer grounds for illustrating that this may be partly true. A central assumption must be that Germany, as the productivity frontier, approximates the style of euro monetary policy most closely. In turn, peripheral countries that lack in relative productivity yield damage from the same monetary policy, which is expressed in the form of inflationary pressure. This is also a testament to the well-known heterogeneity between EU member countries. However, my contribution to this established fact is the correlation between euro-related monetary traps and national productivity divergences and volatilities alike. I thus emphasized the impact of the euro in different domestic real economies and time conditions, with a focus on peripheral economies with low relative productivity.

Additionally, I made a point to underline the special role of EU political economy. While economic fundamentals in peripheral countries have been relatively weak from the start, the incompletely integrated region added another burden. According to the EU's intricate design, a web of institutions filled the void of a political union instead. Thus, peripheral countries are marginally blocked by the double trap of monetary maladjustment and fiscal limitation. If financial crisis joins this constellation, large extents of vulnerability are the result. I have explained this via the productivity measure because the relevant real economy indicators and trends are included therein. Also, the robustness to brace financial crises can be predicted to some extent from these data, which enables also the benefit of hindsight. Lastly, via labor unit cost results, national changes in welfare arrangements can be interpreted, which adds to my array of findings. Based on the above, I conclude that the EU political economy is inherently harmful for productivity convergence in peripheral countries, but has a comparatively greater effect on labor arrangements in the same countries. During financial crisis, the EU political economy is especially toxic, because the lack of a political union and domestic soundness deeply influences financial markets. This unique presence of political economy in the EU, and its effect on the real economy, is one of the lesser studied topics in the field.

Reinforcing my approach, I contrasted the EU-specific economy to the Asian regional economy, where there is no monetary union nor political economy but rather an integration based on competitive and complementary production networks. Such comparative results further suggest that the eurozone inherently hinders productivity

growth in peripheral countries. If this is an economic problem caused by institutional imbalance, the current working design of the EU calls for urgent revision.

On a more hopeful note, real assets in form of productive capacity do converge, albeit very slowly, still steadily over time. Although being small trends, they seem to withstand shocks from the euro. Existing convergence trends of productivity leave a trace of hope: while stability and liquidity can be offered by the union, the EU requires balanced real assets, the source of which is productivity growth. In economic reason and political rhetoric, the emphasis should be placed on this silver lining. Like its commerce-driven inception has demonstrated, solidarity forms around converging marketplaces. Any economy can contribute its comparative advantage, but must keep up the pace of productivity.

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Appendix

Table A1 Commodity list of average city prices during 1990-2011

White bread, 1 kg (supermarket)
Butter, 500 g (supermarket)
Margarine, 500g (supermarket)
Spaghetti (1 kg) (supermarket)
Flour, white (1 kg) (supermarket)
Sugar, white (1 kg) (supermarket)
Cheese, imported (500 g) (supermarket)
Cornflakes (375 g) (supermarket)
Milk, pasteurised (1 l) (supermarket)
Olive oil (1 l) (supermarket)
Apples (1 kg) (supermarket)
Eggs (12) (supermarket)
Tomatoes, canned (250 g) (supermarket)
Beer, top quality (330 ml) (supermarket)
Soap (100 g) (supermarket)
Batteries (two, size D/LR20) (supermarket)
Cigarettes, Marlboro (pack of 20) (supermarket)
Telephone line, monthly rental (average)
Telephone, charge per local call from home (3 mins) (average)
Electricity, monthly bill for family of four (average)
Gas, monthly bill for family of four (average)
Water, monthly bill for family of four (average)
Heating oil (100 l) (average)
Office rent per sq metre per year
Industrial space, per sq metre per year
Furnished residential apartment: 1 bedroom (moderate)
Furnished residential apartment: 2 bedrooms (moderate)
Furnished residential house: 3 bedrooms (moderate)

Countries are represented by the following cities. Austria: Vienna, Denmark: Copenhagen, Finland: Helsinki, France: Paris, Germany: Berlin, Greece: Athens, Hong Kong: Hong Kong, Ireland: Dublin, Italy: Rome, Japan: Tokyo, Malaysia: Kuala Lumpur, Netherlands: Amsterdam, Philippines: Manila, Portugal: Lisbon, Singapore: Singapore, South Korea: Seoul, Spain: Barcelona, Sweden: Stockholm, Taiwan: Taipei, Thailand: Bangkok, United Kingdom: London.

Source: EIU City Data [Online]. (2012-06-22). Available: Economist Intelligence Unit.

초록

유럽과 아시아의 지역통합과

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한 울

유럽연합은 경제활동 및 통화의 통합체제로서, 지역적 분리로 인하여 발생하는 경제적, 통화적 제약들을 줄이는 성공을 거두었다. 하지만 통상과 통화의 통합적 결단만으로는 장기간을 향한 희망이었던 모든 국가 간의 경제수렴성과 그로 인한 안정성을 유도하기에 역부족이었다. 현행중인 금융위기는 오히려 유럽연합 국가 간의 근본적 수렴성의 실패를 노출하는 계기가 되었다. 원인분석을 위한 가능한 발단 중 한 가지를 출제하자면, 수월해진 금융의 유입과 그에 따른 실질경제 성장 사이에 자리해야 할 중요한 연결고리의 상실이라고 할 수 있겠다. 하지만 다수의 여론과 일부의 연구는 문제의 원인을 과도하게 단순화하는 경향을 띄며 소위 주변국가 (peripheral countries, 즉 유로존 내 경제 약소 국가의 집합)들의 거시경제적 부패, 사회적 부도덕, 근로의 안이함 등을 근거로 내세운다. 나는 이러한 평가에 내제되어 있는 문제점을 지적하는 방도로서 두 가지 추가적인 시야를 도입하도록 한다.

우선, 생산성의 성장을 첫번째 척도로 제시함으로써 장기간의 추이를 연구하고자 한다. 그러므로 생산력이 척도로서 띄는 요소적 구성을 활용하는 셈이며, 이는 비공황시에 실질경제의 지표로서 더욱 유용하다. 반면 공황시에는 생산성이 금융쇼크에 대한 방어장치로 작용하는 것으로 보이는데, 강건한 경제적 기반이 금융투기에 반하여 가지는 효과 때문이다. 이어서 나는 상위와 동일한 맥락에서 장기간의 부문별 노동비를 산출한다. 두번째로,

나아가 상위의 지표에 대하여 유로통화 자체가 가지는 효과를 조사하는데, 이는 통화통합이 동반하는 효과와 동등하다. 유로화가 생산력 증가에 소요되는 필수적 조정을 불가능하게 한다면, 유로존 역사상의 주요 사건 또한 결국 일부 국가의 생산성 증가에 악영향을 끼칠 것이기 때문이다. 그럼으로 나는 독일을 경계로 지정한다는 가정 하에 수렴성 간의 격차와 편차를 산출함으로서 노동생산력과 부문별 노동비에 대한 유로화의 효과를 도출한다. 나아가, 아시아의 비교를 더함으로서 통화통합과 그에 연관된 정치 경제학적 문제들이 부재한 평행적 비교를 지향한다. 이러한 종합적인 실증단서들에 기반하여 소위 주변국가들의 근본적 취약함을 다음과 같이 확정할 수 있다. 본 국가들의 비공황시 금융흐름 활용의 부전과, 공황시 금융흐름 방어의 부전은 생산성 내지 부문별 노동비에서 현저히 나타나는 비수렴성의 정도와 연관성이 크다고 할 수 있다. 그 반면에 근로 복지 환경에 대한 수렴성의 효과는 비교적 큰 것으로 재차 확인되는 바이다.

하지만 근원을 보다 자세히 분석하면 소위 주변국가들의 책임의 경감을 지지하는 증거가 여럿 발견된다. 1) 장기간 추이를 살펴보면 독일의 추이에 상응하는 주변국가들의 거시경제적 대처들이 전반적으로 합당하였다고 여겨진다. 통화정책은 독일을 위한 효용성과 수출품목 상황에 가장 근접하다는 가정 하에, 통화쇼크에서 유래하는 개별적 영향을 조정할수 없게 되어 내국의 생산성 투자 및 기술을 지연하는 재정난으로 이어진다. 그러한 효과 중 인플레이션 압박의 중대함의 입지를 실증 데이터로 입증한다. 2) 그 다음 측면으로 주변국가들과 독일을 포함한 모든 유럽 국가들 간의 상대적 비수렴성을 들 수 있다. 이렇도록 접하기 수월한 데이터에 따르면 다가올 위기의 가능성을 배제하기는 어려웠다고 할 수 있으며, 국가의 생산력 성장이 이미 낮은 상태라면 통화통합지역일 경우 회복이 더욱 어려워진다. 3) 위와 같은 징조에도 불구하고 유럽연합의 정치 경제학적 틀은 이러한 파급효과에 대한 가능성을 포함하고 있지 않다. 비공황시의 주변국가들은 경제적 낙후 증상에도 불구하고 낮은 관여도를 가진다. 공황시의 유럽연합 차원의 정책들은 주변국가들에게 금융쇼크를 전가하는 현상을 초래하여, 결국 치명적인 정치 경제학적 환경을 제공한다.

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주요어: 지역통합, 통화통합, 생산성, 정치 경제학, 금융, 인플레이션
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