

Paper for the 22<sup>nd</sup> Conference of the Forum for Macroeconomics and Macroeconomic Policies

*Preliminary and incomplete - Please do not cite*

# Interpreting International Cost Competitiveness in a dynamic context

Sascha Keil, M.Sc.

TU Chemnitz

[sascha.keil@wirtschaft.tu-chemnitz.de](mailto:sascha.keil@wirtschaft.tu-chemnitz.de)

## Introduction

Economic success is attributed to the single business being prosperous. Causes are found easily: the individual ingenuity, creativeness, attitudes, risk appetite and so on. An empiric phenomenon is the regional concentration of economic success. On the other hand it, economic failure is concentrated as well. Both phenomena seem not to be connected to initial endowments. Periods of success alter apparently accidentally with periods of failure. Well-known European examples for such turning points are the unification of Italy in 1861, the Unification of Germany in 1990 and the onset of the single currency area of the Euro in 1999. Interestingly, such drastic changes of economic development coincide with major changes of the macroeconomic and monetary settings. Furthermore, the structural break in terms of economic performance occurs suddenly. Such abrupt changes are hard to explain through structural factors regarding the supply side only, as they change rather slowly. Analysing regional divergence and geographic concentration of economic activities represents a scientific battlefield. On the one hand, there exists the supply side view connecting success to favourable supply side conditions as unregulated markets. A more Keynesian version of the supply side view is that international success results from governmental economic policy headed towards promotion of innovation. On the other hand, there is the so-called 'Cambridge view' taking into consideration the demand side and its interdependencies to supply. Changes in demand are assumed to cause or at least to aggravate the difficulties of the supply side leading to further worsening conditions.

In particular, the ongoing economic weakness of the Eurozone and its internal divergence keeps this topic alive. One contended issue is the identification of determinants of the macroeconomic imbalances aka current account imbalances. The vague concept of international competitiveness is strongly connected to this question and provoked dozens of empirical papers aimed at identifying its importance. The typically used export equations contain as explanatory variables some price index, national income and several instrumental variables catching some specific aspect of quality and innovation. What seems undisputed is that the so-called income effect acts statistically by far as the most important determinant of the current account dynamics. The (foreign) income elasticity of exports results as the highest coefficient. Competitive nations show above average income elasticities, their products benefit more from foreign income growth than others. This is seen as a result coming from a supply side characterized by a specialization in certain high-tech or high-quality goods distinguished by high durability and by better service. However, the coefficients of price elasticity result low or even insignificant. An often-drawn conclusion out of this is that the price effect (price competitiveness) in its various measures is negligible or at least not the variable to focus primarily on in order to solve the problem of unbalanced trade. In this case, the burden of adjustment is on structural factors. However, the concept of competitiveness on a macroeconomic level still confuses and could be regarded as in search of a commonly shared theory. The task is difficult, since

competitiveness is an issue touching the economics of trade, growth, competition on micro as well as on macro level.

This paper aims at conceptualize the thinking of cost competitiveness and its importance within a macroeconomic framework. In particular, we will focus on relative dynamics across countries. Furthermore, we won't focus on a single variable only, since changes occur across sectors and affect various macroeconomic outcomes. The key task is to identify why one nation performs better than another on international markets. Our forthcoming analysis is explicitly a Keynesian one considering supply as demand constraint and abstracting from the combination of initially given endowments. Following Boggio and Barbieri (2017), the aim is to describe a process catching "*a true aspect of reality*" regarding the topic of competitiveness. In the first section we give a brief survey of the literature and present the different points of view of the recent debate. The second section shows some selected empiric observation of eurozone developments. Section three is the core element of the analysis, since it outlines the central assumptions forcing us to deal with the issue of cost competitiveness. As differences in cost competitiveness arise, section three discusses the dynamic macro- and microeconomic consequences of such disparities on Schumpeterian lines. The last chapter deals with two common models of international trade and asks how our theory fits to them.

## **Literature**

The huge German current account surpluses vis-à-vis other eurozone countries are one of the most investigated phenomena of recent economic history. The debate is mostly concentrated on the estimation of the impact of non-price and price competitiveness. Non-price competitiveness is seen as letting exports follow primarily foreign income respective demand dynamics. In this sense, the income elasticity of exports rules the roost. However, price competitiveness is consequently a factor far less important in determining exports. Heinze (2018) gives a broad literature overview of empirical estimations of income and price elasticities by usual export equations. Most empirical studies confirm the claim made above that, prices (used different price indices and/or nominal unit labour cost measures) have, at most, a secondary relevance. Income elasticities, however, result far more important. Even in favour of an entire rejection of any importance of price competitiveness (ULC) argue Storm & Naastepad (2015). The authors state that industrial competitiveness is driven by non-price factors as technological characteristics of the goods and high-tech productive capabilities.

From a theoretical perspective, the issue is well known as the Kaldor Paradox. The discussion about the importance of unit labour cost or export prices evolved from theoretical developments based on, among others, the thoughts of Myrdal (1957). His idea was to describe different economic dynamics between initially identical and trade-related regions. A primary change of an accidental effect can trigger a vicious as well as a virtuous circle of regional development. The triggering effect can be a change in the terms of trade (relative prices) or changes in "*inter-related economic quantities*" (p. 26)

such as demand, earning power, incomes, investment and production. Once established a difference, these forces tend to increase rather than to decrease inequalities between regions. The benefitting region will register higher incomes and higher demand for other businesses. The established industry attracts specialized supplier firms and people from other regions, a trained workforce will arise. All this increases demand further and helps to improve the structural factors coined as “non-price competitiveness” in the literature mentioned before. The process described by Myrdal refers to free market forces only and considers no intervention of economic policy. Almost no natural market force could prevent this cumulative process: *“The movements of labour, capital, goods and services do not by themselves counteract”* (Ibid. p. 26) and the system does not tend towards an equilibrium. Kaldor (1970) developed further this theory of circular and cumulative causation to a growth framework of an export-dependent country. Being more clear on the role of trade in this process he states that *“the behaviour of exports [...] will depend both on an exogenous factor-the rate of growth of world demand for the products of the region; and on an “endogenous” or quasi-endogenous factor-on the movement of the “efficiency wages” in the region relative to other producing regions, which will determine whether the regions share in the total market is increasing or diminishing”* (p. 486). Efficiency wages are defined being the ratio of money wages to productivity – what is known as nominal unit labour cost (ULC). If the ratio grows slower than elsewhere, then the region gains a *“cumulative competitive advantage”* (p. 487). Kaldor states that it is through this mechanism that the process of cumulative causation works and he emphasizes the self-reinforcing effects of regional development. However, considering his own estimations of the impact of ULC growth rates on export performance, he later doubt his own claim, that prices are negatively associated with export growth: *“The changes in exchange rates and in “competitiveness” as conventionally measured were not the cause, but the consequence of differing trends in the market shares of different industrial countries, and the “trends” themselves must then be due to factors not susceptible to measurement”* (1977, p. 104). This reasoning dominated the Kaldorian growth models as that of Dixon and Thirlwall (1975), where price competitiveness has a temporary impact only and cumulative causation is limited. The well-known balance of payment constraint growth model of Thirlwall (2002) even neglects any importance of prices or efficiency wages assuming long-run purchasing power parity.

Recent studies questioned this broadly shared belief on the theoretical and empirical level. Boggio and Barbieri (2017) revived the role of cost competitiveness (ULC) in post-Keynesian economics remembering Kaldor’s original statements. Therefore, in the original export-led growth theory Kaldor used relative levels of ULC instead of ULC growth rates. The estimations of Boggio and Barbieri showed a statistically significant impact on the growth rates of export shares. Another related topic of discussion is the parametrical use of elasticities through time in the mentioned growth models. Missio & Jayme Jr. (2012) assumed endogenous income elasticities of exports. The exchange rate can affect the industrial structure of an economy. A persistent undervaluation potentially contributes diversifying

the industry. With this in mind, undervaluation or rather lower relative prices affect non-price competitiveness and, therefore, income elasticities. Once elasticities are no longer exogenous and constant, the impact of price competitiveness becomes more important.

**Stylized Facts**

Our analysis is, in particular, inspired by the macroeconomic divergences emerged within the area of the Euro. The single currency was introduced in 1999, but important single exchange rates of the until-then-existing national currencies were already fixed before. Germany, France and Italy represent not only the most important Eurozone economies, but also different macroeconomic and fiscal systems. We want to focus on the macroeconomic developments in this period of fixed nominal exchange rates, where only underlying competitiveness factors were able to affect relative outcomes. Germany as the economically most successful country of the last decade serves as benchmark.

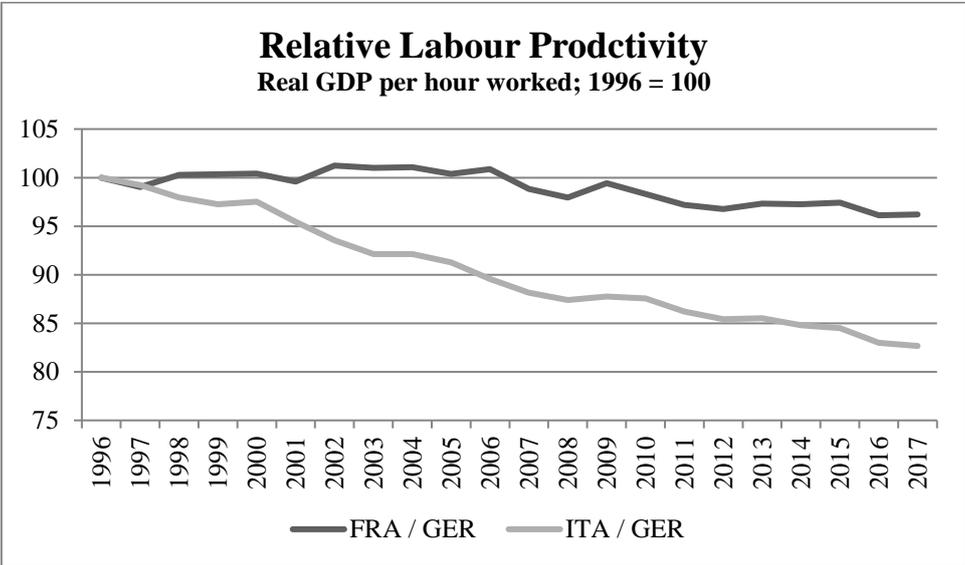


Figure 1; Data Source: OECD Data Base

The most controversial symptom is presented in Figure 1: The Italian productivity puzzle. Since the mid-1990s Italy’s labour productivity growth differs significantly from the German benchmark. For the whole period (22 years) under investigation, the growth of the real productivity in Italy amounts only 6%, whereas that of Germany 29%. However, France keeps more or less the pace of Germany, but registers a slightly negative divergent trend since 2006.

Figure 2 shows the national share of manufacturing value added to GDP, relative to Germany. France as well as Italy is confronted with a much faster process of deindustrialisation. It is remarkable, however, that in Italy the downward trend in relative terms has stopped recently. Germany’s manufacturing shows a far-above average performance and its GDP weight is only decreasing slightly.

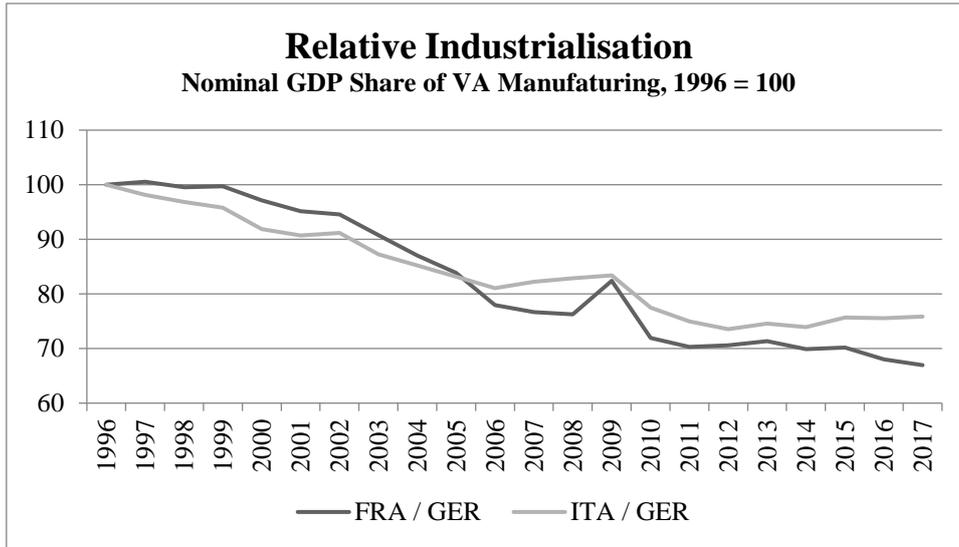


Figure 2; Data Source: OECD Data Base

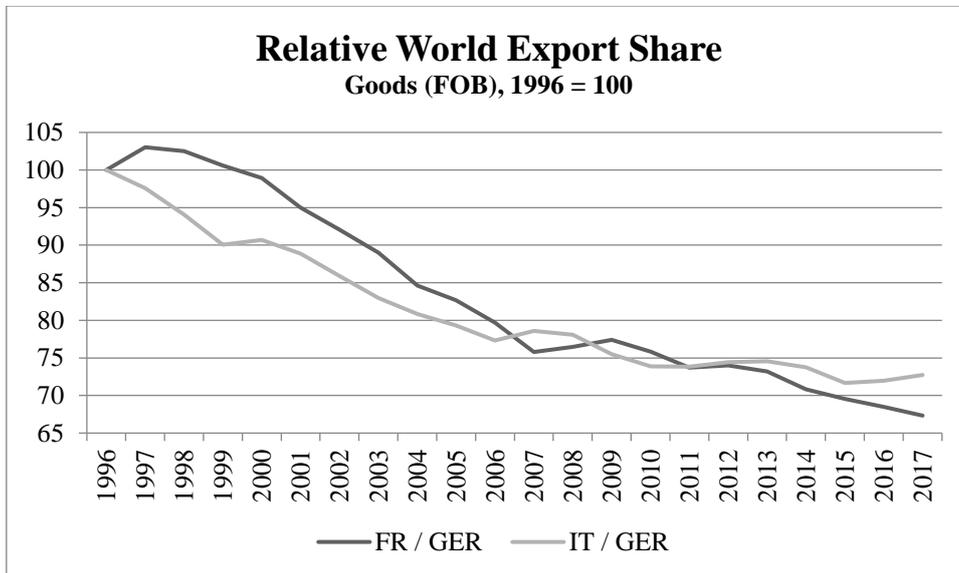
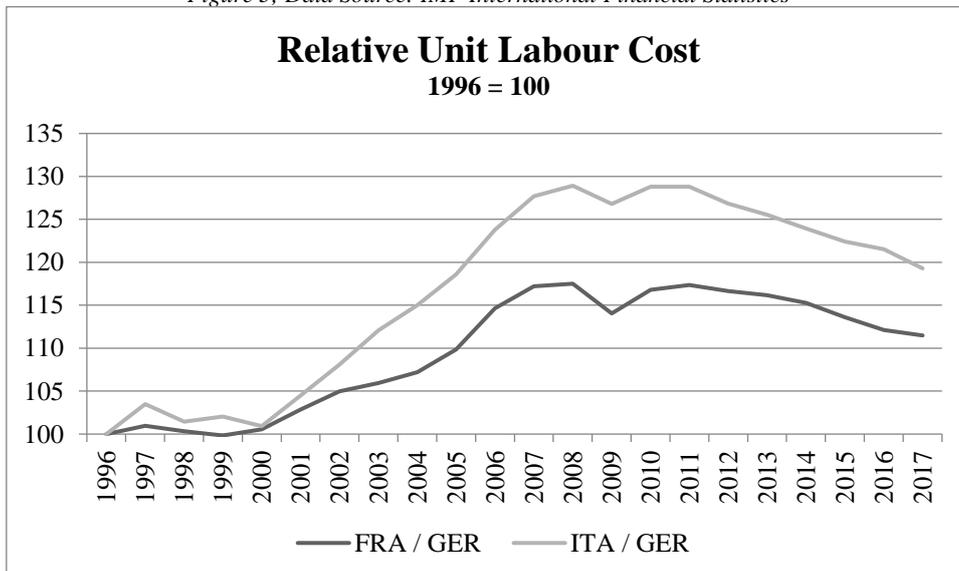


Figure 3; Data Source: IMF International Financial Statistics



The single countries performance on world markets illustrated in Figure 3 confirms the impression gained so far. Italy and France loosed continuously world market shares, much faster than Germany. Also here, Italy shows signs of bottom out of its relative decline.

Figure 4 shows the different relative cost situation of domestic production. Unit labour cost in Italy has differed enormously. Assuming equilibrated levels of unit cost in 1996, Unit cost differences piled up to almost 30% in comparison to Germany. France showed a similar tendency, with a peak of unit costs of 17% over the German level. In recent years cost increases in France and Italy were below-average forcing cost level difference to decrease. In particular, Italy cut some 10 percentage points of its relative cost level and converges continuously towards the benchmark Germany. This seems to coincide with its bottoming up in terms of market shares and manufacturing share on GDP.

## **The concept of cost competitiveness**

### **The Importance of Cost Competitiveness**

The concept of competitiveness possesses a certain vagueness and ambiguity regarding its meaning. It is mostly associated to a business economic logic and expresses the ability to sell. However, the macroeconomic version of it is strongly connected to international trade and a nation's ability to sell its domestic production successful on international markets. The criterion for success appears as a very pragmatic one: to export (sell) goods in sufficient quantity in order to ensure the import (buy) of desired foreign goods. Once the current account is in bad shape, the international competitiveness is questioned and should be restored. The adjustment then should be made in terms of quality, product innovation, productive structure or simply prices in order to strengthen the ability to sell. That's all common knowledge. But what are the arguments and empirical observations forcing economists to deal with the issue of competitiveness and, in particular, with what we call cost competitiveness?

In general, we focus on dynamics between trading countries of an area characterized by a single currency or a fixed exchange rate. However, in order to identify the role of competitiveness we go one step behind this limitation. Most macroeconomic areas are distinguished by own currencies and exchange rates to foreign currencies altering the international price of its production. According to economic theory, the task of the exchange rate mechanism on the real economy side is to roughly adjust the relative price level in order to balance the current account. This is due to the fact that macroeconomic areas, regional conglomerates of firms, show different real and monetary dynamics and need some adjustment process. In general, the exchange rate alters international prices of the domestic production. Fixed exchange rate systems or single currency areas do – per definition – not

provide this mechanism. The international price alters the same way the domestic does. If the market does not adjust price levels by itself, the determinants of domestic inflation assume the role of the exchange rate. The aim of both instruments remains the same: adjusting international prices. But changes of the instrument's values have different causes and effects. Altering the exchange rate does not require to change domestic macroeconomic forces. But changing domestic prices does. Therefore, the determination of domestic prices and its macro implications are the core processes regarding the concept of cost competitiveness in a currency union.

### **Efficiency Wages as Pricing Basis**

As common in Keynesian economics we suppose that domestic prices are determined by the ratio of money wages and labour productivity. Referring to the long-ago German transfer problem Keynes (1929) coined the ratio of money-wages to industrialist efficiency as 'efficiency wages'. In order to export more, German efficiency wages should grow more slowly in relation (at the time: in gold-rates) to the competitor countries. More precisely, in his *General Theory* (1936) Keynes mentioned efficiency wages once more as the determinant of domestic prices: "*...the general price level [...] depends partly on the rate of remuneration of the factors of production which enter into its marginal cost [the author: the wage-unit], and partly on the scale of output as a whole, i.e. (taking equipment and technique as given) on the volume of employment.*" (p. 294) According to Keynes, this is the general case as long as there is any unemployment and supply is elastic to demand. We adopt this approach for our analysis, too. This view focusses on domestic labour cost as only relevant input cost factor respective rate of factor remuneration and abstracts from foreign supply of primary products. Considering a national value chain of a commodity, the only relevant cost factor for the production remains labour. According to Keynes, the cost of production depends partly on the output of other industries. The cost of the intermediate consumption of a producer consists of labour cost or, at least, some kind of income for another producer. Keynes assumes that these rates of factor remuneration "*all change in the same proportion: i.e. the same proportion as the wage-unit*" (p. 295).

For our analysis we assume labour productivity to be the driving force affecting macroeconomic outcomes. It represents the absolute advantages or disadvantages of the supply side of an economy. But productivity is only one component determining the comparative position of a national industry. The other national peculiarity is the nominal labour cost. Wages are distinguished by intra-nationally similar dynamics. But, on an inter-national level growth rates of labour cost are quite different. Moreover, relative labour cost is exogenous to the single business or the industry. For the sake of simplicity and in contrast to many theories, we assume nominal wage growth being an external variable. A variation in productivity doesn't affect wage trends at all. Thus, productivity differences won't be balanced by subsequent wage differences. Wages potentially even amplify the effects of productivity differences on relative cost. Since nominal wages, productivity and consequently the ratio will differ across nations, the significance of interregional competitiveness becomes more explicit.

Nations are distinguished by different macro-dynamics – mainly trends in productivity and nominal wages - being mostly external to the single business.

On industry level, efficiency wages are the basis of pricing, at least as long as the profit mark-up is constant. Single industries can alter their market prices in order to keep pace with their foreign competitors. Nevertheless, having disadvantages in terms of efficiency wages aka cost competitiveness leads not necessarily to a loss of market shares, but spells trouble for the productive system. As long as we analyse the topic of cost competitiveness in single currency regimes, any equilibrating cost adjustment between regions is absent. Consequently, the observed differences in the growth rates of efficiency wages will pile up through time. According to our empirical observations in section two, only small (per se insignificant) but steady growth rate differentials can amount up to huge absolute cost level differences. In other words, a unit of marketed output (a unit of real GDP) produced in a country lacking competitiveness can have significant higher cost of production.

The interdependence of industries takes us to an empirical consequence of using efficiency wages as competitiveness indicator. As we are focussed on international prices of commodities, the typical sectoral distinction will be misleading. Relative sectoral cost (e.g. manufacturing efficiency wages) cannot be as appropriate as the cost of the entire national economy. The sectoral ratio will only account for the cost of the sectoral value added. Since information about the whole production process of a traded good (irrespective whether final or intermediate) is required, sectoral indices miss to catch the consumption of intermediate goods and services from other sectors. Given different sectoral wage structures, the level of outsourcing of industrial activities (and therefore value added), to e.g. the service sector characterized by lower wages, can differ across countries. Ludwig (2013) found significant cost advantages of single countries due to their intermediate consumption structure benefitting from their advantageous sectoral wage structure. Only efficiency wages of the entire value chain or the economy can account for this effect. Another issue is the comparability of the national efficiency wages or rather its empirical counterpart of nominal unit labour cost (ULC). Since calculated real GDP values are only meaningful in relation to some base year, absolute ULC values are too. But we assume that the use of real GDP growth rates as denominator provides some comparability. A unit more of registered real GDP means that this unit was sold or at least produced. Since customers (irrespective whether final consumption or intermediate consumption is regarded) are free to choose between goods produced at home or abroad, the marketed unit output was already competitive on an international level. It appears important to note, that in a world of underutilized factors of production and increasing returns, real productivity increases do not necessarily reflect technical capabilities or engineering ingenuity. The increase can simply be due to higher sales. In this sense, it is the past ability of a nation to offer demanded products at a competitive price regardless of its potential physical productivity.

### **Manufactured goods and Productivity Differentials**

Considering the trade statistics, the most striking observation appears the share of manufacturing goods on international trade flows. For example, 83% of European export flows were ascribed to the manufacturing sector in 2016 according to Eurostat data. Exports of services play a minor role. A distinction between tradable and non-tradeable goods is well-known in trade economics. But, apart from the physical property of a good or a service determining its tradability, there is another characteristic having far reaching consequences for our analysis. In comparison to services and primary products, manufacturing has two peculiarities: Firstly, the location of manufacturing is not connected regionally to the sales market and not to the endowment with natural resources. Secondly, the industrial production process is characterized by increasing returns to scale (Kaldor, 1981). Unit costs are a negative function of the volume of production and this is not only due to the existence of fixed cost. Increasing the produced quantity of a good, the utilisation of the production capacities grows and single production processes can be more and more standardized. Labour becomes more specialized on more standardized steps of production. Against the common belief, productivity growth can be achieved even in the absence of innovations. However, prospering demand facilitates the application of thriftier production techniques. Highly specialized supplier businesses can emerge as well and lift the efficiency of the whole value chain. According to Young's (1928) pioneering work on increasing returns the expansion of economic processes is not limited by resources, but by an inelasticity of demand. Demand growth enables the economy to exploit its productive potential and to operate at technological frontier.

Empirically the positive relationship of overall market growth and productivity growth is known as the Law of Verdoorn. Verdoorn (1949) estimated a coefficient of around 0.5. A one percent increase of the market size causes roughly half a percent of productivity growth. This empirical finding is further validated in numerous studies (Deleidi, et al., 2018). The consequence of this factum is far reaching: A regional industry or rather a regional value chain gathering higher market shares respective higher sales volumes is able to reduce its relative unit cost. The producer can reduce its relative sales prices or can register higher profits than his competitor.

In contrast to increasing returns activities, supposed constant returns would lead to stable differences of cost competitiveness. The comparison appears important to us, since it reveals that the difference of market outcomes across nations does not necessarily reflect the ability to produce competitive goods efficiently. Under constant returns, a more efficient production of a homogenous good in one country is reflected by subsequent cost differences to its competitors. The gap will exist as long as the competitor is not able to catch up, but it won't increase further through time or through higher sales. Myrdal's process of cumulative causation simply would be hampered in a system of free market forces characterised by constant returns. Hence, endogenously growing labour productivity, i.e. increasing returns, lies at the very heart of the circular cumulative causation process. Increasing returns represent

the self-re-enforcing element that causes divergent productivity dynamics. Another consequence is that increasing returns lead to oligopolistic or monopolistic competition. Accordingly, producers have some monopolistic pricing power and are able to produce more than they actually do, even at a lower price. Concentration processes of industrial activity can potentially be expected. In the case of a homogenous good, production tends to be dominated by one firm, which is able to sale at a more convenient price than its competitors. This is true also on the level of geographic areas. Countries can create or experience competitive advantages and attract productive processes at the expense of other countries. Industrial activities can be concentrated in certain prospering areas. Within federal states this process is counterbalanced to some extent: Regions losing industries become net-recipient of fiscal transfers and don't face balance of payments constraints. On international level this mechanism simply does not exist. Countries losing industries import more and experience increasing foreign debt without any compensation from the benefitting countries.

Being characterized by increasing returns, manufacturing becomes the driving force of the overall economy. The leading role of manufacturing represents a main component of Kaldorian growth theory (Thirlwall, 2002). The progress of the productive structure and innovations render productivity increases in other sectors possible. A rise in sales of the final good fosters demand of intermediate goods as well. As sales of suppliers rise, their labour productivity increases subsequently. The overall productivity growth becomes attuned to the progress of the dynamic manufacturing sector. The concept of a value chain illustrates how different sectors can be affected through a change in the sales volume of the final good. It demonstrates how benefitting suppliers in turn affect other value chains as well. This interconnection shows why economic success regards entire value chains, but is regionally concentrated as well: Significant parts of intermediates production and service supply have to be located closely to the productive processes. Hence, our analysis focuses on the competitiveness of regional conglomerates of firms.

Trade, in Keynesian economics, acts as a drain of demand. We expect competitiveness to lead this demand flows towards competitive areas. But, remembering the endogeneity of productivity growth in manufacturing, this extra demand flow is far more important because it permits benefitting industries to specialize further. In the case of a small country, the industry can be specialized on a particular part of an international value chain. Being restricted on its small home market would limit the degree of specialization of the industry. Due to the relative low demand from the domestic market, the industrial structure would be stuck on a lower scale of development than in the case of successful participation in international trade. This shows how important a successful participation in trade is for establishment of industrial structures. However, a nation characterized permanently by weak cost competitiveness experiences a creeping extinction of its industry. An internationally not-competitive manufacturing sector will register an above-average loss of GDP share. A lagging country can certainly make up for that loss through importing capital goods from abroad, benefitting in this way from productivity

increases of other nations. Nevertheless, the potential of productivity growth declines. Consequently, the growth of the overall income level (regarding a balance-of-payments-constrained nation adjusting its domestic income to avoid trade deficits) would differ negatively from that of nations that are more successful. To sum up, in order to participate successfully in international trade, the manufacturing sector has to be competitive. Cost competitiveness is important for the export performance, the existence of industries and therefore, the degree of industrialisation as well.

## Efficiency Wage Differentials and its Consequences

### Some interpretative remarks

An implicit theoretical assumption of our reasoning about the process circular cumulative causation is that we deal with a non-equilibrating system of market forces. Once in disequilibrium, differing cost competitiveness is at the same time cause and consequence of divergent movements. It is cause, because higher relative prices lead to lower sales volume and lower productivity. It is result, because divergence of productivity growth not balanced by wages causes divergent competitiveness. Another implicit assumption is that, at least on theoretical level, there exists an equilibrium of balanced cost competitiveness. In this equilibrium range the national cost structures do not provoke self-reinforcing disadvantages for single national industries and competition takes place on the productivity side only. Since there are dozens of competitor countries, dozens of different industrial structures and, hence, dozens of different growth trends of efficiency wages, identifying one true level of equilibrium is an analytical dilemma. As will be shown later on theoretical level, a knife-edge equilibrium can be demonstrated algebraically due to some simplification. Given that mathematical exactness appears inappropriate in the analysis of the real world, an open question remains by what this balanced competitiveness is characterized empirically. A balanced current account can be a meaningful criterion. Since the current account is driven predominantly by domestic and foreign income growth rates, it is only a proxy. As the level of relative efficiency wages differs according to the counterpart nation and the respective competitor sectors a unique satisfying equilibrium level of competitiveness won't be evident.

However, more significant for our analysis and more straightforward to identify are situations of competitive disequilibrium. Piled up differences in national cost structures lead to a situation comparable to over- or to undervaluation in exchange rate regimes. We will call this a disequilibrium position. Symptoms of disequilibria can be sustained current account deficits due to weak export performance, losses of world market shares across sectors, faster de-industrialisation, slower overall growth, slower labour productivity growth and higher foreign debt, all from a comparative perspective. In particular, we are concerned with processes affecting not only single industries, but the performance of a national industry as a whole. According to Dosi & Soete (1988) long-term changes of comparative advantages "*are often linked with country-wide changes in world-market shares which often occur all (or most) sectors...*". Single industries may differ massively from the average performance, but this is not the issue of this work. We focus on processes of all national value chains showing the same tendencies altogether due to competitive disequilibria. An important question is how these macroeconomic disequilibria are created. We answered this through the interaction of the inter-related macroeconomic quantities, mainly wages and sales number resulting in productivity differentials.

The importance of cost competitiveness has not the same relevance in all parts of the economy. There are value chains affected more and value chains affected less. First, it is important to clarify to which kind of market and implicitly to which kind of commodity our analysis applies most. Beside the classification of manufactured and not-manufactured goods, another distinction appears helpful. There are industries producing goods at the frontier of technology and innovation and industries producing conventional and established goods. In general, we regard today's established industries and their product range to be results of the past. Mostly through decisions taken by economic policy of the government or through historic accidents national industries take a particular direction. Thanks to increasing returns they specialize on certain final and intermediate goods. Due to the dependence of the service sector on manufacturing, a great part of the national economic and even the societal structure depends on the established industry. According to Setterfield (1998, p. 372) "*...the faster the growth within the context of a certain technique of production, the faster interrelatedness will proliferate, and the more likely it becomes that the region will experience lock-in to this specific technique*". One point is, this specialisation represents an grown absolute advantage regarding the productivity in the production. The consequence is an increasing difficulty of changing this grown structure toward the production of more demanded or less price-elastic commodities. This is true, in particular, when such innovative industries are very different from the established ones. Out of that, problems can arise when international demand for the established commodity declines or low labour-cost countries imitate the production and competition becomes stronger. It is doubtful whether free market forces alone are sufficient to establish new industries, since they may have to compete with foreign competitors producing at an already higher scale of productivity. If a nation is specialized in rather low-tech or medium-tech products, its industries become subject to stronger price-competition. In order to keep these industries alive, the maintenance of cost competitiveness becomes the key issue. Consequently, the concept of cost competitiveness is more relevant for nations whose products are exposed to strong competition. In general, we regard most of the trade goods as being of the conventional kind rather than being at the technological and innovative frontier. From a different theoretical point of view, Dosi et al. (1990) link the relative level of cost (wages) negatively to the variety of produced commodities (non-innovative) of a country. Productivity per sector (commodity production) is assumed to be equal across nations, thus, lower relative wages in one nation leads to a more diversified industry at the expenses of other countries. A basic assumption behind is, that, in absence of a naturally given advantage, i.e. the endowment of natural resources, manufactured goods can be produced everywhere with a identical technology. In other words, relative cost determines "*the set of commodities that can be produced competitively*" (p. 244) in a country. Already in this static world of given productivity, lower relative prices determine locational decisions of producers in favour of cost-competitive areas.

### **The case of developed industries**

Already the static analysis provides the insight that the level of relative efficiency wages determines whether the production of manufacturing commodities within a nation is competitive or not. We, however, assume differing levels of labour productivity across nations and increasing returns to scale as usual case of industrial activities. The growth of productivity differs according to the national performance in selling its products. Time becomes an important factor of this analysis, since productivity and cost growth differences of the past amount up. Thus, our analysis has to be extended to a dynamic one. Well known in this context are technology-gap frameworks based on Schumpeter's theory of economic development (1934). Macroeconomic dynamics are explained through the interplay of two competing forces. The first one tends to increase the productivity gap to its competitors via innovations for the pursuit of monopolistic profits of technological pioneers. Considering the achieved monopolistic profit margin, the second entrepreneurial force tends to close this gap entering the market by imitation and own innovation. As the lead of the pioneer melts down, prices and profit margins decrease as well due to more intense competition. We want to extend this framework into an efficiency wages-gap trade framework dealing no longer with absolute technological differences, but with emerging differences of the relative cost structure of production. This might help us to identify how endogenous markets forces adjust to disequilibria.

Increasing returns in the production of traded goods render the issue of cost competitiveness more significant as they amplify cost differences far beyond technological gaps. The static fact of a initial competitive advantage has far-reaching dynamic consequences as market forces work self-reinforcing. How the micro- and macroeconomic environment adapts dynamically to these generated disequilibria is the key process to analyse. In our simple case we assume a situation of two competing nations being characterized by similar macroeconomic and, in particular, similar productivity dynamics in the past, keeping equally the pace of international markets. Both compete on domestic and international markets mainly in selling a conventional commodity, e.g. automobiles, whose production dominates the respective domestic industry.

#### *Stronger Wage increase*

Assume now the emergence of a constant difference in the growth of efficiency wages due to higher national wage increases in country A. The average producer in this country is now subject to higher relative cost of production, even of an increasing absolute difference. If the producer tries to keep the pace by pricing-to-market policies, the profit margin decreases. If, however, he passes the cost increase directly on prices, he experiences a slowdown of sales, since we expect international demand to be price-elastic. This provokes a slowdown of labour productivity growth as well. In both cases, the constant differences of efficiency wage growth causes steadily diminishing profits for the producer in comparison to its competitor in country B. A conceivable remedy for country A's industry constitutes (a) investment in the productive structure in order to rationalize. Another option represent the

innovation and diversification of products (b) in order to render the product range less sensible to relative prices. The mentioned options appear improbable to us, at least in the case of steadily deteriorating efficiency wages. Process innovation leading to rationalisation (a) can help to adjust the cost structures in a certain range for a certain time, since we know that efficiency wages worsen continuously. However, as we know, the production cost of a final good consists not only of the cost structure of the final assembly. The expenses of the whole value chain, incorporating the contribution of various economic sectors, have necessarily to be considered. Despite rationalisation of the final assembly, supplier cost structures and prices remain unchanged nevertheless. From the point of view of the final producer, the share on average unit cost of e.g. service supply like consulting tends to be higher, if the number of produced and sold units is lower. The whole (national) value chain further loses ground in terms of relative costs as the efficiency wages of country A worsen steadily. Thinking of Keynes' marginal efficiency of investment theory, this point becomes more obvious. When profits or even the sales volume are expected to shrink, the estimated return on investment is affected negatively. Once entrepreneurs expect worsening relative cost structures it becomes implausible to invest in the production of goods being exposed to stronger price competition. For a similar reason, the product innovation and product engineering remedy (b), especially important in consumer goods industries, is improbable as well. Certainly, the innovative efforts help for some period, but as the difference of efficiency wages is persistent, it appears hard to keep the pace through time. As we expect customers to consider the quality-to-price ratio as crucial argument, also a diversified product of high quality can have a comparatively too high cost of production. The advantage in terms of technology can be offset by higher prices and will not lead to stronger sales. Furthermore, several scholars confirmed statistically that innovations in terms of, e.g., patents follow empirically demand. This relationship was originally put forward by Schmookler (1962) as "demand-pull" hypothesis. The promise of increasing sales favours research and innovations, in particular small-scale innovations (Kleinknecht, 1998). Being in a situation of decreasing sales or steadily shrinking profits hinders this counter-reaction due to the absence of prospects and may also budgetary reasons of single producers in difficulty as well. Given that nominal wage growth is external to the industry, the situation requires offsetting the unfavourable trend of efficiency wages by strong growth of sales and extraordinary gains in labour productivity of the whole value chain. To sum up, an economic setting characterized by increasing unit cost, high-price sensitivity, strong competitors, limited extra-demand and faster growing nominal wages represents an unfavourable environment for such catching up processes aimed at closing the productivity gap. A counter-reaction requires rising demand, but the market itself leads demand flows to foreign competitors.

The competitor industry in country B is, on the other hand, characterized by efficiency wages growing slower due to the stronger wage-growth trends of country A. Consequently it experiences a cost advantage. This advantage is even growing in absolute terms. Concerning the pricing process, the

industry possesses an increasing space of pricing. The consequence of lower relative prices are higher sales, resulting in higher utilization of productive capital respectively productivity. In the case of unchanged relative prices, firms experience better unit profit margins (sales unchanged, taking advantage of higher price range). From the point of view of competition economics, it seems worth to note that the emerged cost advantage is not a result of a better performance of the industry due to innovative policies. On a micro-level the advantage can be completely independent from single business actions as the persistent difference in external nominal wage growth proves. This means that productivity gains are not necessarily connected to single business actions aimed at productive improvements. However, slower growing efficiency wages improve the relative cost situation through time. Thus, the potential of taking advantage of further productivity gains rises and the ability to persist in competition becomes easier. Positive prospects in terms of market shares, sales and profits marginal efficiency of investments prevail. Furthermore, through an increased capacity of self-financing and creditworthiness investments become more likely.

#### *Stronger productivity increase*

Certainly, a difference in efficiency wages can emerge from absolute technological advantages as well. It is of no importance for our analysis whether the term technological advantage reflects new innovative goods or some improvement of the productive system. If, e.g., economic policy of one nation succeeds in favouring innovation on a large scale, international sales and labour productivity rise comparatively. Even if innovative achievements regard not all industrial branches, due to spill over effects, we expect other sectors productivity to benefit as well. The economy becomes attuned to the most dynamic industries. Through the rise of sales and increasing returns efficiency wages start to grow more slowly in relation to the competitor countries. It is useful to remember that under constant returns, however, the difference of efficiency wages would reflect the technological advantage. But, increasing returns strengthen the advantage furthermore. Lagging nations have not only to catch up on the level of innovation, they are punished even more by extra cost disadvantages due to lower scale economies through time. It seems worth remembering the counter-reaction in a flexible exchange rate system. In order to avoid huge trade imbalances, the exchange rate could potentially cut the price advantage of country B in both dimensions – the technological gap and the scale economy gap as well. In such a regime, self-reinforcing processes are limited to some extent. As already mentioned above, it is doubtful if market forces alone are sufficient to reform a whole productive system in order to catch up the productivity gap. Market forces tend to favour the part of industry still possessing its competitive advantage and to punish the part lagging behind due to the absence of positive sales prospects.

#### **The case of developing countries**

Up to this point we assumed a competition of equally developed industries, i.e. countries characterized initially by similar wage and productivity levels. However, the concept of cost competitiveness has

serious implications for developing countries and their participation in international trade, too. From the point of view of the demand side, the promise is to escape the small home market and to develop an own industry benefitting from the larger size of the international market. In order to catch up in terms of productivity and wealth we consider two ways as the most promising: Building up an own industrial structure (c) based initially on imitation of foreign products or the attraction of certain parts of an industrial production (d) run by foreign corporations. The leverage factor for both options is the utilization of the lower absolute wage level, which potentially renders reasonable the creation or relocation of certain parts of a value chain towards developing countries. Due to the lower state of development the industrial system is often characterized by a low- or medium-tech productive structure. The country aims at gaining market shares at the expense of established foreign competitors characterized by higher productivity. The development model of product imitation (c) means to enter markets characterized, then, by a high degree of price competition. From the static view we know already that the level of relative wages alters the variety of commodities which can be produced competitively. The lower relative wages, the more can be offset a low domestic industrial efficiency. The consequences of under- and overvalued cost structures for building up a production are straightforward to the reasoning in the section above. Undervaluation in terms of relative cost and prices is the cause of success on international markets, but, at the same time, it is consequence as well. Positive sales prospects trigger further positive endogenous market forces as investments and innovation. Undervaluation leads to better self-financing conditions due to better relative profits. On the other hand, catching up under conditions of free trade with an overvalued cost structure appears not probable. This finding supports the infant industry-view that an undervaluation is prerequisite for the process of catching up. Thus, the establishment of industries based on imitation of demanded commodities is unlikely. The competitor abroad produces already at a high scale and its industrial environment is grown according to the needs of the particular productive system. If efficiency wages worse steadily it appears not realistic to enter already established product markets successfully.

A particular issue is the location of parts of existing value chains (d) following the barge economics hypothesis of Palley (2015). Since big global corporations control large sections of their value chains, parts of production can be relocated in search of the most favourable conditions. Value chains become flexible and follow the principle of global cost arbitrage. We want to emphasize the peculiarity of this important feature of international trade: These corporations can move not only parts of production but their already achieved productivity as well. This represents an important difference to the model of imitation with regard to increasing returns. Since the sales volume won't be affected, a high output level, i.e. scale of output, of the relocated value chain part is guaranteed. In this way, it is possible to combine a low level of cost, i.e. wages, with an already achieved high labour productivity. Therefore, value chain efficiency wages can be far below a national average. In any case and besides several

favourable supply side conditions, prerequisite for such relocations is a stable and predictable efficiency wage trend in order to keep the cost advantage for a certain time.

### **The case of wage adjustment**

In the latter part, we were concerned with what we call market-endogenous reactions to competitive disequilibria. This setting considers nominal wages as cost factor only, altering international cost and prices through its impact on efficiency wages. The cost-factor view applies to nations whose industry is predominantly dependent on exports. In such a case, wage moderation has negligible negative effects for world as well as domestic demand. They are negligible because they were offset by the expected positive effects coming from more external demand due to lower prices. Now, we consider wages as important element of aggregate demand, too. Wage-induced demand affects equally the growth of labour productivity according the Law of Verdoorn. Hence, it becomes necessary to abandon the partial analysis framework used so far, since it does not account for income-demand effects.

Now, suppose that significant competitive disequilibria between countries have emerged for some reason and that the attempt for adjustment is carried out via national wage policy. This issue is of particular interest, because nominal wage trends affect several macroeconomic outcomes as demand for domestic as well as foreign production. The bigger the economy is on global scale, the more negative are the overall effects of such a strategy. One reason is that wage moderation in the sense of stagnating or decreasing nominal wages works as a reduction of global aggregate demand. Domestic demand decreases in absolute or relative terms and is replaced by foreign demand. Global demand will differ negatively from the former trend. This may provokes lower productivity growth. Another point is that sufficiently strong wage moderation, e.g. nominal wages increasing only as fast as productivity, leads to deflationary tendencies with all its negative implications on consumption and investment.

Competitive disequilibria will put asymmetrical pressure on countries whose efficiency wages grew faster in past, to adjust to the lower-cost competitors. Even countries characterized by the highest relative levels of productivity can be exposed to pressure and have to adjust their competitiveness as well. Despite the higher productivity and the technological advantage, the production unit cost of marketed output can simply be too high. Losses in market shares, export dynamics and the deterioration of the trade balance may force economic policy to adjust its cost competitiveness or to adjust the volume of imports through a reduction of domestic demand. If, however, the country wants to maintain its domestic dynamics in terms of wages and aggregate demand it has to deal with a rise of foreign debt emerging as counterpart to the deficits of the goods balance. The pressure of adjustment is asymmetrical, because countries with slower efficiency wage growth will experience positive effects coming from trade. As things work well, national economic policy won't feel compelled to adjust. It is important to note that gaps in terms of productivity alone don't have such an impact. A lower but

competitive productivity won't provoke macroeconomic distortions as the country doesn't get negative feedback effects from international trade.

In general, price competition on single goods markets is considered as favourable to customers. Under conditions of imperfect competition it is expected the most competitive producer to survive. It's the vendor who has met demand best in terms of quality, utility and price. Businesses not at all able to meet the criteria of demand disappear. But, considering also trading nations as competitors forces us to recognize important differences in the concept of competition and its limited advantageousness. First, as often stated in economic literature, nations will not disappear like a defeated competitor. Second, lagging countries may not be able to maintain their demand for foreign products. This will affect the exports of the benefitting country. as disequilibria render painful adjustments in terms of cost competitiveness necessary, market pressure will force nations to downward adjustments in terms of wages and demand. Thus, national efficiency wages tend to decrease relatively. Without coordination, pressure leads to overall declining growth rates of efficiency wages. This, in particular, holds true when the lower-cost country wants to keep its advantage. Through this market logic nations would face the risk of deflation as efficiency wages determine the inflation rate. Furthermore, a significant part of aggregate demand, the wage-induced demand, will face slowing down dynamics or even decline. Obviously, this threatens the operational conditions for economic prosperity. In a nutshell: uncoordinated downward adjustment of efficiency wages leads necessarily to deflationary tendencies and diminishing growth.

The difficulty of managing efficiency wage growth arises from its different significance for different macroeconomic areas, namely overall economic growth and international trade. While the need for adjustment of efficiency wages grows out of the importance of prices for manufacturing products in the sphere of international trade, the consequences are equally important for domestic and overall growth, i.e. wealth. The task of efficiency wage coordination is to enable nations characterized by different macroeconomic characteristics, e.g. productivity, industrial structures, wage bargaining, to trade freely and ensure mutual benefits from trade. The necessary condition for this is that efficiency wage dynamics do not affect negatively overall growth and overall productivity levels. The condition out of this is that the growth trend of overall efficiency wages has to be sufficiently positive. Nominal wages have to grow faster than real productivity. Hence, nominal wage-induced demand growth exceeds the growth of real output. First, this avoids deflationary tendencies as efficiency wages determine the price level of domestic production. Second, increasing efficiency wages ensure rising demand. We regard this as a prerequisite for positive sales prospects for producers and consequently important for investment. Beneath a positive efficiency wage growth there have to be coordinated adjustments of cost structures in order to avoid competitive disequilibria. A more competitive country has to raise its wage growth trend in order to worsen its cost competitiveness and increase its demand for imports of the lagging behind country. This approach ensures productivity growth to be unaffected.

However, uncoordinated and downward headed adjustments of efficiency wages will destroy positive growth prospects and potential wealth. Without such coordination a race to the bottom is possible. Hence, single nations would be better off opting for changes in the exchange rate regime or protecting its own manufacturing sector via e.g. tariffs or subsidies.

### **The question of non-price competitiveness**

Following our treatise so far, cost and price levels play a prominent role in leading demand flows. But competitiveness is generally seen as consisting of two elements: price and non-price factors. Hence, non-price factors should capture effects not reflected in prices. We have serious concerns about the significance of non-price competitiveness on a macroeconomic scale. First, we assume that customers make their purchasing decisions on the basis of prices relative to the good's utility. Utility in our understanding combines the rating of different factors like quality, durability, service in comparison to alternative products. Thus, the customer already evaluates whether the offered utility is worth the required price. If a unit of a certain commodity was sold – and not another substitute -, we assume it was competitively priced. In general, we expect non-price factors to be reflected in prices at the end, as such non-price advantages cause cost for the producer. For example, a higher quality requires better product engineering; a higher durability needs better materials and a more careful processing. According to this theoretical concept it is possible to compare prices of competing products characterized by different levels of utility. A product characterized by significant technological advantages vis-à-vis similar products can nevertheless be priced too high and, thus, not being sold. Providing comparability on product level means calculating a comparative unit of utility similarly to the concept of homogenous goods. This is obviously a microeconomic task and does not matter that much for our analysis. Since we are dealing with real GDP or rather real productivity as denominator of our price level equation, the comparative unit of marketed output on international level is sales. The comparison of nominal cost per unit of marketed output across countries leaves no space for not quantifiable factors.

The assumption of increasing returns takes us another step further with respect to the term competitiveness. Suppose two competing countries, both are producing an initially homogenous good at the same price. Now, country A succeeds in acquiring a technological advantage somehow not reflected in cost and price and, therefore, offers a better product still at the same price. Customers of both countries, taking note of the technological difference, tend more to purchase the advanced alternative of country A, as it is more convenient in relation to its utility. Country A experiences an increase in sales whereas the industry in country B registers a decline. According to the principle of increasing returns, the expansion generates the condition for higher productivity gains in country A. The relative price decreases and causes further feedback effects from positive sales. In other words, in a world of increasing returns an imaginary non-price advantage is translated into the cost structure and, therefore, into prices through time.

## The role of Cost Competitiveness in Post-Keynesian Modelling of Foreign Trade

In the following section we want to focus on two common frameworks explaining the trade performance differently: Kaldor's export-led growth model (ELG) formalized by Dixon and Thirlwall (1975) and the export-propelled growth model of Beckerman (1962). Like Boggio and Barbieri (2017), we want to direct further attention on how both models interpret the role of cost competitiveness. The way productivity growth and the price formation process are formalized in both models is straightforward to our Keynesian efficiency wage statement above:

$$r_d = \lambda(g_x),$$

$$p_d = w_d - r_d.$$

Productivity growth  $r_d$  is a positive function of export growth  $g_x$  acting as market size proxy. According to the assumption of increasing returns to scale, a growing market causes labour productivity to grow, too. The Verdoorn coefficient is represented by  $\lambda$ . The increase of domestic prices  $p_d$  is determined by the growth of nominal wages  $w_d$  minus the growth of real labour productivity. For the sake of simplicity, the profit mark-up is neglected as we assume it to be constant. In both models the cost level variation is identical the price variation.

However, in the ELG model prices play a minor role as one-time changes of the price increase have no lasting impact on the export growth rate. The growth rate of exports is represented by

$$g_x = \frac{[\eta(w_d) + \delta(p_f) + \epsilon(z)]}{1 + \eta\lambda},$$

where  $\eta$  is the (negative) price elasticity for exports,  $\delta$  the price elasticity for imports,  $p_f$  the foreign price increase,  $\epsilon$  the import elasticity for exports and  $z$  the world demand. The growth rate of exports converges towards equilibrium, which is determined by 'structural factors' represented by the elasticities. Hence, cumulative causation is absent or at least limited, since elasticities are assumed to be constant.

In order to make this model circular we have to obtain a first difference equation system introducing a one-period lag structure into the export equation. The general solution is as follows

$$g_x = A(-\eta\lambda) + \textit{Equilibrium Solution}.$$

As  $|\eta\lambda|$  will be less than 1, the growth rate converges to its equilibrium value. Accordingly, the crucial determinants are all constant parameters. A self-reinforcing effect triggered by different cost and price structures cannot be observed. The model suggests that constant price or rather unit cost trends across

countries do not yield such problems as pointed out by our verbal analysis. Despite an ever increasing unit cost difference to its competitors, the lagging country does not suffer from an extinction of its export substance. We regard this as an unrealistic outcome since we observe huge real world price level differences occurring jointly with significant downward movements in terms of export growth and industrial performance. This is true, in particular, when countries compete in similar industries and the production of a close substitute would differ significantly in terms of cost. Dixon and Thirlwall bear this already in mind as they state that in this additive export function price changes have no permanent effects. Hence, provided that prices should play a major role, they suggest a multiplicative demand function, affecting the structural parameters as well.

On the other hand, the Beckerman model represents the opposite extreme regarding the importance of prices. The respective export function is

$$g_x = \epsilon(z) + \eta(1 - \alpha),$$

Where  $\alpha$  represents the ratio of the domestic price level to the foreign one. The changes in single country's price level are determined as stated above. In the case price levels are identical;  $\alpha$  becomes 1 and export growth rates are all the same across countries. Since  $g_x$  and  $\alpha$  are interdependent, deviations from 1 lead directly to diverging export growth rates. This means, that different price levels lead in a self-reinforcing way to the extinction of the industry and, therefore, the export substance in the lagging country.

The Beckerman model stands for a world of monopolistic competition. At the end, only one firm will produce a homogenous good. Lagging competitors will disappear. We follow, that this is a process applicable in international macro context, if different national industries compete with a close substitute, demand being price-elastic and cost and prices between nations not balanced by any mechanism. On the other hand, the ELG approach represents an international competition where cost level differences are negligible or are balanced immediately. In such a case, the industrial structures govern the trade performance.

## **Conclusion**

The avoidance of huge absolute unit cost differences between trading countries is a prerequisite for free international trade. Our analysis showed the far-reaching consequences of competitive disequilibria in a dynamic framework. Market forces alone are not sufficient to avoid diverging movement. The key instrument is the collective governance of national efficiency wages in order to allow for mutual benefits from trade and to operate at the productivity frontier. We regard the cost factor as the most important element, since increasing return in the production of traded goods can lead to huge cost structure differences not reflecting the true technological capabilities. The implications regard not only export performance, but the existence of the manufacturing sector as well.

## References

- Beckerman, W., 1962. Projecting Europe's growth. *Economic Journal*, Vol 72, pp. 912-9125.
- Boggio, L. & Barbieri, L., 2017. International competitiveness in post-Keynesian growth theory: controversies and empirical evidence. *Cambridge Journal of Economics*, No. 41, pp. 25-47.
- Deleidi, M., Paternesi Meloni, W. & Stirati, A., 2018. Structural Change, Labour Productivity and the Kaldor-Verdoorn Law: Evidence from European Countries. *Roma Tre Working Paper No. 239*.
- Dixon, R. & Thirlwall, A., 1975. A Model of Regional Growth-Rate Differences on Kaldorian Lines. *Oxford Economic Papers, New Series*, Vol. 27, No. 2, July, pp. 201-214.
- Dosi, G., Pavitt, K. & Soete, L., 1990. *The Economics of Technical Change and International Trade*. New York: New York University Press.
- Dosi, G. & Soete, L., 1988. Technical Change and International Trade. In: G. Dosi, C. Freeman, S. G. & L. Soete, eds. *Technical Change and Economic Theory*. London / New York: Pinter Publisher, pp. 399-431.
- Heinze, H., 2018. THE determinants of German exports: An analysis of intra- and extra-EMU trade. *Working Paper of IPE Berlin 95/2018*.
- Kaldor, N., 1970. The Case for Regional Policies. *Scottish Journal of Political Economy*, Vol. 60, No. 5, pp. 481-491.
- Kaldor, N., 1977. The effect of devaluations on trade in manufactures. In: *Further Essays on Applied Economics*. London: Duckworth.
- Kaldor, N., 1981. The role of increasing returns, technical progress and cumulative causation in the theory of international trade and economic growth. *Economie Appliquee*, No. 4.
- Keynes, J. M., 1929. The German Transfer Problem. *The Economic Journal*.
- Keynes, J. M., 1936. *The General Theory of Employment, Interest and Money*. New York: Prometheus Books [1997].
- Kleinknecht, A., 1998. Is labour market flexibility harmful to innovation?. *Cambridge Journal of Economics*, 22, pp. 387-396.
- Ludwig, U., 2013. Arbeitskosteneffekte des Vorleistungsverbundes der deutschen Industrie unter Berücksichtigung der Arbeitszeiten. *Gutachten im Auftrag des Institutes für Makroökonomie und Konjunkturforschung in der Hans-Böckler-Stiftung*, 28 Oktober.

- Missio, F. & Jayme Jr, F., 2012. Structural Heterogeneity and Endogeneity of Elasticities on the Balance of Payments Constrained Growth Model. In: E. Soukiazis & P. Cerqueria, eds. *Balance of Payments Constrained Growth Models: History and Overview*. s.l.:Palgrave Macmillan UK, pp. 239-269.
- Myrdal, G., 1957. *Economic Theory and Underdeveloped Regions*. London: G. Duckworth.
- Myrdal, G., 1957. *Economic Theory and Underdeveloped Regions*. London: G. Duckworth.
- Palley, T., 2015. The theory of global imbalances: mainstream economics vs. structural Keynesianism. *Review of Keynesian Economics, Volume: 3 Issue: 1*, p. 45–62.
- Schmookler, J., 1962. The economic sources of inventive activity. *The Journal of Economic History, Vol. 22, Issue 1*.
- Schumpeter, J. A., 1934. *The Theory of Economic Development*. Oxford: Oxford University Press.
- Setterfield, M., 1998. 'History versus equilibrium' and the theory of economic growth. *Cambridge Journal of Economics, 21*, pp. 365-378.
- Storm, S. & Naastepad, C., 2015. Crisis and Recovery in the German Economy: The Real Lessons. *Structural Change and Economic Dynamics Vol 32*, pp. 11-24.
- Thirlwall, A. P., 2002. *The nature of economic growth*. Cheltenham: Edward Elgar Publishing Ltd..
- Thirlwall, A. & Dixon, R. J., 1975. A Model of Regional Growth-Rate Differences on kaldorian Lines. *Oxford Economic Papers Vol. 27*, pp. 201-214.
- Verdoorn, P. J., 1949. On the Factors Determining the Growth of Labour Productivity. *Italian Economic Papers, 2 [1993]*, pp. 59-68.
- Young, A., 1928. Increasing Returns and Economic Progress. *The Economic Journal, Vol. 38*, pp. 527-542.