ECONOMIC AND BUSINESS REVIEW

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CONTENTS

PERCEIVED RISK INFLUENCE ON THE CONSUMER ATTITUDE TO PRIVATE LABELS IN THE PRODUCT'S LIFE CYCLE GROWTH STAGE

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ABSTRACT: *The aim of this paper is to explore the relationship between purchasing risk associated with private labels and consumer attitudes towards private labels in different product categories in the growth stage of the product life cycle. The first part of the paper is devoted to a brief literature review of the relevant constructs. The second part describes the research and summarizes its results. Descriptive research was conducted on the Croatian market relating to private labels in three different product categories in the growth stage of the product life cycle: liquid soap, chocolate and facial care products. The results confirm negative correlation between perceived risk and attitudes towards private labels in all analyzed categories.*

1. INTRODUCTION

Private labels are usually defined as products that are owned and managed by organizations whose primary economic orientation is distribution and not production (Schutte, 1969 in Zielke & Dobbelstein, 2007). Lincoln and Thomassen (2008) trace the beginning of private label development to ancient times when brands, as such, did not exist, so the trade was based on products owned by merchants as the only link with consumers. However, the first written record of private labels development dates from the mid-19th century. Since then private labels have continuously been present on the market but their significant expansion started in the last 35 years (Herstein & Gamliel, 2004). Among many factors that have led to strong private label growth, the main drivers are the expansion of retailers and their consolidation as well as the growing presence of hard discounters (de Jong, 2007). Market conditions have hindered retailers' ability to differentiate so retailers started to develop private labels, exclusively present in their stores, in

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order to differentiate themselves and strengthen their market position. Focus of larger retailers on private label development has led to evolution of three private label types, namely - generic private labels, copycat private labels and premium private labels (Kumar & Steenkamp, 2007). These types of private labels are positioned on the spectrum from low price and low quality to high price and high quality in order to focus on different consumer segments and to avoid brand cannibalization. Alongside aforementioned three types, retailers' increasingly develop specialized private labels (eg. Organic and Fairtrade private labels) with an aim to meet the new market trends and satisfy the needs and desires of the narrow consumer segments (de Jong, 2007).

In the last decade, private labels have, with their exponential growth, become a powerful threat to manufacturer brands (Bao, Bao & Sheng, 2011). However, private label development is not equal in all regions of the world. They are largely represented and most advanced in the developed countries of Western Europe and North America. On the other hand, in emerging markets of Central and Eastern Europe, such as Croatia, the share of private labels is still much lower and often does not exceed 10 per cent (The Nielsen Company Report, 2011). Never the less, emerging markets are constantly recording the highest private label growth rates, so it is expected that in the next few years their role in the market will be significant.

Giving the difference in development and consumer acceptance of private labels in different parts of the world, it is becoming all the more important to analyze private label management through prism of the product life cycle, as one of the most cited contributions to marketing theory. Every phase of the product life cycle entails different market circumstances which influence private label management on strategic and tactical level. This in turn influences private label success throughout phases of the product life cycle. Market success of private labels is in scientific papers expressed in numerous ways, such as through market share (Hoch & Banerji, 1993; Dhar & Hoch, 1997), purchase intent (Richardson et al., 1994; Dick et al., 1995; Baltas, 1997; Burton et al., 1998; Batra & Sinha, 2000; Miguel et al., 2002; Sheinin & Wagner, 2003; Veloutsou et al., 2004), positive perception (Dunn et al., 1986; DelVecchio, 2001; Liu & Wang, 2008) and favorable attitudes towards private labels (Burton et al., 1998; Sheinin & Wagner, 2003). Since consumer attitudes are formed at the beginning of product life cycle, use of private label attitude as a proxy for private labels success seems appropriate.

As stated before, private labels record the highest growth rate in developing and transitional countries. In those countries private labels are either on the beginning or at the growth stage in the product life cycle – phases crucial for their further market success so it is necessary and important to research the factors which can influence or hinder their acceptance by consumers. There are a lot of factors which can influence private label acceptance by consumers but at the beginning of their life cycle perceived risk can be accentuated as one of the most important. This is not surprising giving that retailers are not known for brand management so private labels are perceived as riskier alternative in relation to manufacturer brands. This perception is further highlighted by their positioning as cheaper alternative to established manufacturer brands. All retailers' in-

vestments in private label development and quality improvements may be in vain if the level of perceived risk associated with private labels is too high.

In this context, the purpose of the paper is to analyze attitudes towards private labels among consumers in Croatia, which are currently in the growth stage of the product life cycle (Steenkamp et al., 2010) and discuss implications perceived risk, associated with private labels, has on brand management strategies used by retailers.

2. APPLICATION OF PRODUCT LIFE CYCLE CONCEPT IN PRIVATE LABEL MANAGEMENT

The product life cycle concept is one of the most cited contributions to marketing theory (Palmer, 2005), but despite its great popularity and numerous advantages, in scientific papers relating to private labels it is hardly ever used. One reason may be the problem of different levels at which life cycle can be viewed as well as the fact that private labels are developed in a large number of different product categories. Likewise, international retailers need to follow separate private label life cycles in different markets, what further complicates its application.

Stage of the product life cycle is a good indicator of the primary demand and market competitiveness (Catry & Chevalier, 1974) which includes a variety of challenges, opportunities and problems, urging companies to modify brand management strategies (Kotler & Keller, 2007). Growth stage is especially significant because it is characterized by the development of selective demand which leads to formation of consumer buying habits as a necessary prerequisite for long-term loyalty (Bivainiene, 2010). Using an appropriate brand management strategy for private labels in the growth stage serves as a necessary precondition for their further successful development in other life cycle stages.

Regardless of whether it is observed in structural or quantitative terms, the product life cycle concept is focused on the analysis of product development in which the current position of the product discussed is compared in relation to its past and future. Each product can also be analyzed in relation to competitors' products as well as in relation to other products within the company, enabling the firm optimal resources allocation (Cox, 1967).

When considering the concept of life cycle it is necessary to clearly define the level at which it is being observed. In the literature product life cycle is analyzed at the demand level, industry level, product category level, product class level, product level and brand level (Wood, 1990). Although some authors question the application of product life cycle concept at the brand level, Vranešević (2007) believes that the brand life cycle is much more stable concept because the brand is not based only on satisfying generic consumer needs but also on the development of long-term relationships based on value. Brand management should strive to keep the brand in the early stage of maturity as long as possible through continuous development and adaptation to change and usually increasing expectations of consumers.

Simon (1979) defines the brand life cycle as a time series of a particular brand's sales volume, based on the relationship between consumers and the brand (Johnson et al., 2006 in Bivainiene, 2010). Unlike the product life cycle concept which is based on product's success according to the general market conditions, the brand life cycle is primarily based on consumers' attitudes and behavior. Despite that, the concept of the brand life cycle can not be viewed separately from the product life cycle, because product management in different life cycle stages directly affects activities required to develop and maintain a brand. Therefore it can be concluded that the stage of the product life cycle can serve as a basis for brand management in different stages of the brand life cycle (Bivainiene, 2010).

The classical theory of the product life cycle includes four chronological stages: introduction, growth, maturity and decline (Brassington & Pettitt, 2007) which differ according to level of market orientation and marketing strategies used. Market orientation, defined as focus on consumers and competition, is less important in the beginning of life cycle due to high level of market and technological turbulence. In the introduction stage demand is often inadequately defined because consumers still do not have firm expectations regarding new product/brand so it is difficult for a company to define consumer-oriented goals. The transition from the introduction stage to growth stage leads to change in company direction from production orientation to consumer orientation. Specifically, in the growth stage competitive struggle is all the more based on understanding of current and future customer needs in order to develop solutions that will be superior with regard to competition. In the maturity stage consumer preferences are stabilized, but increased competition intensity also increases the need for market orientation and the use of strategies that will allow the companies to exploit opportunities and avoid threats. The importance of market orientation is again reduced in the decline stage when companies primarily focus on rejuvenating products, or decide to exit from the market with minimal costs (Wong & Ellis, 2007). Empirical research done by Wong and Ellis (2007) confirmed that market orientation brings the highest benefits to companies in the growth stage of the product life cycle because market boundaries are still not strictly defined so the sales growth of one company will not endanger other and thus stimulate its defensive reaction. On the other hand, market orientation is the least significant in the introduction stage and it is better for managers in this stage to direct their resources to promotion of new product to innovators and early adopters. Growth stage of the product life cycle is characterized by a strong rise in sales as more consumers become aware of the product. Consumer base is expanding to early adopters (Lambin et al., 2007) and this is the stage in which consumers' form their buying habits so marketing becomes the most important element for market success (Mohan & Krishnaswamy, 2006). It is important that the company maintains a strong sales volume growth by attracting a greater number of consumers based on gathering information about their purchasing habits and needs. In private label management implementation of product life cycle concept could be crucial because they are most often introduced in product categories already in the growth or maturity stage. Brand management according to product life cycle concept can enable private labels to reach a leadership position in the market although they are not pioneers in the product category (Vranešević, 2007).

After the retailer decides to introduce private labels they pass through three stages of development: reactive, imitating and identity stage (Kapferer, 2010). The first stage occurs as a result of retailer's desire to achieve greater bargaining power in relation to manufacturers or the desire to fill the gaps in the assortment through category management. The second stage of private label development is imitating, in which retailers analyze competitive offers available on the market and develop private labels in the basic private label categories. At this stage, most retailers do not invest resources in the development of identity for their private labels but rather they copy packaging of leading manufacturer brands in a product category. In the final stage of the private label development, they achieve market success, so for retailers they become a real instrument of strategic differentiation that expresses identity, values and positioning creating consumer loyalty towards private labels, and consequently towards the retailer. This is generally the stage where retailers stop emphasizing lower price as the main advantage of private labels, but rather their uniqueness through presence in broad number of categories. Private labels in the last stage of development are brands in the true sense of the word through implementation of brand management based on differentiation, reputation development and investments in quality. These kind of private labels are also the most profitable because they enable the realization of the maximum market share with minimal price gap with regard to manufacturer brands (Kapferer, 2010).

The above explained stages of private label development indicate that in the introduction stage, retailers are primarily oriented toward competing on low prices which is not surprising if one takes into account that private labels are often introduced into categories with strong market leaders who have a broad base of customers and strong market position. So in order to compete, retailers are to some extent forced to use strategy which reflects the huge price gap between private labels and manufacturer brands in order to encourage consumers to notice and try private labels. On the other hand, private label management in the latter stages, namely in the growth stage of the product life cycle, is characterized by the trend of increased quality and relative prices of private labels in relation to manufacturer brands. Increase in their market share, which reflects the increasing level of acceptance by consumers, leads to decrease in the price gap so when private labels reach 50% market share price gap disappears (Wileman & Jary, 1997).

Retailers are expanding private label offer in the large number of product categories in order to achieve economies of scale and scope (Dhar & Hoch, 1997). However, retailers can not simultaneously achieve a strong market position in all categories, so it is necessary to designate investments in categories dominated by weak manufacturer brands or in the categories with the potential for their redefinition. Private labels have the highest probability of success in categories with fragmented competition, categories where manufacturer brands have weak market position, or categories that are dominated by few strong manufacturer brands which use strategies based on old image, and are characterized by insufficient levels of innovation and promotion. In addition, private labels' share is generally higher in categories characterized by a relatively stable technology, longer life cycle, and excess production capacity among producers whose brands are market followers. Retailers can through private labels redefine certain product categories to provide

added value, which increases the number of consumers who buy the products in the category as well as category sales volume and performance of private labels (Wileman & Jary, 1997).

All of the aforementioned elements of private label management indicate that in the growth stage of the product life cycle retailers are starting to develop private labels as brands. By applying an appropriate strategy for private labels in the growth stage retailers can ensure their success and even a leading position in certain product categories in the later stages of the product life cycle. However, in order to apply appropriate management strategies retailers should be familiar with the consumers' attitudes towards private labels as well as negative influence of perceived risk on attitudes in different product categories.

3. PRIVATE LABEL ATTITUDE

Attitude is the basis for many models of consumer behavior (Binninger, 2008) and is often used for segmentation, forecasting product acceptance in the market and the development of marketing programs (Vranešević et al., 2004). It can be defined as a favorable or unfavorable tendency toward the characteristics of a particular object, which will affect the tendency of consumers to behave predictably in relation to that object (Perry, 1969 in Anchor & Kourilová, 2009). Attitude always represents the relationship between an individual and the object or situation, and expresses the value in relation to those objects. As such it is relatively persistent trait that is not easily changed. Attitude is basically comprised of cognitive, emotional and behavioral components that together affect the fulfillment of the four basic functions: the utility function, ego-defensive function, value-expressing function and function of knowledge (Kesić, 2006).

Burton et al. (1998) define attitude towards private labels as predisposition to favorable or unfavorable response in relation to the product evaluation, purchase probability and self-evaluation associated with products under a private label. From this point of view, private label attitude seems to be a relatively durable construct that is broad enough to be generally used in various product categories. General private label attitude is an important factor in the evaluation of individual private labels attitude (Collins-Dodd & Lindley, 2003) as well as with regard to consumers intention to purchase private label (Chaniotakis et al., 2010).

Attitudes towards private labels are formed on the basis of certain perceived benefits that consumers expect, such as competitive pricing, efficiency or favorable price to quality ration. It is important to remember that private label attitude also differs among product categories. Sethuraman (2003) states that consumers have less favorable attitude towards private labels in non-food product categories because they perceive that the quality difference between private labels and manufacturer brands is higher than it really is. This can be explained by the fact that in food categories consumers can taste the product and thus better assess the quality of private labels compared to the quality of manufacturer

brands. On the other hand, the quality of non-food products is harder to assess, so consumers often use brand name as a signal of quality. Differences in attitudes towards private labels in different product categories were also confirmed by Boutsouki et al. (2008). Their research on the Greek market has shown that consumers are more inclined to purchase private labels in categories like paper products, canned foods, detergents and soft drinks, while the share of consumers inclined to purchase private labels in the cosmetics category was significantly lower. These results are not surprising giving that the private label market in Greece is still in the initial stages of its life cycle, which implies lower consumer familiarity with private labels and thus increased purchase risk (Steenkamp et al., 2010). Therefore retailers, introducing private labels should choose categories in which it is easy to evaluate product quality as well as categories with lower purchase risk levels (Mandhachitara et al., 2007).

4. PERCEIVED RISK

Since the level of (dis)satisfaction with the product can be known only after the act of purchase, consumers will inevitably be faced with uncertainty and perceived purchase risk (Mitchell, 1998). Bauer (1960 in Mitchell, 1999) was the first author who proposed concept of perceived risk stating that he was only interested in subjective or perceived risk and not "real world" (objective) risk. According to Bauer (1960 in Ross, 1975) perceived risk is not only related to consumers' information acquisition and processing activity but to post-decision processes as well, where people will seek out information that confirms the wisdom of their decision.

In traditional methodology based on Bauer's conceptualization, risk is measured by two components: uncertainty and consequences of purchase mistake (González Mieres et al., 2006b). Narasimhan and Wilcox (1998) take a similar approach in which risk is defined as the negative utility that occurs because the product did not live up to expectations multiplied by the probability this will occur. Accordingly, risk might be reduced to a tolerable level by (1) reducing the amount at stake or penalties for failure or by (2) increasing the degree of certainty that loss will not occur (Ross, 1975). In the case of private label, perceived risk is expected to have additional negative influence because private labels are dominantly compared with leading manufacturer brands. In that sense, consumers often choose well known manufacturer brand which they trust in order to increase the degree of certainty that loss will not occur.

Dunn et al. (1986) define perceived risk as the expected negative utility associated with purchase of a product or a brand. The same authors distinguish two specific risk levels: an inherent risk which is manifested at the product category level and handled risk that influences consumer behavior at the brand level. For private label management, analysis of purchase risk at the category level is particularly important because in product categories with low level of perceived risk consumers will be keener on facing uncertainty in buying private label. Sinha and Batra (1999) define risk of a product category as subjective probability of incorrect selection of products in the category multiplied by the

perceived consequences of such a wrong purchase. In their following paper, Batra and Sinha (2000) came to a conclusion that purchase risk at a category level is composed of three determinants: the degree of discomfort associated with the wrong purchase, the probability of purchase mistake due to quality variability in a specific category and the degree to which product can be evaluated based on available information or experience with the product. Although consumers perceive difference in risk level between private labels and manufacturer brands, both entail some degree of perceived risk which differs between product categories. So, consumers will perceive higher level of perceived risk in baby food category than in toilet paper category, for both manufacturer brands and private labels. In that sense we hypothesize that private label perceived risk follows the same pattern of general category perceived risk.

H1   Perceived risk of private labels follows the pattern of general category perceived risk.

Purchase risk is not one-dimensional construct. Jacoby and Kaplan (1972) propose a wide conceptualization of perceived risk at the brand level by defining six varieties of perceived risk: financial risk, performance risk, physical risk, psychological risk, social risk and overall perceived risk. Financial risk is measured as a chance that consumer will lose money by trying unfamiliar brand either because it won't work or because it costs more than it should to keep it in good shape. Performance risk is measured by the likelihood that there will be something wrong with unfamiliar brand or that it will not work properly. Physical risk denotes the chance that the unfamiliar brand may not be safe i.e. may be (or become) harmful for the consumer's health. Psychological risk represents the chance that unfamiliar brand will not fit well with consumer's self-image while social risk measures the chance that unfamiliar brand will affect the way others view the consumer. Finally, overall perceived risk presents consumers' evaluation of risk in buying unfamiliar brand taking into account all aforementioned factors combined.

Zielke and Dobbelstein (2007) have studied purchase risk at the product category level and stated that it consists of financial risk, functional risk and social risk. Financial risk of a specific product category is defined as potential financial loss incurred as a result of the wrong purchases. As such, financial risk depends on the price level of each product category in a way that greater financial risk is associated with more expensive category. Functional risk of a product category can be defined as the potential loss arising from inadequate product quality and is particularly evident in the non-food categories in which consumers buy products that fulfill a specific function. Finally, the social risk refers to the loss of image or prestige as a consequence of use/consumption of certain products. Social risk is particularly significant in the categories that are used or consumed in public or offered to guests. The approach to perceived risk as proposed by Zielke and Dobbelstein (2007) is adopted later in the empirical research giving that private labels are analyzed at the product category level.

The level of risk associated with private labels is crucial in determining consumer preferences towards them (Gonzalez Mieres et al., 2006a) especially in the early stages of the

product life cycle. When it comes to private labels, purchase risk is usually evaluated in relation to manufacturer brands. Giving that private labels are positioned as cheaper alternatives to established manufacturer brands (González Mieres et al., 2006b) comparison leads to inferior perception of private labels and decrease in likelihood of their purchase. Richardson et al. (1996) have empirically shown that the perception of private labels as riskier alternatives in relation to the manufacturer brands has a negative impact on consumers' purchase intentions with regard to private labels. Similarly, Erdem et al. (2004) showed that the reduction of difference in perceived quality and perceived risk between private labels and manufacturer brands may lead to increased likelihood of private label purchase. Therefore we hypothesize that perceived risk will have negative influence on private label attitude regardless of the product category.

H2   Perceived risk has negative influence on private label attitude regardless of the product category.

Difference in perceived risk between private labels and manufacturer brands is particularly evident for functional component of perceived risk (Gonzalez Mieres et al., 2006a). This is due to the fact that for retailers production is not a primary activity so consumers sometimes doubt the quality of private label, especially in the early stages of the product life cycle. According to the results of empirical study all three previously identified risk components are reducing consumers' proneness to private labels. However analysis shows that social risk has the most pronounced negative impact on private label proneness, followed by functional risk. Financial risk has the smallest negative impact what is logical giving that the prices of private labels are typically lower than prices of manufacturer brands (Zielke & Dobbelstein, 2007). Based on aforementioned findings we hypothesize that all risk components have negative influence on private label attitude regardless of the product category.

H3   All risk components have negative influence on private label attitude regardless of the product category.
     H3a   Functional risk has negative influence on private label attitude regardless of the product category.
     H3b   Financial risk has negative influence on private label attitude regardless of the product category.
     H3c   Social risk has negative influence on private label attitude regardless of the product category.

The results of previous studies also suggest that perceived risk varies depending on the product category (Glynn & Chen, 2009) and that the risk associated with the product category affects the success of private labels (Sinha & Batra, 1999). In every product category there are different aspects of purchase risk which affect the propensity toward buying new private labels. Research by Dunn et al. (1986) showed that consumers perceive a higher degree of functional risk in ice cream category in relation to the laundry detergents. Similarly, Prendergast and Marr (1997) have demonstrated that consumers evaluated private labels in categories such as rice and paper tissues more positively than

in categories such as shampoos and coffee. Categories that are traditionally perceived as generic, reported a smaller difference in quality between private labels and manufacturer brands and hence smaller perceived risk.

Investigating perceived risk influence on consumer attitude to private labels in the product's life cycle growth stage, presented in the next chapter, has enabled the connection of existing theories. The way in which and how perceived risk influences consumer attitude with regard to private labels needs to be studied across time and stages of product life cycle as well as at the level of different product categories.

5. RESEARCH

This chapter describes the main quantitative study conducted for the purpose of the paper, as well as all preparations done before conducting the research itself. The quantitative methodology was chosen on the basis of a large number of scientific papers in the fields of private labels (eg, Dick et al., 1996; Batra & Sinha, 2000; Apelbaum et al., 2003; Hsu & Lai, 2008) that showed this approach is appropriate.

5.1. Preliminary studies

Since the aim of the research was to comprehend consumer attitudes towards private labels in different product categories, it was necessary to determine three product categories which would be studied in the final research. Two initial assumptions were taken into account in category selection:
(1) private labels in a chosen category have to be in the growth stage of the product life cycle;
(2) chosen categories have to differ in the degree of perceived risk.

In order to determine categories in the growth stage of the life cycle, qualitative research through in-depth interviews with 16 Croatian experts in the field of private label management was conducted. Qualitative method was selected based on the methodology from Thietart and Vivas (1984). Experts selected for interviews were employees of retailer companies that own private labels in Croatia and employees from manufacturing companies that produce private labels and national brands. Respondents were selected using a snowball sample in order to ensure participation of people who manage private labels on a daily basis and therefore have broad knowledge of the research problem. In total 10 in-depth interviews was conducted with representatives of retail chains, who according to the Croatian Chamber of Economy hold more than 2/3 of the market share in Croatian retail market. Additional 6 interviews were conducted with manufactures in order to provide holistic insights into private label management.

All respondents were asked to state product categories which are, according to their knowledge, in the growth stage of the product life cycle. On the basis of qualitative re-

search, 24 product categories were defined in which private labels were in the growth stage of the product life cycle, thus fulfilling the first assumption. Those product categories were: chips, chocolate, chocolate truffles, dish soap, laundry detergent, baby food, pet food, coffee, biscuits, dairy products, milk, paper towels, diapers for children, beer, hair care products, frozen food, beverages, household cleaning agents, sunscreen, liquid soap, wine, facial care products, toilet paper and toothpaste.

In order to fulfill the second assumption, which says that three chosen categories must differ on the basis of the perceived risk level, a survey on a convenience sample of 79 respondents was conducted. The aim of the survey was to assess the perceived risk level in all of the aforementioned 24 product categories. The study was conducted using a questionnaire in which respondents were asked to express the level of risk associated with buying a product from an unknown manufacturer in all analyzed categories using 7 degrees Likert type scale in such a way that 1 represented "extremely low risk" and 7 "extremely high risk". Mean analysis that indicates the level of perceived risk for each product category is shown in Table 1.

Table 1: *Mean values of perceived risk in different product categories*

PRODUCT CATEGORY	MEAN VALUE	QUARTILE
Baby food	6.34	
Sunscreen	5.75	
Facial care products	5.75	
Dairy products	5.67	
Milk	5.54	
Diapers for children	5.33	Q3 = 5.17
Frozen food	5.00	
Beverages	4.90	
Hair care products	4.84	
Toothpaste	4.75	
Chocolate truffles	4.58	
Chocolate	4.54	
Wine	4.44	
Coffee	4.42	
Biscuits	4.41	Q2 = 4.49
Laundry detergent	4.41	
Chips	4.29	
Beer	4.16	
Household cleaning agents	3.91	Q1 = 4.04
Dish soap	3.89	
Pet food	3.80	
Liquid soap	3.35	
Toilet paper	3.09	
Paper towels	2.53	

Source: Authors' research

All categories studied were arranged on the basis of perceived risk level, after which first, second and third quartiles were defined in order to form three groups of product categories with different perceived risk levels. Six product categories with a perceived risk mean value smaller than the value of first quartile (4.04) comprise low risk level group. 12 product categories with mean values between first and third quartile make up medium level risk group. The last six categories with mean values higher than third quartile (5.17) represent the high risk level categories.

From the product group with the lowest risk level, liquid soap was selected for further research despite the facts that toilet paper and paper towels have lower mean values of perceived risk. Specifically, these are the product categories that are largely generic and there is no possibility for significant brand differentiation what makes it difficult for consumers to assess differences between brands. Unlike them, liquid soap can be estimated in several dimensions – smell, texture, color and so on. In the medium risk level group, chocolate was chosen for further research giving that this product category is represented in the assortment of most retailers in Croatia. Additional reason for choosing chocolate is that this product category is bought by different consumer segments. From the high risk level group, face care product were selected for further research, despite the fact that baby food category and sunscreen products had higher average value of perceived risk. Baby food was not selected because not all retailers in Croatia have private labels developed in this category. Besides that, baby food is usually bought by a narrow consumer segment what would unnecessarily limit consumer sample and thus reduce the possibility of research results generalization. Sunscreen category was not selected because of the seasonal nature of demand. Specifically, since sunscreen is mostly bought during the summer, there was concern that it would be difficult for consumers to express their opinions on these products in December when research was conducted. In order to verify statistically significant difference in the level of perceived risk between selected product categories, analysis of variance - ANOVA was conducted whose results are shown in Table 2.

Table 2: *Results of statistical analysis of differences in mean value of perceived risk in different product categories*

PRODUCT CATEGORY	MEAN VALUE	STANDARD DEVIATION
Liquid soap	3.35	1.61
Chocolate	4.54	1.62
Facial care products	5.75	1.56
ANOVA: F=44,33714 p=0,000000		

Source: Authors' research

The table shows that at the level of significance equal to zero, observed differences between mean values estimates of perceived risk are significantly different which proves that the category selection is justified.

Table 3: *Results of one sample t-test*

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Liquid soap	18.52	78	,00	3.35	2.99	3.72
Chocolate	24.88	78	,00	4.54	4.18	4.91
Facial care products	32.82	78	,00	5.75	5.40	6.10

Source: Authors' research

Results of one sample t test also confirm that the observed differences between mean values estimates of perceived risk are significantly different. Therefore, selected product categories are eligible for further studies.

5.2. Main study

As it was stated before, the aim of the research was to comprehend consumer attitudes towards private labels in different product categories in the growth stage of the product life cycle and asses the influence perceived risk has on attitudes towards private labels. The study was conducted using a questionnaire which consisted of series of statements to which respondents expressed their agreement or disagreement using Likert-type scales. Likert type scale is used to measure attitudes toward certain concepts (McDaniel and Gates, 2008) and is therefore suitable for use in research into attitudes towards private labels. Statements were taken from existing literature and translated to Croatian. A scale for perceived risk was designed according to the Sheinin and Wagner (2003). A scale for measuring attitudes towards private labels was developed according to papers from Burton et al (1998) and Lymperopoulos et al (2010). A scale of 7 degrees was used to measure attitudes and risk whereby 1 denoted "strongly disagree" and 7 is "strongly agree." Respondents expressed their (dis)agreement for each claim individually since Likert-type scale does not provide the possibility of multiple responses.

With the objective of pre-testing comprehensibility and appropriateness of the measuring instrument, a pre-test was conducted on a sample of 86 graduate students at the Faculty of Economics and Business, University of Zagreb. Students filled out questionnaires, but were also asked to indicate possible ambiguities for individual statements or other elements of the questionnaire. All comments respondents gave during pre-testing were discussed among authors after whom statements were modified.

The main study was conducted in December 2011 on the convenience sample of 841 respondents whose characteristics are shown in Table 4.

Table 4: *Distribution of respondents by demographic characteristics*

CHARACTERISTIC	NUMBER OF RESPONDENTS	PROPORTION OF RESPONDENTS
Gender		
Female	586	69.7%
Male	248	29.5%
Age		
15 – 25	282	33.5%
26 – 35	270	32.1%
36 – 45	139	16.5%
46 – 55	94	11.2%
56 – 65	33	3.9%
66 +	21	2.5%
Education		
Uncompleted primary school	2	0.2%
Completed primary school	35	4.2%
Completed high school	354	42.1%
College or university degree	328	39.0%
Master's or doctorate degree	121	14.4%
Average monthly income of a household		
up to 4.000 HRK	104	12.4%
4.001 – 8.000 HRK	283	33.7%
8.001 – 15.000 HRK	315	37.5%
more than 15.000 HRK	137	16.3%
Number of household members		
1.00	66	7.8%
2.00	177	21.0%
3.00	176	20.9%
4.00	255	30.3%
5.00	120	14.3%
6 +	46	5.5%

Source: Authors' research

The survey was conducted in person and via the Internet electronic survey. A total of 398 responses were collected through personal interviews with respondents, chosen according to their availability in high traffic areas, promenades and shopping centers. The remaining 443 responses were collected through online research using software Survey Methods. Dual research methods were used in order to obtain wider consumer sample and ensure additional sample variety. Respondents who participated in online research were mostly younger and with above average education so additional personal interviews were conducted with respondents of different demographic characteristics. Questionnaire used in research was self-administered and the same regardless of the research method used.

5.3. Data analysis

In the analysis of empirical data collected, a number of statistical techniques and methods were used. All data analysis was performed using statistical package Statistica 6.0 and PASW Statistics 18. To test the convergent validity, factor analysis was conducted. It is considered that the measurement scale has convergent validity if the claims that form the scale have high factor loadings on the same factor, and low factor loadings on other factors. Variables that did not meet the above criteria and had high loading on multiple factors are extracted from the analysis.

Results of the factor analysis show that, based on the Kaiser-Guttman rule, two factors that have intrinsic value greater than 1 were extracted, namely attitudes towards private labels in a product category (factor 1) and the perceived risk of private labels in the product category (factor 2). Results of the factor analysis were the same for all three product categories analyzed. Distinguished factors explained 61.4% of the total variance in the liquid soap category, 59% of variance in the chocolate category and 57,9% variance in the facial care products category.

Reliability of measurement scales was primarily analyzed using the Cronbach alpha coefficient and the convergent validity was tested using exploratory factor analysis. Alongside Cronbach alpha coefficients, indicators "alpha-if-deleted" were also calculated to identify statements that reduced Cronbach alpha coefficient value and these statements were eliminated from the analysis (Churchill, 1979). The statements which were retained for further analysis are stated in Table 5.

Table 5: *Items used in the final measuring instrument*

CONSTRUCT	SCALE ITEMS	AUTHOR
Private label attitude	Buying private label brands makes me feel good. I love it when private label brands are available for product category I purchase. For most product categories, the best buy is usually the private label brand. My attitude towards retail brands in a category is positive.	Burton, Lichtenstein, Netemeyer, & Garretson, 1998 Lymperopoulos, Chaniotakis & Rigopoulou, 2010
Perceived private label risk	Considering the monetary investment associated with purchasing category, I consider purchasing private labels to be risky. Considering that people judge me by the brand of category that I use, I consider purchasing private labels to be risky. Considering how I like to feel after using category, I consider purchasing private labels to be risky.	Sheinin & Wagner, 2003

Cronbach alpha coefficient values for defined measuring constructs at the level of analyzed categories are shown in the table 6.

Table 6: *Cronbach alpha coefficient values for defined measuring constructs at the category level*

CONSTRUCT	PRODUCT CATEGORY	CRONBACH ALPHA COEFFICIENT VALUE
	Liquid soap	0.81
Private label attitude	Chocolate	0.80
	Facial care products	0.80
	Liquid soap	0.61
Perceived private label risk	Chocolate	0.60
	Facial care products	0.62

Source: Authors' research

Cronbach alpha value for both constructs and in all categories are at the acceptable level what suggests that defined constructs can be used further in the analysis.

5.4. Research results

Attitudes and level of perceived risk of private labels were analyzed at the product category level. Table 7 shows the mean values for attitudes towards private labels and the degree of perceived risk at the product category level.

Table 7: *Mean values of private label attitudes and perceived risk in various categories*

Product category	The attitudes toward private labels in the category		Perceived risk of private labels in the category	
	Mean value	p-value	Mean value	p-value
Liquid soap	4.5	0.000	3.1	0.000
Chocolate	3.9	0.000	3.7	0.000
Facial care products	3.6	0.000	4.0	0.000

Source: Authors' research

It is evident that the mean value of perceived risk increases which means that consumers perceive the lowest risk in buying private labels in the liquid soap category (3.1), higher risk when buying chocolate (3.7), and the highest risk in the facial care products category (4.0). On the other hand, mean values of consumer attitudes to private labels are moving in the opposite direction which means that consumers have the best attitude about private labels in the liquid soap category (4.5), less positive in the chocolate category (3.9) and the least positive attitude in the facial care products category. The differences in mean values for attitude and perceived risk were tested and results are shown in Table 7. Since p-values are smaller than 0.001 for all combinations of perceived risk and attitudes at the product category level, it can be concluded that the differences between them is statistically significant. Results shown in table 7 corroborate hypothesis H1 stating that private label perceived risk follows the pattern of general category perceived risk i.e. private label perceived risk increases with an increase in product category risk level.

In order to determine the influence of perceived risk on attitude towards private labels, correlation analysis was conducted. Correlation coefficients between the attitudes towards private labels perceived risk at the product category level are presented in Table 8.

Table 8: *Correlation matrix between attitudes and perceived risk of private labels in different product categories*

Product category	Correlation coefficient
Liquid soap	-0.28
Chocolate	-0.17
Facial cream products	-0.18

Source: Authors' research

The correlation between attitude and risk is negative as expected, but an unexpected result is that the correlation is higher in the category of liquid soap compared to chocolate and facial care products categories. As hypothesized, perceived risk has a negative influence on private label attitude regardless of the product category. Thus hypothesis H2 can be accepted.

In order to obtain a better insight into the nature of influence perceived risk has on the attitudes towards private labels additional analysis was conducted in which perceived risk was analyzed through three components - functional, social, and financial risk measured as a single item construct shown in table 5. Multiple regression analysis was chosen because it analyzes the impact of a number of independent on a dependent variable (Diamantopoulos & Schlegelmilch 2000). In regression, components of perceived risk were used as independent variables while attitude toward private labels was used as a dependent variable. Results of multiple regression analysis are depicted in tables 9, 10 and 11.

Table 9: *Multiple regression analysis results in liquid soap category*

	Beta	Std. Err. of Beta	B	Std. Err. of B	t(829)	p-level
Intercept			5,453036	0,117593	46,37196	0,000000
Functional risk	-0,264929	0,036543	-0,209001	0,028829	-7,24969	0,000000
Financial risk	-0,089940	0,038234	-0,076328	0,032447	-2,35235	0,018888
Social risk	-0,022230	0,035595	-0,016332	0,026151	-0,62452	0,532456

R= ,32163218 R2= ,10344726 Adjusted R2= ,10020280 F(3,829)=31,884 p<0,0000 Std. Error of estimate: 1,3445

Source: Authors' research

In the liquid soap category functional risk and financial risk have significant negative influence on attitudes towards private labels while social risk has no influence. This result is not surprising if we take into account that liquid soap is a product used in consumers' homes and is not highly visible to others in order to induce social risk. Influence of financial risk is low as expected giving that private labels in this category have lower

prices compared to national brands and that purchase of liquid soap does not require high monetary investment.

Table 10: *Multiple regression analysis results in chocolate category*

	Beta	Std. Err. of Beta	B	Std. Err. of B	t(834)	p-level
Intercept			4,668860	0,138552	33,69765	0,000000
Functional risk	-0,324617	0,034434	-0,239835	0,025441	-9,42710	0,000000
Financial risk	0,005215	0,035462	0,004203	0,028579	0,14705	0,883127
Social risk	0,089090	0,034242	0,064204	0,024677	2,60178	0,009439

R= ,32227126 R2= ,10385876 Adjusted R2= ,10063523 F(3,834)=32,219 p<0,0000 Std. Error of estimate: 1,3033

Source: Authors' research

Analysis at the chocolate category level reveals that functional and social risks have significant influence on private label attitude while financial risk has no influence. Surprisingly, results show that social risk has very small but positive influence on private label attitude. These results are contradictory to results of qualitative research conducted on Croatian market where most consumers have stated that they would not use private labels in front of others or give them as a gift because they would be ashamed. Giving these contradictory results interrelation between social component of perceived risk and private label attitude should be analyzed in more detail.

Table 11: *Multiple regression analysis results in facial care products*

	Beta	Std. Err. of Beta	B	Std. Err of B	t(831)	p-level
Intercept			4,463677	0,141435	31,56001	0,000000
Functional risk	-0,295279	0,034922	-0,209456	0,024772	-8,45544	0,000000
Financial risk	-0,015336	0,035419	-0,011094	0,025623	-0,43299	0,665135
Social risk	0,054320	0,034239	0,036181	0,022806	1,58649	0,113008

R= ,29577277 R2= ,08748153 Adjusted R2= ,08418724 F(3,831)=26,556 p<,00000 Std. Error of estimate: 1,3042

Source: Authors' research

In the facial care category functional risk is the only component of perceived risk which has significant influence on private label attitude. Results shown in tables 9-11 indicate that hypothesis H3a can be accepted but the other two supporting hypothesis (H3b i H3c) have to be rejected. Because two out of three supporting hypothesis are rejected the main hypothesis H3 also has to be rejected.

These results can to some extent be misleading because they suggest that perceived risk, unlike previous findings, has greater influence in low risk categories like liquid soap compared to higher risk categories like chocolate and facial care products. However, the results can be interpreted in a different way because they show that perceived risk has higher impact in categories in which consumers have positive attitudes towards private

labels so they consider them as an alternative in making a purchase decision. If consumers do not consider private labels as a viable alternative in chocolate or facial care product categories they do not engage in risk assessment for private labels. It is therefore important for retailers to decrease perceived private label risk in low risk categories because if consumers realize private labels in those categories are of appropriate quality they will be more keen in considering private labels as an alternative in higher risk categories.

Chocolate and especially facial care products are product categories in which consumers use more variables when assessing brand value what can offset perceived risk influence on purchase decision. Consequently retailers must consider different aspects of brand development in categories with higher level of perceived risk. Perceived risk will always be present in those kind of categories but retailers' can decrease it by developing sophisticated packaging, providing evidence of high product quality level, using celebrities to endorse the brand etc.

5.5. Discussion and Research Implications

Conducted empirical studies have largely confirmed the theoretical assumptions outlined at the beginning of the paper. The research results showed that consumers associate certain level of perceived risk in evaluating private labels. This result is not surprising giving the fact that retailers have no previous experience in production and they appear in the role of brand owner responsible for all aspects of brand management. Consumers often do not know who produces products under a private label, which certainly increases the perceived risk and reduces their likelihood of purchase. It is therefore important that retailers "educate" consumers and make them understand that in development and production of private labels quality raw materials are used and that there are strict quality controls throughout entire manufacturing process. It is difficult to expect that consumers will immediately have confidence in private labels. However, investments in their quality, using private label strategies based on value and not on price, as well as ongoing consumer education can be very important for their future success. Such a strategy requires a large investment in design and product development, quality control and development of long-term relationships with suppliers to ensure quality consistency and development of innovative products that are instigated by market needs and modern trends. By applying these strategies in private label management, they can become brands in the true sense of the word: consumers will not evaluate brands on who manages the brand, but rather on the basis of their value for the consumer.

Analysis at the product category level confirmed that consumers do in fact perceive different levels of perceived risk among different product categories. As expected, consumers perceive the lowest level of perceived risk in liquid soap category, somewhat higher in chocolate category and the highest risk level in facial care product category. These results are consistent regardless is the research conducted at the general or private label level, as shown in prestudy and main study. On the other hand in product categories with higher level of perceived risk consumers' exhibit more negative attitudes compared to lower risk

categories and are therefore more likely to accept private labels as a viable alternative. For retailers this finding is particularly important because it implies that they have to pay special attention to quality of private labels in low risk categories. These categories are sometimes unjustly neglected by retailers because they are not highly profitable but that strategy can be contra productive giving that these are the categories consumers first come in contact with private labels. If private labels in low risk categories are not of adequate quality it would be all the more difficult to convince consumers that quality of private labels in higher risk categories is acceptable.

Aforementioned conclusion is also based on the more in-depth analysis of different risks levels associated with private labels in different product categories. Analysis shows that functional risk has the highest negative impact on private label attitudes in all analyzed product categories. Functional risk is also the only risk component which proved significant across categories. This finding implicates that consumers are still not convinced that retailers are always able to offer products of acceptable quality. One explanation for this kind of reasoning can be found in aforementioned inexperience of retailers in production and brand management and other can be found in low private label prices. High price gap between private labels and manufacturer brands raises doubts about quality of lower priced private labels.

As for the other risk components, financial risk was found to have small negative influence on private label attitude in liquid soap category. Liquid soap is a product essential for everyday hygiene and is often purchased so consumers associate certain level of financial risk with private labels although compared to manufacturer brands private labels have lower price.

Surprisingly, social risk component was found to have minimal but positive influence on private label attitude. Giving that this finding is contrary to all previous research findings additional research is needed to comprehend what is behind this result. One explanation can arise from methodology used because private labels were examined at the general level and some research indicate that consumers in Croatia perceive private labels of foreign retailers as superior compared to domestic ones. Another problem can be that consumers do not even perceive some private labels as private labels but rather as foreign manufacture brands. This can also apply to facial care products category where only functional risk has significant influence on private label attitude.

5.6. Research limitations

Combined method of data collection can be considered as a first research limitation. Combination of personal interviews and internet survey was used in order to reach more heterogeneous sample what would not be possible, giving the limited resources available, with one research method. Specifically, younger respondents and respondents with higher levels of education mostly responded to the internet survey while older or less educated respondents with lower income were reached through individual interviews.

Analysis on both samples revealed that there are some differences in the level of private label attitude and perceived risk but these differences can also arise from difference in demographic characteristics of respondents and do not necessarily present research bias. Therefore authors have concluded to treat the sample as a single sample although that poses another research limitation.

Convenience sample used can also be considered as a research limitation. Despite large number of respondents who participated in the research, convenience sample precludes generalization of the results because it is not based on probability. Also, younger respondents, as well as respondents with higher level of education, were disproportionally represented in the sample with regard to demographic structure of Croatian citizens. Despite aforementioned limitations, a large sample still allows for relevant conclusions.

Number of categories analyzed in the research is also a limitation. In order to gain deeper understanding of influence perceived risk has on private label attitudes it is necessary to conduct additional studies that would involve some other product categories. The research results indicate that the attitude of the private labels varies among categories of varying degrees of risk, but further studies are necessary to confirm the knowledge specified in as many product categories.

6. CONCLUSION

Private labels in Croatia are, on an industry level, in the growth stage of the product life cycle. This fact is especially important for retailers because the appropriate marketing strategy at this stage can have a significant impact on the success of private labels in the later life cycle stages. Analysis of private label development on Croatian market follows the three stages described by Kapferer (2010): reactive, mimicking and the stage based on the identity development. In the first stage, retailers have used private labels as a tool to achieve greater bargaining power with manufacturers and were focused only on achieving the lowest price regardless of the quality level. Such focus resulted in negative consumer attitudes to private labels which were perceived as cheap products with low and variable quality due to frequent changes of manufacturers. The second stage called mimicking is based on the development of private labels in as many product categories as possible. Most retailers follow similar development pattern, which leads to development of basic private labels categories. At this stage, most retailers do not invest resources in the identity development for their private label but rather use copycat strategy trying to imitate packaging of leading national brands in the product category. A large number of retailers which develop private labels on Croatian market are currently in this stage of their development. This especially applies to domestic retailers who, in contrast to foreign retailers, had no previous experience in the private label development. Retailers which have realized the true significance of private labels have already reached the third stage of development where they use private labels as a real instrument of strategic differentiation through the expression of their own identity and associated values which creates consumer loyalty towards private labels, and consequently towards the retailer

itself. This is generally the stage where retailers, as the main advantage of private labels, do not emphasize the lower price, but the concept of private labels itself which delivers greater value to the consumer through the optimal price-quality ratio (Kapferer, 2010). Private labels, which are managed in this way, have greater value in the eyes of consumers and are therefore more profitable despite greater investments needed.

It is encouraging for retailers in Croatia that consumer attitudes towards private labels are not negative, but are predominantly indifferent, and in the low risk categories even positive. This result indicates that in the growth stage of the life cycle consumers are starting to accept private labels and their market presence. Consumers will not necessarily buy private labels in categories with higher levels of purchase risk because they lack confidence in their quality; however, the mere fact that they are considering private labels as an alternative in their purchase decision is reassuring for retailers. The main goal of retailers, at this point of private label development, is to find a way to turn consumers' indifferent attitudes to positive ones, thus ensuring the success of private labels in the subsequent stages of the product life cycle.

LITERATURE:

Anchor, J. R. & Kourilova, T. (2009). Consumer perceptions of own brands: international differences. *Journal of Consumer Marketing*, 26 (6), 437-449.

Apelbaum, E., Gerstner, E. & Naik, P. A. (2003). The effects of expert quality evaluations versus brand name on price premiums. *Journal of Product & Brand Management*, 12 (3), 154-165.

Baltas, G. (1997). Determinants of store brand choice: a behavioral analysis. *Journal of Product & Brand Management*, 6 (5), 315-324.

Bao, Y., Bao, Y. & Sheng, S. (2011). Motivating purchase of private brands: Effects of store image, product signatureness and quality variation. *Journal of Business Research*, 64, 220-226.

Batra, R. & Sinha, I. (2000). Consumer-Level Factors Moderating The Success Of Private Label Brands. *Journal of Retailing*, 76 (2), 175-191.

Binninger, A.-S. (2008). Exploring the relationships between retail brands and consumer store loyalty. *International Journal of Retail & Distribution Management*, 36 (2), 94-110.

Bivainiene, L. (2010). Brand Life Cycle: Theoretical Discourses. *Economics and Management*, 15.

Boutsouki, C., Zotos, Y. & Masouti, Z. (2008). Consumer Behaviour towards Own Label: monitoring the Greek experience. *Agricultural Economics Review*, 9 (1), 81-92.

Brassington, F. & Pettitt, S. (2007). *Essentials of Marketing* (2nd ed.). Harlow: Pearson Education Limited.

Burton, S., Lichtenstein, D. R., Netemeyer, R. G. & Garretson, J. A. (1998). A Scale for Measuring Attitude Toward Private Label Products and an Examination of Its Psychological and Behavioral Correlates. *Journal of the Academy of Marketing Science*, 26 (4), 293-306.

Catry, B. & Chevalier, M. (1974). Market Share and the Product Life Cycle. *Journal of Marketing*, 38 (4), 29-34.

Chaniotakis, I. E., Lymperopoulos, C. & Soureli, M. (2010). Consumers' intentions of buying own-label premium food products. *Journal of Product & Brand Management*, 19 (5), 327-334.

Churchill, G. A. Jr. (1979). A Paradigm for Developing Better Measures of Marketing Constructs. *Journal of Marketing Research,* 16 (1), 64-73.

Collins-Dodd, C. & Lindley, T. (2003). Store brands and retail differentiation: the influence of store image and store brand attitude on store own brand perceptions. *Journal of Retailing and Consumer Services,* 10, 345-352.

Cox, Jr., W. E. (1967). Product Life Cycles as Marketing Models. *The Journal of Business*, 40 (4), 375-384.

DelVecchio, D. (2001). Consumer perceptions of private label quality: the role of product category characteristics and consumer use of heuristics. *Journal of Retailing and Consumer Services*, 8, 239-249.

De Jong, K.A.D. (2007). *Private Labels in Europe.* Vught: International Private Label Consult BV.

Dhar, S. K. & Hoch, S. J. (1997). Why Store Brand Penetration Varies by Retailer. *Marketing Science,* 16 (3), 208-227.

Diamantopoulos, A. & Schlegelmilch, B. B. (2000). *Taking the Fear Out of Data Analysis.* London: Thomson Learning.

Dick, A., Jain, A. & Richardson, P. (1995). Correlates of store brand proneness: some empirical observations. *Journal of Product and Brand Management*, 4 (4), 15-22.

Dick, A., Jain, A. & Richardson, P. (1996). How consumers evaluate store brands. *Journal of Product & Brand Managemenet*, 5 (2), 19-28.

Dunn, M. G., Murphy, P. E. & Skelly, G. U. (1986). Research Note: The Influence of Perceived Risk on Brand Prerefence for Supermarket Products. *Journal of Retailing,* 62 (2), 204-216.

Erdem, T., Zhao, Y. & Valenzuela, A. (2004). Performance of Store Brands: a Cross-Country Analysis of Consumer Store-Brand Preferences, Perceptions and Risk. *Journal of Marketing Research*, 41, 86-100.

Glynn, M.S. & Chen, S. (2009). Consumer-factors moderating private label brand success: further empirical results. *International Journal of Retail & Distribution Management*, 37 (11), 896-914.

González Mieres, C., Diaz Martin, A. M. & Trespalacios Gutiérrez, T. (2006a). Influence of perceived risk on store brand proneness. *International Journal of Retail & Distribution Management*, 34 (10), 761-772.

González Mieres, C., Diaz Martin, A. M. & Trespalacios Gutiérrez, T. (2006b). Antecedents of the difference in perceived risk between store brands and national brands. *European Journal of Marketing*, 40 (1/2), 61-82.

Herstein, R. & Gamliel, E. (2004). An Investigation of Private Branding as a Global Phenomenon. *Journal of Euromarketing*, 13 (4), 61-63.

Hoch, S. J. & Banerji, S. (1993). When Do Private Labels Succeed?. *Sloan Management Review*, 34 (4), 57-67.

Hsu, H.-C. & Lai, C.-S. (2008). Examination of Factors Moderating the Success of Private Label Brands: A Study of the Packaged Food Market in China. *Journal of Food Products*, 14 (4), 1-20.

Jacoby, J. & Kaplan, L. B. (1972). The Components of Perceived Risk. *SV-Proceedings of the Third Annual Conference of the Association for Consumer Research,* Association for Consumer Research, 382-393.

Kapferer, J. N. (2010). *The New Strategic Brand Management* (4th ed.). London, UK: Kogan Page.

Kesić, T. (2006). *Ponašanje potrošača*. Zagreb: Opinio.

Kotler, P. & Keller, K. L. (2007). *Upravljanje marketingom* (12. izdanje). Zagreb: Mate.

Kumar, N. & Steenkamp, J.B. (2007). *Private Label Strategy: turning the retail brand threat into your biggest opportunity*. Boston, Massachusetts: Harvard Business School Press.

Lambin, J.-J., Chumpitaz, R. & Schuiling, I. (2007). *Market – Driven Management* (2nd ed.). London, UK: Palgrave Macmillan.

Lincoln, K. & Thomassen, L. (2008). *Private label – Turning the retail brand threat into your biggest opportunity*. London, UK: Kogan Page Limited.

Liu, T.-C. & Wang, C.-Y. (2008). Factors affecting attitudes toward private labels and promoted brands. *Journal of Marketing Management*, 24 (3/4), 283-298.

Lymperopoulos, C., Chaniotakis, I. E. & Rigopoulou, I. D. (2010). Acceptance of detergent-retail brands: the role of consumer confidence and trust. *Industrial Journal of Retail & Distribution Management*, 38 (9), 719-736.

Mandhachitara, R., Shannon, R. M. & Hadjicharalambous, C. (2007), Why Private Label Grocery Brands Have Not Succeeded in Asia. *Journal of Global Marketing*, 20 (2/3), 71-87.

McDaniel, C. & Gates, R. (2008). *Marketing Research Essentials* (6th ed.). Hoboken, NJ: John Wiley & Sons.

Miguel, S., Caplliure, E. M. & Aldas-Manzano, J. (2002). The effect of personal involvement on the decision to buy store brands. *Journal of Product & Brand Management*, 11 (1), 6-18.

Mitchell, V-W. (1998). A role for consumer risk perceptions in grocery retailing. *British Food Journal*, 100 (4), 171-183.

Mitchell, V-W. (1999). Consumer perceived risk: conceptualisations and models. *European Journal of Marketing*, 33 (1/2), 163-195.

Mohan, A. V. & Krishnaswamy, K. N. (2006). Marketing Programmes across different phases of the product life cycle: An explorative study in the Indian machine building sector. *Asia Pacific Journal of Marketing and Logistics*, 18 (4), 354-373.

Narasimhan, C. & Wilcox, R. T. (1998). Private Labels and the Channel Relationship: A Cross-Category Analysis. *Journal of Business*, 71 (4), 573-600.

Palmer, M. (2005). Crossing Threshold Periods in the Retail Life Cycle: Insights from Wal-Mart International. *European Management Journal*, 23 (6), 717- 729.

Prendergast, G.P. & Marr, N.E. (1997). Generic products: who buys them and how they perform relative to each other?. *European Journal of Marketing*, 31 (2), 94-109.

Richardson, P. S., Dick, A. S. & Jain, A.K. (1994). Extrinsic and intrinsic cue effects on perceptions of store brand quality. *Journal of Marketing*, 58 (4), 28-36.

Richardson, P. S., Jain, A. K. & Dick, A. (1996). Household store brand proneness: a framework. *Journal of Retailing*, 72 (2), 159-185.

Ross, I. (1975). Perceived Risk and a Consumer Bahavior: a Critical Review. *Advances in Consumer Research, Association for Consumer Research*, 2, 1-20.

Sethuraman, R. (2003). Measuring National Brands' Equity over Store Brands. *Review of Marketing Science,* 1, Article 2.

Sheinin, D. A. & Wagner, J. (2003). Pricing store brands across categories and retailers. *Journal of Product & Brand Management,* 12 (4), 201-219.

Simon, H. (1979). Dynamics of Price Elasticity and Brand Life Cycles: An Empirical Study. *Journal of Marketing Research,* 16 (4), 439-452.

Sinha, I. & Batra, R. (1999). The effect of consumer price consciousness on private label purchase. *International Journal of Research in Marketing,* 16, 237-251.

Steenkamp, J.-B., E. M., Van Heerde, H. J. & Geyskens, I. (2010). What Makes Consumers Willing to Pay a Price Premium for National Brands over Private Labels?. *Journal of Marketing Research,* 47, 1011-1024.

Thietart, R. A. & Vivas, R. (1984). An Empirical Investigation of Success Strategies for Business along the Product Life Cycle. *Management Science,* 30 (12), 1405-1423.

Veloutsou, C., Gioulistanis, E. & Moutinho, L. (2004). Own label choice criteria and perceived characteristics in Greece and Scotland: factors influencing the willingness to buy. *Journal of Product & Brand Management,* 13 (4), 228-241.

Vranešević, T. (2007). *Upravljanje markama,* Zagreb: Accent.

Vranešević, T., Vignali, C. & Vrontis, D. (2004). *Upravljanje strateškim menadžmentom.* Zagreb: Accent.

Wileman, A. & Jary, M. (1997). *Retail Power Plays: From Trading to Brand Leadership.* London, UK: Macmillan Press.

Wong, H.-K. & Ellis, P. D. (2007). Is market orientation affected by the product life cycle?. *Journal of World Business,* 42, 145-156.

Wood, L. (1990). The End of the Product Life Cyacle? Education Says Goodbye to an Old Friend. *Journal of Marketing Management,* 6 (2), 145-155.

Zielke, S., Dobbelstein, T. (2007). Customers willingness to purchase new store brands. *Journal of Product & Brand Management,* 16 (2), 112-121.

THE QUESTION OF INSTABILITY, UNCOMPETITIVENESS AND GROWTH SLOWDOWN OF SMALL MIDDLE-INCOME COUNTRIES IN THE EURO AREA

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ABSTRACT: *The thesis of this article is that a small country with a below-average per capita income is in a disadvantaged macroeconomic position inside the euro area. Small middle-income countries expected an acceleration of growth by joining the EMU. They were hoping to catch up in the convergence process within the euro area. Yet things turned out differently. The crisis in 2009–2012 has led to excessive instability due to exogenous macroeconomic prices and the lack of a lender of last resort for sovereign debtors. Small MICs are more vulnerable to asymmetric shocks from abroad due to the 'one-size-fits-all' economic policy at the EMU level. This is reflected in the excessive volatility of real economic variables (such as GDP and unemployment), and excessive financial instability (such as indebtedness) and sovereign debt. The crisis also revealed weak price competitiveness of exports due to overvalued exchange rate of the euro and overall under-average productivity of the MICs. MICs had to respond with deflationary internal (surrogate) devaluations and depressed aggregate demand. Measures of internal surrogate devaluations may partially improve situation in the medium term, yet they may worsen the competitive growth situation in the long run. A macroeconomic environment of macroeconomic instability and weak competitiveness may trigger a slowdown in growth.*

1. INTRODUCTION

I have pursued the question of the macro-economic situation facing small middle-income countries in the euro area (EA) in a series of articles (Senjur, 2007, 2010, 2012). In my previous article, I was afraid that the "competitive growth of small middle-income countries in the eurozone is far from being assured". Competitive growth is defined as above-average growth in output that helps MICs catch up with developed countries. My thesis was that such growth would be difficult to achieve but perhaps still possible to a

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certain level. In the present article, which is a follow-up to the previous article, my thesis is that small MICs inside the euro area might face a slowdown in growth instead of accelerated growth.

A small country inside the euro area with a below-average per capita income has the disadvantage of instability. It is more vulnerable to asymmetric shocks from abroad due to the 'one-size-fits-all' economic policy at the EMU level. This is reflected in the excessive volatility of real economic variables (e.g., GDP and unemployment) due to wrong macroeconomic prices (interest rate, exchange rate, level of prices). There is excessive financial instability (e.g. indebtedness) and sovereign debt without any institutional lender of the last resort for the sovereigns.

Small middle-income countries face weak price competitiveness inside the euro area, which is reflected in the weak external and internal competitiveness of exports. The reason is overvalued exchange rate of the euro and overall lower productivity due to under-overage level of development. Measures of internal (surrogate) devaluations, such as relative deflation, wage reductions and tax reductions, may partially improve the situation in the medium term, yet they may worsen the competitive growth situation in the long run.

Taking all together, instability and un-competitiveness, there is a real possibility that, instead of catching-up, the competitive growth may turn into growth slowdown. The crisis of the euro and the prolonged recession, which has devastated countries on the periphery, has led to a change in perspective. What was previously a hunch is now more certain. This situation calls for an explanation and for new research theses about the causes and prospects of the growth of small MICs in the euro area (Blanchard, 2007; Landmann, 2011; Estrada, Gali and Lopez-Salido, 2012).

The article elaborates the question of the macroeconomic instability und un-competitiveness of small MICs in the euro area. In order to present empirical illustrations I apply grouping of the 17 countries of the euro area into two groups. The first group in the euro area, the high-income countries, comprises countries with a per capita income higher than the average for the euro area. This article provides illustrative data for the average of euro area countries (EA-17) and for Germany as the selected high-income country.

The second group, the middle-income countries, includes countries with a per capita income below the average for the euro area.[2] It has become a habit to call the first group "core countries" and the second group "periphery countries". Inside the second group, the middle-income countries or periphery countries, there is a sub-group of small below-average-income countries: Greece, Portugal, Slovenia, Estonia and Slovakia. I am interested in such countries because they do not affect the average of the euro area, but are fully affected by the average categories of the euro area (such as exchange rates, interest rates, price levels,

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[2] The countries of the euro area are grouped into just two groups. In the case of the entire EU it would be useful to define three groups: high-income countries, middle-income countries (below the average and above the 75% threshold), and low-income countries (below the 75% threshold of the EU-27 average).

and unit labour costs). The article presents illustrative data for a group of three euro-countries that could be described as small below-average-income countries on a similar level of development (EA-3). This group comprises Greece, Portugal and Slovenia. Estonia and Slovakia were not included in this group because they joined the EMU later.

It is of some interest how those countries, which still have their own currency, and have below average income per capita, were affected by the recession. Czech Republic, Hungary and Poland reacted with adjustments to their nominal exchange rates. I will show data for these three countries (EU-3), as non-euro EU member countries, to compare with EA-3 countries using the euro.

Table 1: *Index of GDP per capita in PPS (EU-27 = 100), 1999–2012*

	1999–2003	2004–08	2010–12
EU	100	100	100
EA-17	112	109	109
Germany	117	115	122
EA-3			
Greece	87	92	81
Portugal	80	78	77
Slovenia	81	88	84
EU-3			
Czech R.	73	80	81
Hungary	58	63	67
Poland	48	53	65

Source: Eurostat-Tables; period's yearly averages.

It is to be noted that the article does not give thorough empirical analysis. The sample of countries is small and time period is short. Selected empirical data in the form of tables are given as an empirical illustration to indicate the problems of concern. The tables are supposed to speak for themselves and are not commented at length in the text.

The article is structured to present introduction in the first section. The second section of this article discusses the growth queston of the MICs. The third section elaborates in detail the issue of asymmetric macroeconomic instability at the national level, which is reflected in the excessive volatility of small MICs. The fourth section deals with the issue of price competitiveness and internal surrogate devaluation. Section five raises the question of a possible slowdown in growth. The last chapter concludes the discussion.

2. GROWTH QUESTION

2.1. GROWTH ACCELERATION AND CONVERGENCE

This article is interested in growth questions facing small middle-income countries that are within the euro area framework. Such countries encounter the questions of catching

up and competitive growth as well as which policy to use in order to grow in absolute terms and to improve their relative competitive position in the euro area. Competitive growth would be reflected in a durable above-average growth rate of per capita income (i.e., positive growth differentials):

$$g^{MIC} > g^{ea} \qquad\qquad (2.1)$$

where g^{MIC} refers to the growth of middle-income countries, and g^{ea} is the average growth rate of the whole euro area.

A basic growth model is the neoclassical growth model of the Solow type (R. Solow). This basic growth model, which is a supply-side approach, has to be supplemented by endogenous growth (P. Romer), a demand-side Keynesian approach (R. Harrod and E. Domar), an entrepreneurial type of growth of the Schumpeterian type (J. Schumpeter), and a competitiveness approach (M. Porter). Such a comprehensive approach enables the study of the growth of MICs inside the euro area. The basic neoclassical growth model is simply insufficient to explain the growth problems of MICs in the euro area.

An interesting implication of the basic neoclassical growth model is the convergence thesis. The convergence thesis has evolved from absolute convergence (Barro and Sala-i-Martin, 1992; Lucas, 2000) through conditional convergence (Mankiw, Romer and Weil, 1992) to multiple pole convergence, e.g. twin peaks (Quah, 1996), and finally to the asymmetric world equilibrium (Acemoglu, Robinson and Verdier, 2012).

The absolute convergence thesis of neoclassical growth theory is that less-developed countries will eventually catch-up with developed countries (Lucas, 2000): the lower the initial comparative per capita income level, the higher the growth rate. According to this thesis, middle-income countries inside the euro area should eventually catch-up with the high-income countries. More recent research reveals that one may no longer assume growth convergence. Convergence is not automatic (Rodrik, 2011) and it has become quite a sophisticated issue. Even the thesis of divergence has been resurrected. Landmann (2011) points to the possibility of non-convergence or even divergence within the euro area.

Hausman, Pritchet and Rodrik (2005) found that growth accelerations tend to be related with increases in the investment rate and trade, and with an undervalued real exchange rate (Rodrik, 2008). Those authors define growth accelerations as instances of rapid acceleration in income growth that are sustained for at least 8 years. The authors also find a declining probability of a growth transition with rising income levels. This means that accelerated growth goes to a certain income distance and may get stuck in a middle-income trap (Eichengreen, Park and Shin, 2012; 2013).

Price competitiveness due to an undervalued real exchange rate should help bring about accelerated growth, which would bring the income of MICs to the new income plateau (Rodrik, 2008). This income plateau could be a new starting point for further develop-

ment or it could mean "the middle-income trap" for a slowdown in growth as talked about in the article by Eichengreen, Park and Shin (2013). They defined growth slowdowns as a reduction in the growth rate sustained over the medium term (of seven years). The probability of a slowdown peaks when per capita GDP is roughly three-quarters of that of the leading countries. MICs encounter "the middle-income trap".

2.2. The demand-led catching-up growth of small middle-income countries is under threat

I have constructed a model of growth based on aggregate demand (Senjur 2011). The advantage of this model is that it allows the inclusion of demand, exports, the real exchange rate, and prices in the analysis. I assume there are two groups of countries divided by per capita income (Senjur 2007).[3] The first group consists of high-income countries, which are growth leaders based on innovation. The potential output of high-income countries, Q^*, is determined by production factors, endogenous technological progress, and institutional settings. The second group consists of middle-income countries. They are growth followers, and their growth is efficiency-based and demand-driven. The potential output of middle-income countries, Q^{**}, is smaller than for high-income countries, $Q^{**} < Q^*$. The model (Senjur, 2012) maintains that the output is determined by the production function

$$Q = AF(K,L,H), \tag{2.2}$$

where A is a productivity parameter, K is capital, L is labour and H is human capital. The growth rate is positively related to the growth of productivity, capital, labour and human capital. On the other hand, the income is also determined by aggregate demand

$$Y = B \ F(D,X), \tag{2.3}$$

where B is autonomous demand, D are elements of domestic demand (consisting of private consumption C, public consumption G, and investment I) and X is exports representing foreign demand.

An important thesis is that aggregate demand is also a factor of the potential output of middle-income countries. High aggregate demand can stimulate and facilitate the transfer of resources from high-income countries and therefore helps to push the potential output of middle-income countries upwards. Aggregate demand is one of the growth factors of middle-income countries and is one of the driving forces of the catching-up growth effect. It is also assumed that some components of aggregate demand have a double effect: they affect aggregate demand (i.e., actual income) on one hand, and potential output (i.e., supply) on the other. Investment plays such a dual role. Exports also have such a double role: the spillover relies on the technological, learning, and marketing externalities of exports (Rodrik, 2008).

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[3] For simplicity, I disregard the existence of the third group (i.e., a low-income group).

On the demand side, we isolate exports as a driver of the total demand. Exports (X) are determined by foreign income, Q_f, and the real exchange rate (E), which determines the price competitiveness of exports. The export growth rate is positively determined by the growth rate of foreign output and negatively by growth of the real exchange rate.

From the definition of the real exchange rate ($E=eP/P^*$), it follows that

$$g_E = g_e + \pi - \pi^*$$ (2.4)

g_e is growth rate of nominal exchange rate e, π^* is the foreign inflation rate, and π is the domestic inflation rate.

After some simplifications and manipulation of the above expression, it is possible to describe the growth rate of output (g_Y) with the following expression:

$$g_Y = g_B - \lambda(g_e) - \lambda\,(\pi - \pi^*)\;.$$ (2.5)

In this expression, the growth rate depends on the growth rate of summary factors of productivity, capital and labour (g_B), the rate of change of the nominal exchange rate (g_e) and differential inflation ($\pi - \pi^*$). Appreciation (increase) of the real exchange rate lowers the price competitiveness of the economy and reduces the growth rate of output. With changes in the nominal exchange rate in accordance with differential inflation ($\pi - \pi^*$) it is possible to keep the real exchange rate stable. The price competitiveness of exports can thereby be kept stable and consequently the rate of output growth would not be exposed to negative movements in the inflation differential.

There is a dynamic interplay between output and demand (income). Demand is an outlet for output, yet it is also a driving force for output. Dynamics of growth originate on the production (output) side as well as on the demand side. The theory of growth based solely on production is crippled and insufficient. It cannot explain such an important growth experience as the East-Asian growth 'miracle', which is significantly based on export-driven growth. The thesis is also relevant to the growth of MICs inside the euro area. However, price competitiveness due to an undervalued national currency is not an option available to the MICs of the euro area. In this regard, their growth potential is handicapped and they have to look for surrogate measures such as, for example, an internal surrogate devaluation. The growth effectiveness of a surrogate devaluation lags behind an ordinary currency devaluation.

The growth characteristics of the new EU member countries prior to joining the EMU were extensive employment, high investment activity and strong export growth. Such growth was demand-driven. For MICs of the euro area the demand tends to be depressed and therefore these countries are deprived of a demand driver of growth.

3. EXCESSIVE MACROECONOMIC INSTABILITY AT THE NATIONAL LEVEL

A macroeconomic model for an individual member country in the euro area (EA) is not a closed system (Senjur, 2010). Monetary policy, the nominal interest rate, the benchmark inflation rate, and the exchange rate are determined outside a national economic system. This has important macroeconomic repercussions (Beetsma and Giuliodori, 2010; Feldstein, 2012). Movements of national monetary aggregates (like credit growth, saving, investment, public debt) are based on exogenous, and therefore 'wrong', prices, and therefore may be erratic and erroneous. Stability is not built into the model at the national level.

3.1. Volatility of the real economy and rigidity of macro-relevant prices

The euro architecture is such that nominal macroeconomic prices like interest rates, inflation rates and the exchange rate are determined at the euro level. The problem is that, as such, they may not be related to the different real economy situations at the national level. On the other hand, the Keynesian conditions of imperfect competition in national labour and product markets cause rigid wages and prices. All macro-relevant nominal prices are exogenous or rigid.

Equilibrium in terms of aggregate supply (AS) and aggregate demand (AD):

$$Y^{AS}[P(P^*,w)] = Y^{AD}(P,i;X). \tag{3.1}$$

P is the level of prices, P^* is the price level in the EA, w is the real wage, and i is the real interest rate. The price level on the supply side is determined by the price level at the EA (due to the law of one price in the European single market) and the national unit labour cost. Aggregate demand depends on the price level and the interest rate (i), according to given exports (X). Because the quantity of money and interest rate are determined exogenously from the point of view of a small national economy, the level of prices cannot function as an equilibrating instrument of AS and AD. Wages is the only available variable that may bring AS into equilibrium with AD, yet even wages tend to be rigid.

Due to the fact that nominal variables are stable (determined at the euro level) or rigid, adverse economic conditions will trigger greater fluctuations in employment and output because the economy cannot adapt by adjusting nominal variables. In this situation, it may happen that the fluctuation of real variables (output and unemployment) at the national level may be great. The instability of variables of the real economy may be a problem in a system of a *one-size-fits-all* monetary policy.

It would be of interest to compare the performances of countries with different macroeconomic conditions during the recession. One could compare three groups of EU member countries: euro member countries with a high income (HICs), small euro countries with a middle income, and middle-income countries with their own national currency.

Table 2: *Differrential growth rates of Gross domestic output, volume (percentage change on preceding year, 2004–2012)*

	2004–08	2009	2010–12
EA-17 (g*)	2.1	-4.5	0.9
Differential growth: g-g*			
Germany	-0.1	-0.6	+1.8
EA-3			
Greece	+1.0	+1.4	-7.0
Portugal	-0.9	+1.6	-1.8
Slovenia	+2.8	-3.4	-1.1
EU-3			
Czech R.	+3.4	0.0	+0.2
Hungary	+0.6	-2.3	+0.6
Poland	+3.3	+6-1	+3.5

Source: European Commission, European Economic Forecast, Autumn 2013, European Economy, No. 7/2013. Note: g*is benchmark growth rate, e.g. growth rate of the GDP of EA-17, g is growth rate of an individual country, g-g* is differential growth rate as a difference between country growth rate and benchmark growth rate. Yearly averages are calculated over the period.

Data in Table 2 indicate that there are asymmetric effects of recession on different groups of the EU member countries. The recession of 2009–2012 hit the EA-3 economies more than the average in the euro area. This may be an indication of the excessive fluctuation of real economic variables in MICs. The data also indicate that the EU-3 member countries with their own national currencies seem to have better survived the recession. It is possible to assert that the EA-3 euro countries were more exposed to fluctuations of real economic variables during the recession as HICs of euro area and as non-euro MICs of EU. This is one of the most important thesis raised by recent economic events in the last decade.

3.2. Financial instability: Saving investment gap

In a simple macroeconomic model, the national macroeconomic equilibrium is determined by an equality of investment (I) and savings (S):

$$I(i, Y^e) = S(Y, i) \qquad (3.2)$$

Y^e is the expected income. The instrument of equilibrating macroeconomic categories I and S is the interest rate, i. Because the interest rate is determined at the level of the euro area, such an interest rate does not equilibrate investment and saving at the national level of MICs. Disequilibrium at the national level of EMU member states is a consequence (see Table 3).

Table 3: *Total investment and export of goods and services, volume (percentage change on preceding year, 2004–2012)*

	Investment			Export		
	2004–08	**2009**	**2010–12**	**2004-08**	**2009**	**2010-12**
EA-17	2.9	-12.8	-1.0	5.9	-12.4	6.8
Germany	2.9	-11.7	3.5	8.4	-13.0	8.1
Greece	2.6	-13.7	-17.9	6.4	-19.4	1.0
Portugal	0.1	-8.6	-9.3	4.6	-10.9	6.8
Slovenia	7.7	-23.8	-9.7	10.6	-16.1	5.9
Czech R.	6.4	-11.0	-1.0	10.8	-10.9	9.7
Hungary	3.1	-11.1	-6.0	13.1	-10.2	7.1
Poland	10.9	-1-2	2.1	10.5	-6.8	7.9

Source: European Commission, European Economic Forecast, Autumn 2013, European Economy, No. 7/2013. Yearly averages over the period.

The common monetary policy is a policy of a low interest rate for a catching-up country. After adopting the euro, a catching-up country faced a low interest rate monetary policy. A lending-based expansion (2004-2008) based on overly bullish expectations about future income eventually became unsustainable during a recession (2008-2012). Investment crushed. A credit boom turned into a credit crunch.

3.3. External disequilibrium: Foreign indebtedness

The saving investment gap may lead to a foreign exchange gap (X – M) reflected in a current account deficit of the balance of payments. External stability is determined by the balance-of-payments equation:

$$BP = NX(Y,Y^*,E) + CF(i - i^*). \tag{3.3}$$

BP is the balance of payments, while *NX=X-M* is net exports which depend on domestic income (Y), foreign income (Y^*), and the real exchange rate (E). The real exchange rate determines the price competitiveness of exports: $E = (eP/P^*)$, e is the nominal exchange rate, E is the real exchange rate, P is the national price level, and P^* is the foreign price level. *CF* is the capital flow which is determined by the difference between the domestic and foreign interest rate. Interest rate differential $i - i^*$ is determined exogenously and therefore *CF* is exogenously given. There is full mobility of capital inside the EMU. The flows of loans are demand-driven. They respond to needs to finance the trade deficits of individual EMU member countries.

For small MICs the prevailing exchange rate and interest rate in the euro area are improper for national conditions. The nominal exchange rate is overvalued, which tends to cause a deficit in current accounts (Table 4). The equilibrium interest rate is too low, which leads to indebtedness. The combination of an overvalued exchange rate and a low interest rate is deadly.

Table 4: *Current account balance (% of GDP, 2004–2012)*

	2004–08	2009–12
EA-17	0.3	0.5
Germany	6.0	6.5
EA-3		
Greece	-14.1	-11.1
Portugal	-10.4	-7.6
Slovenia	-3.5	0.7
EU-3		
Czech R.	-3.4	-3.6
Hungary	-7.9	0.5
Poland	-4.0	-3.8

Source: European Commission, European Economic Forecast, Autumn 2013, European Economy, No. 7/2013. Yearly averages over the period.

A deficit in the current account is financed by debt due to a low interest rate and the full mobility of capital. In a time of expansion (2004–2008) capital flows from core to periphery countries. The business economy tends to be highly leveraged, facilitated by domestic banks that could obtain cheap funds in euro financial markets. The excessive foreign indebtedness of firms and banks may be a consequence. The growth of credits reflected the demand for loans with a virtually unlimited supply of loans. This had expansionary macro-economic effects.[4] The recession of 2009–2012 has changed the direction of capital flows; they are running out of periphery countries.

3.4. Sovereign debt crisis

There were tendencies towards great commercial indebtedness and public debt, which is intermediated by the banks. For a country inside the euro area, the problems of private business indebtedness may transform through a banking crisis into a budget deficit and public debt. A sovereign debt issue may arise (Table 5). Some governments of periphery countries tended to increase public debt, which in the initial stages is also cheap (e.g. Greece). They financed public debt through domestic banks, which again received funds through European euro markets. There is therefore a combination of high indebtedness of the business economy and high sovereign debt. Some other countries were pushed into an excessive budget deficit by a sudden and exogenously caused recession (e.g. Slovenia).

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[4] Data on Slovenia show a rapid increase in gross foreign debt since the country joined the EU and especially since joining the EMU. It should be noted that private debt has contributed the most to the total foreign debt.

Table 5: *Net lending (+) or net borrowing (-), and gross debt, general government (as % of GDP, 2004–2012)*

	Net lending		Gross debt	
	2004–08	2009–12	2004-08	2010-12
EA-17	-1.9	-5.1	69	89
Germany	-1.7	-2.0	67	81
EA-3				
Greece	-7.0	-11.2	108	158
Portugal	-4.4	-7.7	68	109
Slovenia	-1.4	-5.6	25	47
EU-3				
Czech R.	-2.3	-4.5	28	42
Hungary	-6.5	-1.7	65	81
Poland	-3.7	-6.1	47	56

Source: European Commission, European Economic Forecast, Autumn 2013, European Economy, No. 7/2013. Yearly averages over the period.

The 2009–2012 recession highlighted the problem of business and bank indebtedness on one hand and sovereign debt on the other hand in some countries in the EMU. There is one additional point to be made. The recession exposed the role of the state as an owner/lender of last resort. In the final instance, the state becomes responsible for the debts of the banks.

3.5. An aggravated and protracted recession

During the recession the banks were confronted with an enormous amount of non-performing loans. They needed restructuring or to be faced with bankruptcy. Since as financial infrastructure banks are too important to fail (too big to fail), the state has provided public resources to rescue them. The euro area periphery countries had to borrow by themselves. Because they were unable to borrow inside the EMU, they were forced to turn to capital markets (Higgins and Klitgaard, 2012). Capital markets sensed the weakness of these sovereign borrowers and charged them high country risk premiums. In this way the sovereign debt of the euro area periphery countries became an issue.

Table 6: *EMU convergence criterion – annual data*

	2002	2007	2009	2011	2012
EA-17	4.91	4.32	3.82	4.41	3.88
Germany	4.78	4.22	3.22	2.61	1.50
EA-3					
Greece	5.12	4.50	5.17	15.75	22.50
Portugal	5.01	4.42	4.21	10.24	10.55
Slovenia	8.72	4.53	4.38	4.97	5.81
EU-3					
Czech R.	4.88	4.30	4.84	3.71	2.78
Hungary	7.09	6.74	9.12	7.64	7.89
Poland	7.36	5.48	6.12	5.96	5.00

Source: Eurostat-Tables. Short description: long-term interest rates (central government bond yields in secondary markets, with around 10 years of residual).

The recession introduced something new to the uniform interest rate. Commercial risks and sovereign debt risks caused significant country-specific risk premiums on the interest rate. Despite one formal nominal benchmark interest rate that is determined by the ECB, the individual countries have had to face interest rate differentials ($i - i^{ea}$) due to the national risk premiums. As a result, a country encounters a country-specific interest rate. Inside the EMU interest rates vary by countries. Periphery countries face a high interest rate and the core countries a low one (Table 6). This situation aggravates the recession in the periphery countries.

The flow of capital changes direction. Prior to the recession, it moved from the core to the periphery, while during the recession it flowed from periphery to core countries. One may hypothesise that prior to the recession (up to 2008) and during the recession, the EMU macroeconomic conditions worked pro-cyclically or in a pro-recessionary way in the periphery countries. The recession is therefore excessive on one side and protracted on the other. Capital flows were pro-cyclical and aggravated the cyclicality of the economies in question. The macroeconomic system of the euro is not comprehensive and is unstable. It needs exogenous administrative regulation in order to complete and correct it. However, here we are not interested in what should be done on the euro level to correct the deficiencies of the euro system's architecture (De Grauw, 2011; Schambaugh, 2012).

4. PRICE COMPETITIVENESS AND INTERNAL DEVALULATION

Competitiveness has many aspects (Porter, 1990). There is location competitiveness, product competitiveness and price competitiveness, among others. I shall limit my discussion to price competitiveness. For the euro member countries, a discussion on price competitiveness may be divided into external (with non-euro countries) and internal (within euro area) price competitiveness.

4.1. External price competitiveness

The external price competitiveness is determined by the nominal exchange rate (e) and comparative price level (P/P*). The real exchange rate expressed as $E = (e)(P/P^*)$ may be named the external real exchange rate (*RER*). An increase in RER means an external real appreciation and reduces the price competitiveness of exports. National goods are more expensive in terms of foreign currency. Depreciation increases price competitiveness. External price competitiveness could be increased by reducing the nominal exchange rate or by decreasing the level of domestic prices relative to foreign prices.

The nominal exchange rate of the euro, *e*, is determined for the entire euro area and should reflect the balance of payments position for the entire euro area. Due to differences in national GDP per capita and productivity, the common exchange rate puts different countries in varying external competitive positions. Such an average exchange rate of the euro would boost the export competitiveness of some countries (e.g., high-income core countries), and erode the export competitiveness of some others (e.g., below-average-income periphery countries). The exchange rate of the euro is overvalued from the point of view of small middle-income countries.

Table 7 : *Real effective exchange rate, index (2005 = 100)*

	1999–03	2004–08	2009–11
EU-27	84	104	100
Germany	101	98	96
EA-3			
Greece	92	99	101
Portugal	92	99	97
Slovenia	98	101	109
EU-3			
Czech R.	82	106	118
Hungary	81	101	94
Poland	107	103	100

Source: Eurostat - Tables. Note: The real effective exchange rate (REER) aims to assess a country's price or cost competitiveness relative to its principal competitors in international markets (a panel of 36 countries: EU-27 + 9 other industrialised countries). The specific REER is deflated by nominal unit labour costs. A rise in the index means a loss of competitiveness. The nominal exchange rate is the national exchange rate against the euro. Note: yearly averages over the periods.

The effective real exchange rate of small MICs (EA-3) grows faster than the average of the EU and of Germany as a benchmark country (Table 7). These countries are losing their initial competitiveness.[5] Three EU countries (EU-3) used the exchange rate as a policy instrument during the recession. At the start of the recession in 2009 they devalued their national currencies against the euro by around 11 percent on average (Table 8).

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[5] Up to 2006, Slovenia kept its REER virtually unchanged with an active policy of nominal national currency devaluations. After joining the euro in 2007, the Slovenian REER appreciated by nine percentage points in just four years.

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Table 8. *Exchange rate against the euro (1 EUR = ... units of national currency), selected EU countries (index 2008=100)*

	2008	2009	2010	2011
Czech koruna (CZ)	100	106	103	98
Hungarian forint (HU)	100	111	110	111
Polish zloty (PL)	100	123	114	117
US dollar (USA)	100	95	90	95

Source: Eurostat

In external international trade, small middle-income countries would need to take compensatory measures to restore their export competitiveness, which is reduced due to the overvalued exchange rate of the euro. The lower comparative price levels (P/P*) prevent these countries from being uncompetitive despite a high nominal exchange rate. Lower comparative price levels (CPLs) reduce the real exchange rate, which increases the external competitiveness of these countries. In the time of the recession (2009–2012), the EU-3 non-euro-countries outperformed the EA-3 euro-countries in terms of export growth (Table 3).

4.2. Internal price competitiveness

For trade inside the euro area, one may refer to the internal *RER* where the nominal exchange rate (e) is fixed or equal to one. The internal real exchange rate depends on comparative price levels (CPLs), which are related to the national price level with the euro area average price level: $CPL = P/P^{ea}$. One may call a change in the internal RER an internal depreciation and/or appreciation, which is due to an inflation differential ($\pi - \pi^{ea}$). If domestic inflation is higher than the average in the euro area, there will be internal appreciation; that is, lower export competitiveness inside the euro area. One may refer here to internal price competitiveness.

In trade among countries inside the same currency area (e.g. the EMU) the competitiveness of products which are being exported is determined by absolute cost. The MICs tend to face an absolute disadvantage in trade among countries inside the euro area due to their lower productivity. The disadvantage of lower productivity could be compensated by a lower comparative level of prices. In internal international trade (inside the EA), lower comparative price levels are a dominant factor of the internal competitiveness of small MICs by the given lower comparative productivity of these countries in comparison to high-income countries.[6]

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[6] For illustration purposes I present the case of Slovenia. The Slovenian data (period 2010-12) show that the figures for the total current account are not bad. It could be claimed that the overall exchange rate of the euro was not so bad for Slovenian foreign trade when taking the lower comparative price level in Slovenia into account. Slovenia has a huge current account (CA) surplus in trade with non-EMU countries. However, the current account of internal trade inside the euro area was much worse. There is a CA deficit in trade with EMU countries. As far as the total current account is concerned, there may have been some kind of trade-off between external and internal competitiveness. External competitiveness has compensated for some of

4.3. Decreasing price competitiveness due to the convergence of comparative price levels

The middle-income countries joined the euro area with lower comparative price levels. They enjoyed an initial price competitive advantage in the euro-area markets due to the lower comparative price levels (Table 9). This enabled their faster growth of exports and therefore their faster rate of output growth. The initial price level and cost conditions enabled the middle-income countries to catch up as long as such competitive conditions prevailed.

Table 9: *Comparative price levels (of final consumption, EU-27=100, period 1999-2012)*

	1999–03	2004–08	2010–12
EA-17	101	102	104
Germany	107	103	101
EA-3			
Greece	84	89	91
Portugal	84	86	85
Slovenia	74	78	84
EU-3			
Czech R.	51	63	69
Hungary	53	64	56
Poland	58	62	55

Source: Eurostat-Tables. Note: yearly averages over the periods.

There are two factors of the internal price competitiveness of exports inside the eurozone: the initial comparative price level (CPL= P/P^{ea}), and inflation differentials ($\pi - \pi^{ea}$), which cause an internal appreciation or depreciation. A change in CPL is determined by inflation differentials: $g_{CPL} = \pi - \pi^{ea}$. If domestic inflation (π) is higher than the average inflation in the eurozone (π^{ea}) the comparative price level will grow. This reflects internal appreciation and a reduction of the price competitiveness of exports (Tables 9 and 10).

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the deficiency of internal competitiveness. After adopting the euro Slovenia did not have an exchange rate shelter for its lower productivity and higher cost in the internal (euro area) market. Without an exchange rate shelter, after joining the EMU it was not competitive in trade with EMU countries, although the lower initial comparative price level gave Slovenia a certain competitive edge (see Table 9). Slovenia's problem up till this point is its internal competitiveness.

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Table 10: *Differential inflation rate based on Harmonised index of consumer prices (% change on previous year, 2004–2012)*

	2004–08	2009–12
EA-17, π*	2.4	1.8
Differential inflation, π- π*		
Germany	-0.3	-0.3
EA-3		
Greece	1.0	0.7
Portugal	0.2	-0.1
Slovenia	1.2	0.2
EU-3		
Czech R.	0.7	0.1
Hungary	3.2	2.8
Poland	0.4	1.8

Source: European Commission, European Economic Forecast, Autumn 2013, European Economy, No. 7/2013. Note: yearly averages over the periods.

The single market induces higher inflation for countries with a lower CPL due to the law of one price and due to the Balassa effect.

The first effect is the impact of the law of one price that works inside the euro area. Although there are inherent and non-inherent market imperfections of the single market, one can maintain that there is a convergence of national price levels due to the operation of the law of one price (LOP) (Senjur, 2010). The second effect is the so-called Balassa effect. As small MICs catch up in income level, their price levels are also gradually catching up due to the Balassa effect (Balassa, 1964).[7] The inflation rate therefore depends on the comparative price level gap $[\pi = a - \beta \, (P^i_0/P^{ea}_0)]$ and income gap $[P^i/P^{ea} = b(y^i/y^{ea})]$. The lower the initial national price level and the lower the initial income level in comparison to the average, the higher the growth rate of prices. This means that there is a convergence of national price levels (Table 9). Empirical results (Senjur, 2010) have shown that there is a statistically strong and highly significant convergence of comparative price levels of the new EU member states with the average of the EU-27: The lower the initial CPL, the larger the increase in the CPL. [8]

The single market within the euro area melts the abovementioned price advantages of middle-income countries away. The MICs will eventually lose the advantage of their lower CPLs.

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[7] Higher relative growth of prices of non-tradables due to differential growth of productivity in the tradable and non-tradable sectors.

[8] Strong convergence in price levels in the eurozone is also reported by Estrada, Gali and Lopez-Salido (2012).

4.4. Internal (surrogate) devaluation

The productivity of MICs inside the EMU is below average because these countries are unde-average developed (Table 1). Due to this fact of under-average development their cost of production are over-average. The MICs are un-competitive, as far as productivity is concerned. They may compensate theirs un-competitiveness due to lower average productivity by lower comparative level of prices (Table 9). This enables them certain price competitiveness on the markets of the EMU. However, due to European single market, and Balassa effect, there is a tendency toward convergence of comparative price levels. The initial price competitiveness of the MICs is therefore melting away.

To counteract the tendency of relative price-level increases national governments may pursue policies of price deflation and competitive disinflation. Some of these policies are polices of so-called 'internal devaluation'. Two main factors keep prices low in order to sustain the price competitiveness of export growth: the lowering of unit labour costs, and fiscal devaluation. We could describe these measures as internal surrogate devaluations.[9]

4.4.1. Unit labour costs

1) Competitive wage devaluation to reduce comparative ULC. A middle-income country initially has lower wages in comparison to its productivity, meaning it has an initial labour cost advantage. However, the operation of the single market in the EMU tends to undermine this initial cost advantage. Ramskogler (2012) investigated wage and unit labour cost developments in EMU member states in recent decades (1992–2005) for two groups of countries: core and periphery. He found for most countries of the periphery the interdependence and convergence of the nominal wage. At the same time, he found a divergence of nominal unit labour costs (NULC).[10] His conclusion was that competitiveness within the EMU diverged substantially. A similar conclusion can be derived from the article by Estrada, Gali and Lopez-Salido (2012) which finds that productivity has not converged appreciably across euro area countries, and that there is some evidence of convergence in nominal wages.

The economic policy of the MICs may counteract such tendencies with a deliberate policy of maintaining sustainable price competitiveness by keeping wages low in order to keep unit labour costs low. This would hopefully enable faster exports and output growth.

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[9] Such measures are actually surrogate devaluations because they try to compensate for the effects of the lacking currency devaluation.

[10] Unit labour cost data show how the remuneration of employees is related to the productivity of their labour. Eurostat gives following definitions. Nominal unit labour costs (NULC): (compensation of employees at current prices / no. of employees) / (GDP in volume / no. of persons employed). Real unit labour cost (RULC): (compensation of employees at current prices / no. of employees) / (GDP at current prices / no. of persons employed).

Wage devaluation. Assume that prices are determined by mark-up $(1 + m = A)$ and unit labour cost (w/q), where w is the real wage rate per worker and q is the productivity or output per worker $[P = A^\alpha (w/g)^\beta]$. Domestic inflation is determined by the growth of other factors (g_A) and the difference between the growth of wages and productivity per worker or growth of unit labour costs (g_{UCL}):

$$\pi = \alpha \, g_A + \beta(g_w - g_q) \tag{4.1}$$

By assuming that the mark-up and other costs are constant $(g_A = 0)$, the inflation rate π depends on growth of the unit labour cost $(g_w - g_q)$.

Table 11: *Labour productivity[1], real compensation per employees per head and real unit labour costs (% change on preceding year, 2004–2012)*

	Labour productivity		Real wages per worker		Unit labour cost	
	2004–08	2010–12	2004–08	2010–12	2004–08	2010–12
EA-17	1.0	1.4	0.3	0.1	-0.4	-0.4
Germany	1.2	1.7	-0.5	0.8	-1.3	-0.2
EA-3						
Greece	1.1	-0.6	0.1	-6.0	-0.8	-3.2
Portugal	1.1	1.6	0.4	-1.9	-0.4	-2.0
Slovenia	3.4	1.4	3.0	-0.1	-0.1	0.0
EU-3						
Czech R.	3.9	1.3	2.9	1.6	-0.2	1.6
Hungary	3.1	-0.1	2.1	-3.0	-0.5	-1.3
Poland	2.4	2.9	1.2	0.8	-1.6	-0.7

Source: European Commission, European Economic Forecast, Autumn 2013, European Economy, No. 7/2013. Note: 1) labour productivity: real GDP per occupied person). Yearly averages over the periods.

Since it is necessary to compare inflation rates in the euro area, one must compare unit labour costs (ULCs) in the euro area. Differential inflation $(\pi - \pi^{ea})$ may be expressed as a function of comparative unit labour costs (CULC = ULC^i /ULC^{ea}). If the unit labour cost of middle-income countries grows faster than the average for the euro area, inflation will surpass the average and a country will lose in the price competitiveness of its exports to the euro area (Tables 10 and 11). Blanchard (2007) reports on such problems in the case of Portugal.

2) Higher rate of unemployment. One way to keep inflation (and wages) down is through higher unemployment. One could point to the concept of the NAIRU (non-accelerating inflation rate of unemployment) or the natural rate of unemployment. However, for our analysis a relevant concept of natural unemployment may not be NAIRU but the non-differential inflation rate of unemployment (NDIRU); that is, an unemployment rate that keeps the national inflation rate at the level of the average euro area inflation rate (Senjur, 2010).

$$\pi - \pi^{ea} = B_2 - b_2 \, (u - u^{**}) \tag{4.2}$$

where u is the unemployment rate, u^{**} is the NDIRU, and b_2 is a parameter. Keeping the national inflation rate below the average of the euro area may require quite a high unemployment rate.

Table 12: *Unemployment rate and differential unemployment rate (%), 2004–2012*

	Unemployment rate (u)		Differential unemployment rate (u-u*)	
	2004–08	2010–12	2004–08	2010–12
EA-17 (u*)	8.4	10.5	0.0	0.0
Germany	9.7	6.2	1.3	-4.3
EA-3				
Greece	9.1	18.2	0.7	7.7
Portugal	8.4	13.6	0.0	3.1
Slovenia	5.6	8.1	-2.8	-2.4
EU-3				
Czech R.	6.6	7.0	-1.6	-3.5
Hungary	7.2	11.0	-1.2	0.5
Poland	13.5	9.8	5.1	-0.7

Source: European Commission, European Economic Forecast, Autumn 2013, European Economy, No. 7/2013. Note: yearly averages over the periods.

The other reason for higher unemployment is due to the need to reduce employment to increase productivity. A consequence of such a measure is higher unemployment and the greater inactivity of the population.

Table 12 indicates there may be some truth in the contention that small middle-income countries need a higher unemployment rate in order to maintain the competitiveness of their economies. One could point to the sacrifice ratio, that is the amount of excess unemployment to achieve disinflation in order to maintain internal competitiveness. Higher unemployment may be the cost of sustaining the price competitiveness of exports. Estrada, Gali and Lopez-Salido (2012) report that "the first nine years of EMU were associated with strong convergence in unemployment rate across euro area countries. That process was interrupted and largely reversed by the financial crisis".

4.4.2. Competitive fiscal devaluation

Jay S. Shambaugh (2012) differentiates between internal devaluation (lowering relative prices and wages) and fiscal devaluation. Fiscal devaluation has two components. One concerns unit public costs, represented by the relation between public expenditures and output. The other concerns such a structure of taxes that improves/reduces the relative prices of exports in comparison to imports (effective terms of trade).

A change in relative prices can be achieved through taxes. Government can reduce taxes on labour and at the same time increase taxes on consumption (Shambaugh, 2012; Farhi, Gopinath and Itskhoki, 2011; De Mooij and Keen, 2012). Consider a balanced budget shift

from payroll taxes to VAT (Blanchard 2007). Exporting firms pay less in payroll taxes, and are subject to the foreign, unchanged VAT rate. Firms selling to the domestic market will pay less in payroll taxes, but pay more in VAT. Such a shift will therefore achieve higher competitiveness: while the exporting firm will benefit, the importing firms will lose out. Empirical evidence suggests that in the eurozone countries may improve their trade balance in the short run, although the effects eventually disappear (De Mooij and Keen, 2012). However, such measures are a form of tax competition, and other countries may respond in a similar manner.

One would assume that a lower tax burden and a lower comparative unit public cost[11] would enable a lower input cost for tradables and therefore enhance the price competitiveness of exports (Table 13).

Table 13: *Total expenditure, general government (% of GDP, 2004–2012)*

	2004–08	2010–12
EA-17	46.9	50.1
Germany	45.4	45.9
EA-3		
Greece	46.5	52.3
Portugal	45.2	49.3
Slovenia	44.5	49.1
EU-3		
Czech R.	42.1	43.8
Hungary	50.3	49.5
Poland	43.1	43.7

Source: European Commission, European Economic Forecast, Autumn 2013, European Economy, No. 7/2013. Note: yearly averages over the periods.

Due to the lower level of prices of non-traded goods in an international comparison, the overall price level in a low-income country is lower. The original Balassa effect (Balassa, 1964) is based on comparatively cheap non-tradable goods in low-income countries. This fact is reflected in lower wages and eventually in higher international price competitiveness. There is a similar effect in middle-income countries.[12]

5. A GROWTH SLOWDOWN: THE CRUEL REALITY?

Small MICs in the euro area face the issues of excessive and asymmetrical macroeconomic instability along with weakening export competitiveness which require measures of price deflation and internal surrogate devaluations. How does all of this affect the growth potential and growth performance of these countries?

[11] General government expenditures divided by GDP.

[12] This argument could be turned around. If non-tradables are more efficient, this is reflected in higher productivity and reduces the input cost of production of tradables and therefore increases international competitiveness. Another source of competitiveness may be in the efficiency of non-tradables.

5.1. Depressed demand

It is possible to state the thesis (Senjur, 2012) that the growth of output depends on the growth of exports and that therefore the output growth differentials $(g_Y - g_Y^{ea})$ of a country are negatively related to the inflation differentials $(\pi - \pi^{ea})$:

$$(g_Y - g_Y^{ea}) = B - b(\pi - \pi^{ea}). \qquad (5.6)$$

A country with a below-average inflation rate would have above-average output growth, keeping other things unchanged. An above-average growth rate of output requires a below-average rate of inflation, *ceteris paribus*.

Due to the depressed demand a competitive growth of small euro-member MICs cannot be export- and demand-driven. Internal devaluation policies may have some negative effect on economic growth. Keeping inflation down requires depressed demand. Competitive growth cannot be demand-driven because policies of internal devaluations of wages and prices of non-tradable goods depress the internal demand. These are substantial growth disadvantages. The MICs inside the euro area may miss the phase of accelerated growth driven by demand, exports and an undervalued exchange rate. They are therefore in a disadvantageous position compared to other countries as far as this growth factor is concerned.

5.2. A distorted economic structure due to internal devaluation

Rodrik (2008 and 2012) shows there is a systematic association between a currency undervaluation and economic growth. This relation seems to work through the positive effect of an undervaluation on industrialisation which is driven by tradables. At the same time, it is known (Rodrik, 2008; Eichengreen, Park and Shin, 2013) that this result holds for developing countries, and that growth and undervaluation exhibit an inverse-U shape as per capita income grows. An undervalued real exchange rate provides less of an incentive to move up the technology ladder away from unskilled-labour-intensive sectors.[13]

Small MICs in the euro area do not have the option of a currency devaluation at their disposal. Instead, they may use measures of internal surrogate devaluations. On one side, in the medium term such policies may promote exports and therefore economic growth as well. On the other, such a policy may hinder the growth potential in the long run. Such policies may have negative side effects. The internal surrogate devaluation of wages and unit public cost implies pushing the economy to specialise in the economic structure of a low-wage and low-tax economy. This may mean that such an economy could become stuck in low-tech production, and that future productivity growth may be hampered.

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[13] It is interesting to note that some important determinants of growth accelerations (Huasmann, et al., 2005) eventually become determinants of growth slowdowns, e.g. a high investment rate and an undervalued real exchange rate. An investment rate that is too high may not be sustainable, and an undervalued exchange rate may hinder the transition to a higher stage of economic growth (Eichengreen et al., 2012).

5.3. Instability of real economic categories reduces the potential growth rate

Macroeconomic imbalances are short- and medium-term issues in economics. Yet they also have a long-run effect on potential output and economic growth. A credit crunch, fiscal austerity and the hysteresis effect of recession tend to slow growth down. Greater instability of real variables may damage the existence of firms and eventually undermine the production and growth capabilities of the country. Anti-recession policies on the national level of small MICs are required because recessions have a hysteresis effect through which shortfalls in output affect the economy's future potential output. Mitigating protracted output losses therefore raises potential future output (DeLong and Summers, 2012). Because the macroeconomic environment of the EMU for national economies of small MICs may not be a stable environment, national preventive institutions and measures should be foreseen in order to strengthen the resilience of a national economy against asymmetric shocks from abroad (Aiginger, 2009; Wren-Lewis, 2010).

5.4. Growth slowdown ?

The thesis of this article is that the convergence of middle-income countries may hold up to a certain distance toward the average of developed countries. After reaching this income plateau, the countries in question have to change their growth strategy to endogenous growth. If they succeed they may join the group of developed countries. It is up to the individual case (i.e., country) whether it would converge further, stay put, or diverge. On the other hand, demand- or export-driven growth is predominantly exogenous growth. All exogenous growth factors have diminishing returns and therefore face a diminishing catch-up effect. If small MICs want to make the transition from predominantly exogenous growth to predominantly endogenous growth, they may have problems with the extensive use of policies of imposed internal devaluations.

The assumption of the EU architecture is that the convergence thesis holds, even though there may be some imperfections in how it works in practice. To deal with such imperfections, the Cohesion Policy was established in order to compensate for any negative consequences of the single market on the growth of middle-income countries. At the national level, a national fiscal policy should be applied to facilitate national competitiveness and growth. Up until 2008 the wishful expectations about accelerated growth and convergence seemed to be justified. In 2007–2008 small MICs saw a peak in their growth performance (see Table 2). The economic crisis of 2009–2012 revealed the macroeconomic weaknesses of the EMU's institutional setting. Small MICs in the euro area are facing a slowdown in growth. Deflationary policies as well as policies of the internal devaluation of wages and fiscal devaluation tend to imply depressed demand. This tends to slow growth down.

The result may be a relative growth slowdown, instead of growth acceleration (Hausmann, Pritchett and Rodrik, 2005). Such countries may get caught in a middle-income

trap even before they have reached the upper middle-income plateau. This is a topic of the growth slowdown and middle-income trap that Eichengreen et al. (2013) refer to.

Feldstein (2011) claims that some of the countries which adopted the euro would have lower unemployment, a more competitive international position, and better prospects for the future if they had never been part of the European Monetary Union. Such a claim cannot be rejected outright. Some data presented in this article show that EU member countries which still have their own national currencies did better in the recession than EMU member countries on a similar level of development. There are obvious advantages and disadvantages of small MICs having a common currency. The point of this article is that the possible disadvantages should be identified and dealt with. Feldstein believes that one possible alternative for some countries, e.g. Greece, is to leave the eurozone and return to their own currency. This is an extreme solution. I do not have such a solution in my mind. I would look for a solution inside the EMU. The question is how to overcome these disadvantages with measures on the national level and with measures on the euro level. This was not the issue of this article. The aim of the article was to build awareness of the difficulties some member countries are facing inside the euro area.

6. CONCLUSIONS

Small middle-income countries inside the euro area are encountering the problem of a possible growth slowdown. Their excessive instability reduces their potential growth rate. Imposed internal surrogate devaluations to increase price competitiveness may direct the structure of such economies into specialising in low-wage, low-tax and low-tech industries, which may hamper their growth potential. Deflationary policies to keep price levels low require depressed aggregate demand which keeps actual growth below the potential growth in the medium term. While an acceleration of growth may be a wishful expectation, a slowdown in growth may be the cruel reality.

These problems could seriously reduce the opportunities and capabilities of small MICs for competitive (i.e., above-average) growth in the euro area in the medium and long run. National economic policies of stabilisation and growth should respond to these challenges. The large high-income countries should recognise the macroeconomic problems of small MICs and allow them to build tailor-made institutions and measures to deal with the problems of the asymmetric effects of the EMU on them. The 'one-size-fits-all' system should be relaxed to some degree. The institutional architecture of the single market and the euro system should be made more flexible (De Grauwe, 2011). Although, there may be a question of whether there should be less or more of a role for nation-states in money and finance (Sapir, 2011), the role of the nation-state should not be undermined.

REFERENCES:

Acemoglu, D., Robinson, J.R. & Verdier, T. (2012). Can't we all be more like Scandinavians? Asymmetric growth and institutions in an interdependent world. *NBER Working Papers*, No. 18441 (Oct.).

Aiginger, K. (2009). Strengthening the resilience of an economy. *Intereconomics*, 44 (5), 309–316.

Balassa, B. (1964). The purchasing-power parity doctrine: A reappraisal. *Journal of Political Economy*, 72 (6), 584–596.

Barro, R. & Sala-i-Martin, X. (1992). Convergence. *Journal of Political Economy*, 100 (2), 223–251.

Blanchard, O. (2007). Adjustment within the euro: The difficult case of Portugal. *Portuguese Economic Journal*, 6 (1), 1–21.

De Grauwe, P. (2011). The governance of a fragile Eurozone. *CESifo Forum*, 2, 40–45.

De Long, J.B. & Summers, L.H. (2012). Fiscal policy in a depressed economy. *Brookings Papers on Economic Activity*, (Mar. 2012).

De Mooij, R. & Keen, M. (2012). Fiscal devaluation and fiscal consolidation: the VAT in troubled times. *NBER Working Papers*, No. 17913 (Mar.).

Eichengreen, B., Park, D. & Shin, K. (2012). When fast growing economies slow down: international evidence and implications for China. *NBER Working Papers*, No. 16919 (Mar.).

Eichengreen, B., Park, D. & Shin, K. (2013). Growth slowdowns redux: new evidence of the middle-income trap. *NBER Working Papers series*, No. 18673 (Jan.).

Estrada, A., Gali, J. & Lopez-Salido, D. (2012). Pattern of convergence and divergence in the Euro area. Paper presented at the *13th Jacques Polak Annual Research Conference*, hosted by the IMF, Washington, DC, November 2012.

Farhi, E., Gopinath, G. & Itskhoki, O. (2011). Fiscal devaluations. *NBER Working Papers*, No. 17662 (Dec.).

Feldstein, M.S. (2011). The euro and European economic conditions. *NBER Working Papers*, No. 17617 (Nov.).

Hausmann, R., Pritchett, L. & Rodrik, D. (2005). Growth accelerations. *Journal of Economic Growth*, 10, 303–329.

Higgins, M. & Klitgaard, T. (2012). Saving imbalances and the Euro area sovereign debt crisis. *Current Issues in Economics and Finance*, 17 (5), 1–11.

Landmann, O. (2011). On the macroeconomics of the European divergence. *CESifo Forum*, 2, 19–25.

Lucas, R. (2000). Some macroeconomics for the 21st century. *Journal of Economic Perspectives*, 14 (1), 159–168.

Mankiw, G., Romer, D. & Weil, D. (1992). A contribution to empirics of economic growth. *Quarterly Journal of Economics*, 107 (2), 407–437.

Porter, M. (1990). *The competitive advantages of nations*. New York: Free Press.

Quah, D. (1996). Twin peaks: Growth and convergence in model of distribution dynamics. *Economic Journal*, 106, 1045–1055.

Ramskogler, P. (2012). Is there a European wage leader? Wage spillovers in the European Monetary Union. *Cambridge Journal of Economics,* 36 (4), 941–962.

Rodrik, D. (2008). The real exchange rate and economic growth. *Brookings Papers on Economic Activity,* Fall 2008 (Conference Draft).

Rodrik, D. (2011). The future of economic convergence. *NBER Working Papers,* No. 17400 (Sep.).

Sapir, A. (2011). Europe after crisis: less or more role for nation states in money and finance. *Oxford Review of Economic Policy,* 27 (4), 608–619.

Senjur, M. (2007). A development club and groupings in Europe, and growth strategies. *Comparative Economic Studies,* 49 (4), 660–682.

Senjur, M. (2010). Differential inflation, Philips curve, and price competitiveness in a new euro-member country. *Economic Change and Restructuring,* 43, 253–273.

Senjur, M. (2012). A competitive growth of a small middle-income country in the eurozone is far to be assured. *International Economics and Economic Policy,* 9 (3), 213–233.

Shambaugh, J.S. (2012). The euro's three crises. *Brookings Papers on Economic Activity,* (Mar. 2012).

Wren-Lewis, S. (2010). Macroeconomic policy in light of the credit crunch: the return of counter-cyclical fiscal policy?. *Oxford Review of Economic Policy,* 26 (1), 71–86.

FIT GAP ANALYSIS – THE ROLE OF BUSINESS PROCESS REFERENCE MODELS

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ABSTRACT: *Enterprise resource planning (ERP) systems support solutions for standard business processes such as financial, sales, procurement and warehouse. In order to improve the understandability and efficiency of their implementation, ERP vendors have introduced reference models that describe the processes and underlying structure of an ERP system. To select and successfully implement an ERP system, the capabilities of that system have to be compared with a company's business needs. Based on a comparison, all of the fits and gaps must be identified and further analysed. This step usually forms part of ERP implementation methodologies and is called fit gap analysis. The paper theoretically overviews methods for applying reference models and describes fit gap analysis processes in detail. The paper's first contribution is its presentation of a fit gap analysis using standard business process modelling notation. The second contribution is the demonstration of a process-based comparison approach between a supply chain process and an ERP system process reference model. In addition to its theoretical contributions, the results can also be practically applied to projects involving the selection and implementation of ERP systems.*

1. INTRODUCTION

Many companies have introduced ERP systems in order to stay competitive and to improve and change their business strategies (Winkelmann, 2012). ERP systems integrate standard business practices that suggest an effective and validated way to perform business operations. The business practices of ERP systems can be presented via reference models. Reference models are generic conceptual models that formalise recommended and generally accepted practices for a certain domain (Fettke & Loos, 2003).

A significant number of information system implementation projects are unsuccessful (Lyytinen & Hirschheim, 1988). Even the latest research shows that 10% of companies have recognised that their ERP project was a failure (Panorama Consulting Solutions, 2013). The

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main reason for this lies in underestimating the complexity of such a project that requires several organisational changes and the involvement of employees (Davenport, 1998).

These days ERP systems need to offer a lot of functionality in order to cope with a large number of business requirements. This functionality needs to be aligned with the business in order to create value for the organisation, confronting the organisation with the options of either configuring the enterprise system, the organisation, or a combination of both (Dreiling, Rosemann, Aalst, Sadiq, & Khan, 2005).

One key success factor when implementing ERP is a focus on business processes and business needs. Even though it is known in theory and in practice that the use of reference models brings many positive economic effects for business, such as a cost, time and risk reduction (Fettke & Loos, 2007; Hilt, 2007; Kirchmer, 2010; Küster, Koehler, & Ryndina, 2006), reference models are still rarely used in practice.

The aim of this paper is to present the use of reference models as a process comparison approach within fit gap analysis. The structure is as follows: based on a literature review, the first part introduces reference models and existing reference model application approaches. The second part explains the high-level and detailed fit gap analysis and suggests a fit gap analysis BPMN (Business Process Modelling Notation) process. The last part of the paper demonstrates a process comparison between a supply chain business process and an ERP process reference model.

2. REFERENCE MODELS

Process design is a key phase of the business process management lifecycle. The resulting models form the basis for process implementation and execution. The use of process templates significantly increases the efficiency and effectiveness of the process design phase. Process templates are generally called business process reference models (Kirchmer, 2010). Developing process models from scratch is a time-consuming and methodologically challenging task. Reference models are information models that are developed with the goal of being reused. They can be used as a starting point for developing company-specific models (Becker, Beverungen, & Knackstedt, 2010).

Reference models have the following characteristics (Fettke & Loos, 2003, 2007; Kirchmer, 2010; Scheer, 1998):
- they represent best practices (providing best practices for conducting business);
- they have universal applicability (representing a class of domains, not a particular enterprise); and
- they are reusable (they can be understood as blueprints for developing information systems, they can be structured to allow easy adaptation to company-specific situations).

Reference models play an important role in activities such as business process engineering (Scheer, 2000), information system development, customising ERP systems (Rosemann &

van der Aalst, 2007) and training and research (Thomas, 2006). In order to be able to use reference models, they must be adapted to the requirements of a specific enterprise.

Reference models represent the content of various domains. The most important types are the following (Fettke & Loos, 2003; Kirchmer, 2010):
- industry reference models (representing the best practices of a specific industry sector);
- software reference models (these can be traditional applications such as ERP systems or a reference model representing a sub-process supported by service-oriented architecture (SOA);
- procedural reference models (e.g., a project management reference model); and
- company reference models (representing best practices within a company or a company group).

The use of reference models has different economic effects on the modelling process (Fettke & Loos, 2007; Hilt, 2007; Kirchmer, 2010; Küster et al., 2006):
- a decrease in costs (reference models can be reused so the development costs of the reference model can be saved);
- a shortening of modelling time (the knowledge contained in the reference model reduces learning and development time, allowing the identification of and a direct focus on critical processes);
- an increase in model quality (reference models are proven solutions and provide better model quality and an awareness of own deficiencies);
- a lessening of modelling risk (the risk of failures when using a reference model can be reduced because reference models are already validated); and
- the reference model content usually bridges the business and the IT (Information Technology) domains. For example, business process models can be linked with pre-defined interface definition models and Web service models.

A possible disadvantage of using reference models is that an organisation might lose some advantage of its unique and perhaps better business practices. If a reference model is widely used by an industry sector, then it can hardly represent a source of a company's competitive advantage. A company should therefore identify which are the key business processes that contribute to its competitive advantage and which could be standardised without losing such advantage.

2.1. ERP system reference models

ERP systems are the world's largest and most complex enterprise systems. ERP systems primarily focus on core intra-company processes, that is, the operations that are performed within an organisation (Magal & Word, 2010). These systems are generic and the functionality they provide can serve a large variety of enterprises. ERP systems are not custom-developed, but are developed by commercial ERP vendors, e.g. Oracle, Microsoft, SAP. The implementing organisation either accepts or rejects the business processes that can be enabled by the ERP (Gulledge, 2006). The implementation of an ERP system

involves a process of customising the generic package and aligning it with the specific needs of the enterprise (Soffer, Golany, & Dori, 2003).

The implementation of ERP systems has become an industry on its own. In particular, small and medium-sized enterprises (SMEs) are unable to afford expensive ERP implementations. The fact that they can help reduce the cost of ERP implementation is one reason that modelling methods, architectures and tools have become increasingly important (Scheer & Habermann, 2000). Some ERP vendors have developed ERP-specific reference models which describe the structure and functionality of the system on a conceptual level. ERP reference models exist in the form of function, data, system organisation, object and business process models, although the latter is clearly the most popular type.

Business process reference models on different levels of granularity describe business processes that can be supported by an ERP system. These models are not only developed for the implementation team, but also for the end users who can gain relevant information about ERP system capabilities and how processes are connected together from the models (Rosemann, 2000). Reference models embedded in an ERP system may serve as a basis for matching the system with the company's requirements (Soffer et al., 2003). The most comprehensive ERP process reference model is SAP's R/3, developed largely in Event-driven Process Chain (EPC) notation. A reference model can also be linked to a system repository which enables the ERP system to be configured by the reference model (Scheer & Habermann, 2000).

2.2. Reference model application methods

From a conceptual point of view, reference modelling consists of construction and application processes (Fettke & Loos, 2007). The term construction process pertains to all activities relevant to the development of a reference model. The term application process refers to all steps required to develop enterprise-specific information models on the basis of reference models (Ahlemann & Gastl, 2007). In this paper, reference modelling will be associated with the reference model application process.

Fettke, Loos and Zwicker (2006) analysed and compared 30 process reference models. Thirteen of them covered some proposals and configuration options for model application. Most of them (twelve) have developed a procedural model for specific application purposes. Statements about concepts for reusing and customising elements within the reference model were only provided for nine reference models. Further, in nine cases the reference models were used on real projects. In the remaining 21 cases, statements concerning real applications were not available.

How a reference model is applied in practice is an important research question. Companies face several issues when they want to answer this question. Some issues are e.g. the different levels of process details, different notations, a partial view of processes, an overemphasis on process activities etc. Two process models can have different structures

and still be compliant with each other. Gerke, Cardoso and Claus (2009) developed an approach and an algorithm which allow the compliance of process models with reference models to be measured. The approach was evaluated by measuring the compliance of a German passenger airline process with the ITIL (Information Technology Infrastructure Library) reference mode. Van der Aalst (2005) introduced a delta analysis to compare the real behaviour of an IS with the expected, reference model behaviour. He employed data mining with transactional IS log data to analyse the underlying processes.

The process of configuring a reference model in line with the demands of an organisation requires users to have a thorough understanding of both the domain and the modelling language in which the reference model has been constructed. Users must not only be domain experts but also skilled in reading and adapting reference models. In practice, where users are unfamiliar with reference models, this assumption is unrealistic. La Rosa, Lux, Seidel, Dumas and Hofstede (2007) proposed a questionnaire-driven approach to reference model configuration. They linked the questions to reference model variation points. Users therefore do not need to deal directly with the reference model and only have to answer questions which are expressed in a natural language.

The development of a reference model is often costly, risky and extensive, which underpins the demand for easy to use adaptation approaches. Adaptive reference models enable automatic modifications of the original reference model, depending on company or project specifics. A few reference modelling approaches have been developed based on adaptive reference models.

Soffer et al. (2003) suggested the ERP modelling approach to capture process variants supported by the ERP system and the interdependencies among them. They used OPM (Object-Process Methodology) as a modelling language which was selected following an analysis of the desired properties a modelling language should possess to be applied in the constructing of an ERP system model. Rosemann and van der Aalst (2007) highlighted the shortcomings of existing reference modelling languages and suggested a configurable reference modelling language which allows the core IS configuration patterns to be captured. The authors pointed out the need for connecting model elements to the ERP system functions in order to perform the model and ERP system configuration concurrently. The configuration approach of each introduced approach is similar. Model variants for different application scenarios are integrated into one model and are predefined. The model variant that is considered the best for a specific application scenario can be selected for real application.

Configurable reference model approaches primarily focus on adapting a reference model to specific business characteristics. A reference model also has to be further adapted to the specifics of a company. Generic modelling approaches (e.g. aggregation, instantiation, specialisation and reusability) are considered appropriate for use when adapting a reference model. Becker, Delfmann and Knackstedt (2007) suggested recommendations for the construction of modelling languages that integrate configurative and generic reference modelling.

Parameterisation plays an important role in the customisation of a reference model. It allows the parameters or variants of a reference model's features (processes, functions, entities) to be set according to an enterprise's requirements (specific business processes and policies). Heuvel and Jeusfeld (2007) suggested a reference model transformation approach involving four steps: 1) the matchmaking: source model is compared to the reference model to identify which reference model is most appropriate; 2) selection: scenarios are chosen from the reference model; 3) enrichment: more details are captured and variants are selected; and 4) integration: the enriched reference model is integrated with target models.

Process merging is a technique that brings several processes models together to create a new process model. Merging can be performed according to a revolutionary or conservative approach. In the revolutionary approach, the reference model is taken as the initial TO-BE model. This model is iteratively customised by integrating parts of the AS-IS model. This approach is primarily used when companies are implementing ERP systems. In contrast, the conservative approach uses the AS-IS model as the initial TO-BE model. This model is then adapted by adding components of the reference model. Küster et al. (2006) introduced the process merging approach for a scenario which focuses on improving an existing AS-IS business process by using a process reference model. The two main steps of their approach are the comparison and derivation of the TO-BE model. In order to visualise relations between the AS-IS process and the reference model they used a tree structural view. They connected process tasks and identified types of task relations e.g. one-to-one, one-to-many, one-to-none, and none-to-one. Based on process mapping they incorporated parts of the reference model into the AS-IS process.

3. FIT GAP ANALYSIS

Task-technology fit theory (TTF) stresses the importance of an alignment between business processes and technology (e.g. ERP systems). TTF theory (Figure 1) holds that IT is more likely to have a positive impact on individual performance and be used if the capabilities of the IT match the tasks the user must perform (Goodhue & Thompson, 1995). Matching IT capabilities with user tasks is achieved by the fit gap analysis process.

Figure 1: *TTF diagram*
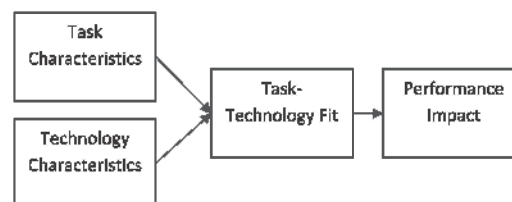
Source: D. L. Goodhue, D. L.Thompson, Task-technology fit and individual performance, 1995, p. 215

Fit gap analysis (also named "gap analysis", "gap fit analysis" or "system needs and product features analysis") is an important phase of an ERP selection and implementation methodology. A critical challenge when implementing ERP first involves identifying gaps between

the ERP generic functionality and a specific organisational requirement, and deciding how those gaps will be handled (Gulledge, 2006; Sawyer, 2001; Soh, Kien, & Tay-Yap, 2000). Fit gap analysis is used to determine the extent of a business process change required for a particular solution as well as determining software customisation and interfacing requirements (Blick, Gulledge, & Sommer, 2000). An organisational misfit requires massive changes to the adopting organisation's business processes, ERP system or both. Matching the ERP's functionality to the way the enterprise does business is a vital factor for the success of an ERP implementation (Laughlin, 1999). Hong and Kim (2002) defined the organisational fit of an ERP system as the congruence between the original artefact of ERP and its organisational context. The findings of a survey of 34 organisations showed that success in ERP implementation depends significantly on the organisational fit of an ERP system.

An ERP system requires extensive customisation in order to roll out production systems. Each organisation has its own unique set of requirements and processes. The fit gap analysis that typically accompanies a development effort represents a major financial drain (Arinze & Anandarajan, 2003). Soh, Kien and Tay-Yap (2000) surveyed the gaps between the functionality offered by the ERP system and that required by the adopting organisation. Their findings suggest that the fit might be worse in Asia because the business models underlying most ERP systems reflect European or US industry practices which are different from Asian business practices. Blick et al. (2000) presented fit gap analysis experiences with ERP implementation for the public sector. In that sector, business processes often differ from private sector processes and more attention should be focused on understanding the gap.

Fit gap analysis is usually built on a request for proposal (RFP) or a request for information (RFI). RFP/RFI summarises a company's business needs (general, technical, functional) that any future ERP system should cover. The fit gap process is often supported by vendor ERP consultants who bridge the gap between the business world and the world of technology (Sawyer, 2001). The main goal of fit gap analysis is to identify and document all fits and gaps based on a comparison of a company's business needs and ERP capabilities, followed by an analysis of each gap, the suggesting of possible alternatives and closing of the gaps by selecting the most appropriate alternatives.

Fit gap analysis is mentioned twice in ERP system implementation methodologies (Microsoft Corporation, 2011). High-level fit gap analysis is usually conducted in the pre-implementation or ERP system selection phase and a complete or detailed fit gap analysis is an essential part of an ERP system analysis phase.

3.1. High-level fit gap analysis

It is very important to select an appropriate ERP system. The selection process should be based on a comparison of business needs and the capabilities of a given ERP system. High-level fit gap analysis is an approach that helps determine how the ERP system supports a company's business needs (Sawyer, 2001). Important preconditions for conduct-

ing a high-level fit gap analysis are that business needs (business strategy, processes and requirements) have been identified and that executive project sponsor support is in place (Indihar Štemberger & Kovačič, 2008; Laughlin, 1999).

The objectives of high-level fit gap analysis are: 1) to validate and understand the degree of fit between an ERP system and business and IT needs; 2) to identify the major customisations that will be required to address those requirements; and 3) to provide an understanding of how the ERP system will work in the particular business environment.

A high-level fit gap analysis process is presented as a BPMN model in Figure 2. The process consists of the following steps:
- a review of business needs and ERP system capabilities;
- the selection of a comparison approach; and
- a comparison of business needs with ERP system capabilities and the documentation of fits and gaps.

Reviewing business needs and ERP system capabilities

The initial step is to review the company's business needs and existing legacy systems. Business needs are best described by an organisation's strategy and business processes (Indihar Štemberger & Kovačič, 2008). Business needs should be connected to the company's process architecture. This is important for it allows companies to know how their business needs are linked to their business process activities and which processes are affected. Business needs should also have a defined priority and the impact they have on business and the business strategy. On one hand, ERP capabilities can be presented by ERP consultants, user and training materials, or company reference visits. Another way to present the capabilities of an ERP system is to use process reference models.

Selecting a Comparison Approach

The most commonly used fit gap analysis approach is simulation-based, whereby a company's business processes are executed within the ERP system and set up as a pilot or sandbox test system. The review of business needs within the company is usually done through detailed workshops involving key users and ERP system application consultants. A workshop serves to identify gaps in the ERP system compared to the customer's needs. The consultant executes business processes in the system and the key users monitor and review whether all of the required activities in the business process can be executed. If the key users have been trained to use the ERP system, they may themselves execute the business processes. Users usually compare the new ERP system with the solutions that are currently in use. It is recommended to include a business analyst in order to ask critical questions and help key users understand the ERP system. However, a simulation-based method might restrict the fit gap analysis solely to a comparison with the test implementation and miss important process optimisation opportunities.

Other popular fit gap comparison approaches in business practice are (Prakash & Madhup, 2011):

- Brainstorming discussion based: Highly skilled ERP system consultants present and discuss capabilities with other stakeholders of a project. Such an approach is most appropriate for an upgrade project or resolving critical issues of an implementation.
- Questionnaire based: This approach is based on a questionnaire prepared by ERP consultants. The questionnaire contains questions related to both the company's needs and ERP system capabilities. Key domain expert users provide answers and attach additional data and documents. This method is suitable for companies that are already using an ERP system, i.e. for upgrade or implementation project types. The main advantage of the questionnaire method is that it is fast to execute although, on the other hand, there is a risk that not all of the required information will be obtained if responses are poor in quality. A questionnaire-driven approach to reference model configuration was proposed by La Rosa et al. (2007). Their main idea was to link questions to the reference model. End users therefore do not need to have knowledge of the reference model or the language in which the reference model was written. They only need to answer domain-specific questions written in a natural language.
- Process-based: A description and demonstration of a process-based comparison approach is presented in section 4.
- Hybrid: With a hybrid approach, all of the approaches suggested above can be used. It usually starts with a brainstorming discussion followed by ERP system simulations. At the end, questionnaires are administered. The hybrid method provides the best output of a fit gap analysis, but it also requires the most effort and investment.

Comparing business needs with ERP system capabilities

Based on the selected comparison approach we first compare each business need with the capabilities of an ERP system. If the ERP system does not support a business need, we document the business need as a gap and give estimations of the time and costs required. Gaps can arise from company-specific, public-sector-specific or country-specific requirements that do not match the capabilities of an ERP system (Soh et al., 2000). If an ERP system supports a business need, there are two options. If additional configuration of an ERP system is needed then we document the business need as an ERP system configuration and estimate the configuration time and costs while, on the other hand, if no configuration is needed then we document the business need as a standard ERP system functionality.

Potential outputs of a high-level fit gap analysis are (Microsoft Corporation, 2011):

- a high-level fit gap list of requirements with an explanation of how these would be addressed as part of an implementation and an estimation of the effort that this work would require; and
- a high-level fit gap report explaining the business needs discusses the functionality fit of an ERP system, reviews the key design points, discusses customisations and integration requirements, and reviews the proposed conceptual design and lists any assumptions made.

The degree of fit is an important indicator of business alignment with the standard ERP system functionality. It is calculated as the sum of all business needs that fit, divided by all business needs. Besides standard ERP system capabilities, the business needs categorised as fit are ERP system configurations and adaptations of a company's business processes. In addition, each business need should be weighted in terms of its importance (e.g. nice-to-have or critical). The degree of fit helps companies understand the risk of not meeting the project's scope and provides an important estimation needed in the ERP system selection process (Babić, 2009a).

Alternatives characterised within a high-level fit gap analysis as a business fit are:
- standard ERP system capability; and
- ERP system configuration.

Standard ERP system capability

Standard capabilities are met by the system out-of-the-box, without requiring additional effort or configuration time. This is by far the most preferable outcome. In practice, there are typically many of these because the majority of tasks and processes are common to all companies and are therefore supported by ERP systems. Examples of standard ERP system capabilities are: the possibility to handle inventory in multiple locations, establishing and observing credit limits for customers or handling reservations of goods throughout the system (Babić, 2009a).

ERP system configuration

ERP configuration (also called customisation) entails choosing from among the reference processes and setting the parameters in ERP to reflect organisational features without changing the ERP source code (Brehm, Heinzl, & Markus, 2001; Glass, 1998). Business needs are met out-of-the-box, but the ERP system has to be configured or set up using the front-end tools before it can be used. Configuration of an ERP system requires some consulting work, but without custom code development. If a gap can be closed through configuration, the costs and risks are minimised (Blick et al., 2000). Configuration costs and time must be estimated, including the configuration settings and setup values. Examples of business needs addressed by an ERP system configuration are: handling sales or purchase approval workflows (no programming), setting up specific requisition planning systems, defining organisational units or the creation of standard reports (Brehm et al., 2001).

3.2. Detailed fit gap analysis

A detailed fit gap analysis is executed within the analysis phase of an ERP system implementation. If a high-level fit gap analysis has already been completed, then it is used as a starting point for a detailed fit gap analysis. The steps in conducting a high-level fit gap analysis were

described in the previous section. In a detailed fit gap analysis, we focus on how the identified gaps can be resolved. An overall detailed fit gap analysis process is presented in Figure 2.

Documented gaps serve as the basis for the consulting team to validate gaps, find resolutions and propose the most appropriate alternatives. Alternatives can be evaluated and compared based on analysis, e.g. SWOT analysis or cost benefit analysis (CBA). CBA is a structured evaluation of the cost of various plausible and viable alternatives to a gap, compared to the business benefit of each. Although the least cost alternative is often determined to be the most attractive, this is not always the case. That is because qualitative, legal, and human resource aspects may need to be considered and factored into the decision. It is often useful to list alternatives, document the alternative resolution options, the costs versus benefits of each, the formal recommendation, and the reasoning behind it. The selected gap resolution is a business decision that needs to be made by the customer's business decision maker (senior-level executive project sponsor who monitors the implementation project).

Business needs identified as a gap can be resolved by (Microsoft Corporation, 2011):
- adapting a company's business processes;
- adapting an ERP system through customisation;
- adding a new business solution and/or software vendor; or
- providing a workaround so that the business can function.

Adaptation of Business Processes

A company decides to undertake a process change when a reasonable match between a business need and a standard ERP system exists, and adaptation would otherwise be required. This alternative is also named a technology-driven approach (Arif, Kulonda, Jones, & Proctor, 2005). It means that best practices implemented in these software packages have to be applied within an organisation. Although it is theoretically the best way that allows an organisation to take all possible advantage of an ERP system, such changes are very hard to implement in practice. It means that an ERP system implementation project has to include a business process redesign project, rendering the situation much more complicated. Many vendors are concerned with the complexity and therefore with the strong threat of failure. Besides, an organisation might lose the advantage of having a unique and perhaps better business practice (Davenport, 1998; Indihar Štemberger & Kovačič, 2008; Trkman, 2010).

Adaptation of an ERP System

Technological adaptation refers to adjustments and changes following the installation of a new technology in a given setting (Tyre & Orlikowski, 1994). The adaptation of an ERP is selected if a business need cannot be met by standard ERP system functionalities and requires some or even extensive custom development. It requires changing the package code to perform a unique business process. Due to the way ERP systems are designed, some tailoring is always required to get them up and running. The extent of the adapta-

tion can vary from one organisation to the next, based on several factors. One factor is the degree of fit between the features and functions of the package and the business processes of a particular organisation (Brehm et al., 2001).

A general ERP vendor recommendation is that any alternatives that count as a fit should be always considered beforehand. Adaptation of an ERP system is not a desirable outcome (Babić, 2009b; Brehm et al., 2001). It can cause high additional costs, increase project time and risk (Laughlin, 1999). Moreover, it presents difficulties with maintenance and upgrading to new releases. Therefore, this alternative can lead to the failure of a project. ERP system customisation is appropriate for those companies which believe their business processes are better than those implemented in an ERP system and do not want to lose their competitive advantage (Indihar Štemberger & Kovačič, 2008). ERP system customisation time and costs must also be estimated in this phase. Examples of custom-developed business needs are: integration with industry or best-of-breed systems, workflow programming, interface development, extended reporting, automated customer billing etc.

Combining with Other Solutions

The placement of third-party solutions (also called bolt-on or add-on solutions) reduces the effort required to configure and otherwise tailor an ERP to industry-specific needs. If the implementation partner cannot meet business needs, it is possible to engage a third-party vendor (independent software vendor, ISV). The new vendor can provide a vertical or industry solution that supports a customer's specific needs. Further, the third-party vendor is responsible for quality assurance and maintenance, reducing the burden on the adopter. However, third-party solutions introduce complexity. In addition, there may be a release lag whereby a third-party vendor is supporting an older release of an ERP system than the one the implementation partner is currently offering to its customers. This is likely to be an issue during upgrading of an ERP system (Brehm et al., 2001). When selecting a third-party vendor, it is important that it complement the ERP system and add strategic value to the customer. New software should round out the solution and give a competitive advantage to the customer. Also important in the selection is a consideration of the impact of the third party on the entire project (Microsoft Corporation, 2011).

Out of Scope or Future Release

Business needs in the current project will not be supported and will be documented as out of scope or planned for future releases. This alternative leads to 'living with problems', which means that an organisation uses an ERP system that is not tailored to the way business is done. To enable the business to function, a viable workaround must be provided, e.g. using Microsoft Office tools.

Identified resolutions must be discussed with the customer when the complete solution approach is finalised and documented. The best possible alternative in the majority of

cases has proved to be a composite approach, i.e. a blend of acquired (ERP), integrated (best-of-breed) and engineered (adapted or built) applications. It seems optimal for standard business processes (e.g. accounting processes) to adapt to best practices, whereas customised business processes (e.g. order fulfilment) should in many cases adapt to company's business needs (Indihar Štemberger & Kovačič, 2008).

Figure 2: *Detailed Fit Gap Analysis Process*
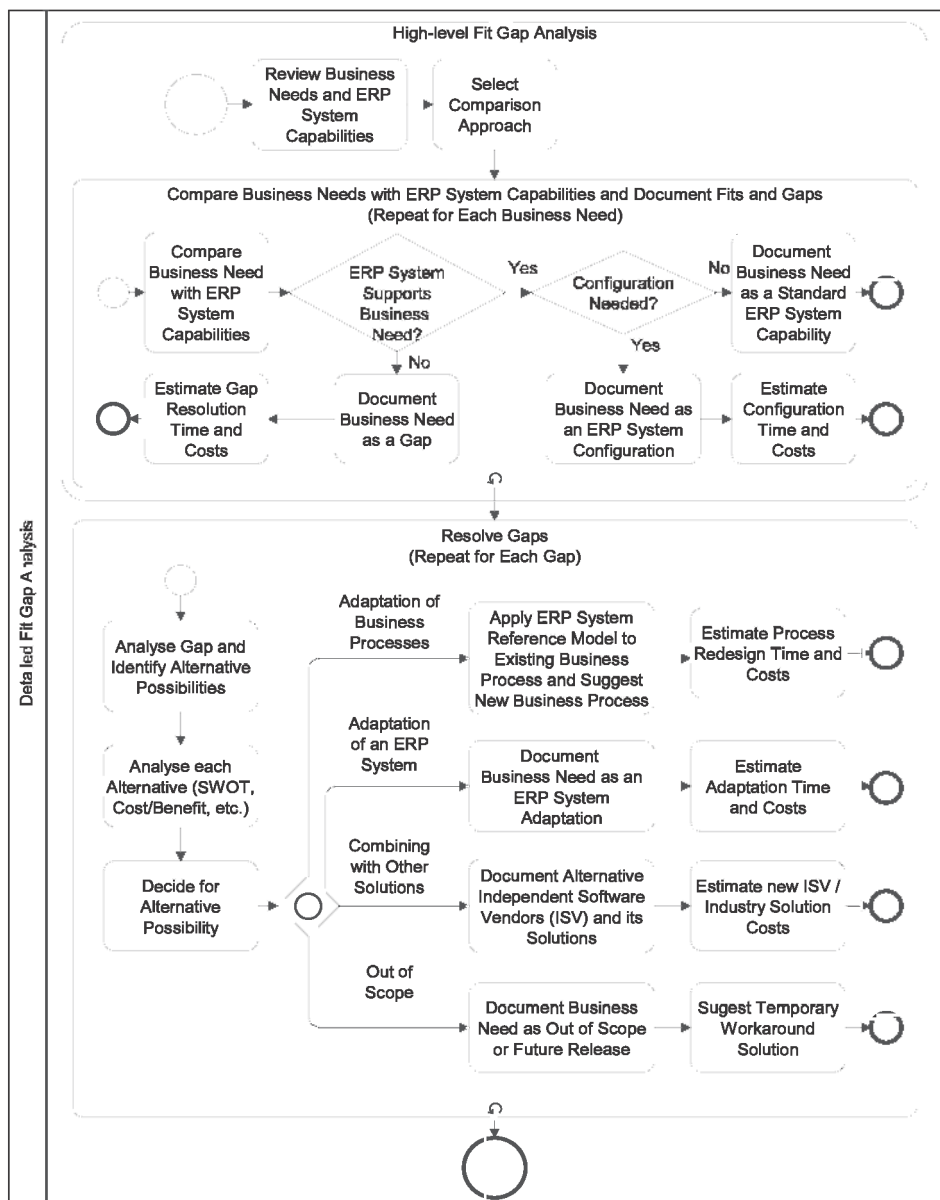
4. DEMONSTRATION OF A PROCESS COMPARISON APPROACH

The traditional approach to scoping an ERP project is based on a modular-oriented functional fit gap analysis. This means that the functionality of each ERP module is compared with some definition of the functional requirements of the receiving organisation. In most of such consulting engagements, ERP consultants are asked to provide an unbiased analysis of the alignment of standard software with the business processes of the implementing organisation. Modules are isolated silos, and a modular-based fit gap analysis compares functionality within silos. Business processes flow across the silos and they hence represent the output/capability delivery of the implementing organisation. A fit gap analysis with a business process orientation provides an understanding of how the software would enable the end-to-end business, as opposed to comparing static functions within silos (Gulledge, 2006).

Process comparison is one of the fit gap analysis approaches such as simulation, brainstorming discussion or questionnaires. Each business need should be connected to an ERP system reference model process or activity. The process-based approach is often combined with other approaches, e.g. the questionnaire-based approach. A strong motivation for ERP vendors to develop reference models for their solutions has been to support the process-based selection of their systems (Rosemann, 2000).

This approach requires both an ERP system reference model and AS-IS company process models. At least until the beginning of the ERP selection, the process models should not be too detailed. Such a process model comparison has to deal with (Rosemann, 2000):
• different levels of abstraction in the models;
• different modelling languages (Soffer et al., 2003);
• different scopes (length and width) of the processes;
• differences in additional information (organisational units, input data, documents, related transactions); and
• different ways of naming.

TTF theory states that only standardised processes bring standardised tasks that can be supported by a proper technological solution. The use of business process reference models within ERP implementation projects is leading to an increase in the standardisation of processes – one of the critical success factors of BPM (Trkman, 2010).

A process comparison could be achieved by using the reference model application methods found in the literature, e.g. the process merging technique suggested by Küster et al. (2006). Our demonstration shows how a company's supply chain processes are compared to an ERP system process reference model. The comparison approach is part of a high-level fit gap analysis. First, the Microsoft Dynamics NAV process reference model is presented and, in the second section, supply chain processes are connected to an ERP system process reference model. Process models are designed using BPMN notation, the world renowned standard (Object Management Group, 2011).

4.1. The Dynamics NAV process reference model

Dynamics NAV is an ERP system for SMEs (25–250 users). It is part of the Microsoft Dynamics business products family. Dynamics NAV is globally present, supporting 42 localisations – versions for a specific country or region. More than 94,000 organisations are using Dynamics NAV to support their daily operations. The system is implemented by Microsoft certified partners (value-added resellers) which have full access to the system business logic source code (Microsoft Corporation, 2013).

The reference model processes we are using for the demonstration case are available online (Pajk, 2013). The main reference processes used in the comparison are the sales and purchase processes.

Figure 3: *Reference model process: Sales Process – Order-to-Cash Cycle*

www.dynamicsnavprocesses.com
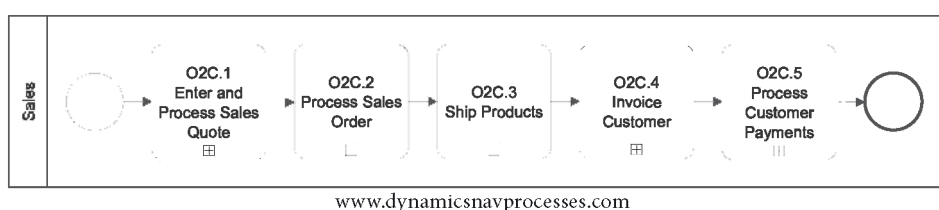
The sales process is also known as the "Order-to-Cash" (O2C) cycle. The overall process includes all activities from marketing and sales to customer-care processes. The sales reference model starts with a sales quotation process. After a quotation is confirmed, it is converted into a sales order. The order is further processed, confirmed and prepared for delivery. The warehouse staff pick up, pack and ship the orders. After the items have been sent out, an invoice is prepared and sent to the customer. At the end, money is collected and customer payments are recorded within the system.

Figure 4: *Reference model process: Purchasing process – Purchase-to-Pay Cycle*

www.dynamicsnavprocesses.com
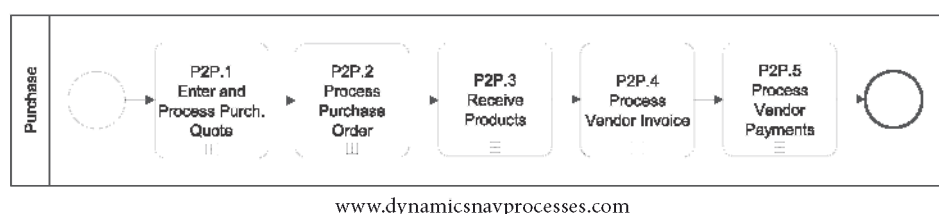
The purchasing process or Purchase-to-pay (P2P) cycle covers the activities of requisitioning, purchasing, receiving and paying for goods and services. The purchase initiative can originate from make-to-order sales or production processes. Most companies base their purchases on sales forecasts. The process starts with RFQ (Request for Quotation) which is sent to a number of vendors by the purchasing department. The quotations received are compared with each other and the vendor is selected. The process continues

by creating and confirming the purchase order. When receiving goods the receipt document must match the company's purchase order. The invoice received from the vendor must be compared to the purchase order and receipt. Accepted and confirmed vendor invoices are posted in the system and paid via electronic banking on the due date.

4.2. A company's supply chain process

The case demonstrates the comparison of a company's supply chain processes to an ERP system process reference model. Figure 5 not only shows a company's processes but also the retail, carrier and suppliers' processes. The process model clarifies how processes are executed through the supply chain and displays the information flow with the related documents that are exchanged among the supply chain nodes.

The company would like to support its business processes by implementing an ERP system. An important phase of the ERP selection is a high-level fit gap analysis. The com-

Figure 5: *The Company's Supply Chain Process*
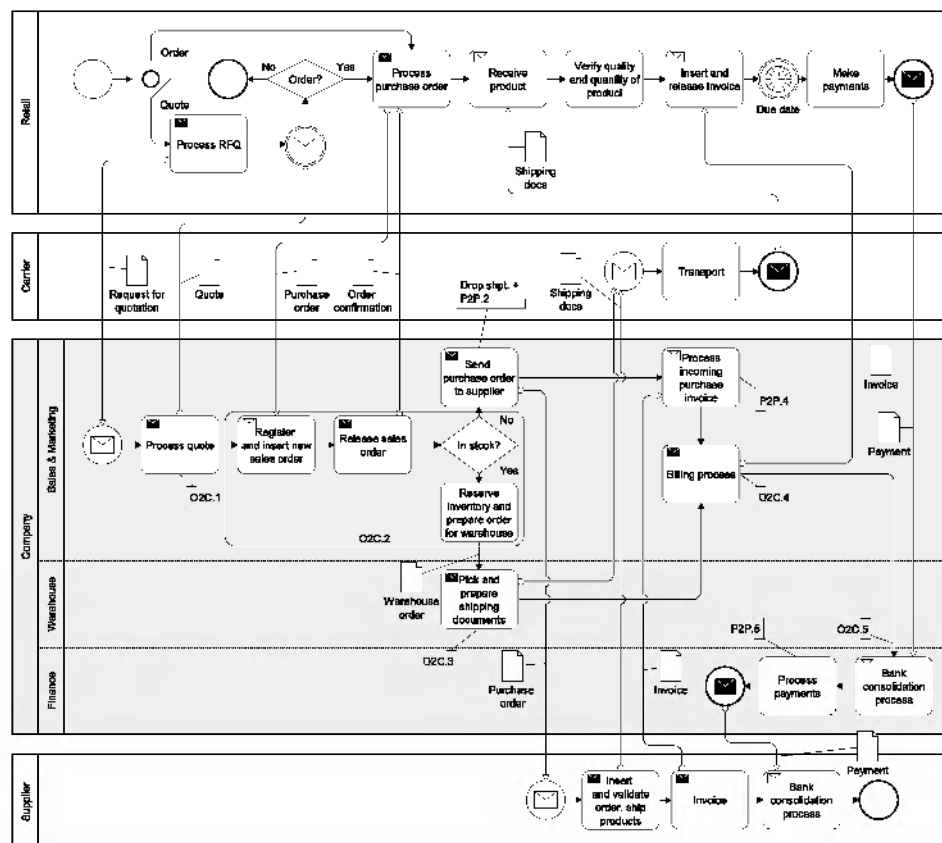
parison approach selected was a process comparison. The comparison is achieved by using the Dynamics NAV process reference model described in section 4.1.

The process comparison could be done by process domain experts or key users with the help of ERP system application consultants. Key users must therefore have basic knowledge of the business processes and BPMN notation. The process activities are linked to process reference model sub-processes at workshop meetings. Each process activity has a corresponding sub-process number, e.g. O2C.1, O2C.2, P2P.5 etc. The company's supply chain process visually shows how the process activities are connected and supported by the Dynamics NAV ERP system.

The process comparison could be used as a starting point for a detailed fit gap analysis or as a visual estimation of how a selected ERP system fits with the company's business needs.

Conclusion

Reference models have been defined in this paper as generic conceptual models which formalise recommended practices for a specific domain. The concept has been introduced to improve the selection and implementation phases of ERP systems. Reference models enable a company to use validated business processes and apply them to its specific needs.

Many companies are concerned that, by applying general reference models, they could lose the advantage of having a unique and perhaps better business practice. The decision about following the best practice approach or innovating is strategic. It calls for a clear prioritisation and categorisation of business processes. On the other hand, changes in demand and economic instability are forcing companies to react to changes in the business environment quickly and effectively. Following validated business practices in dynamic business environments could improve the agility of a company, which in turn could represent a strategic competitive advantage.

An important criterion used when selecting an ERP system is the fit with a company's current business processes. Fit gap analysis holds important consequences for project success (Hong & Kim, 2002). One of the output metrics of the analysis is the degree of fit. Even though the metric is only an estimation, it provides a high-level overview and understanding of the project risk. A low degree of fit could also lead to a decision to select an ERP system of another vendor or to not select an ERP system at all.

This paper focused on reference model application approaches. As an application approach, we described a process comparison as part of a fit gap analysis. In a process comparison, enterprise-specific models are compared with the ERP reference model. The fit gap analysis BPMN process model represents the first contribution of the paper. It provides a description of activities, steps and possible outcome alternatives. The dem-

onstration of the process comparison approach constitutes the practical contribution of this paper. The comparison approach can be used within fit gap analysis as a standalone or in combination with other comparison approaches. The suggested process comparison approach compares the Dynamics NAV process reference model and a supply chain business process.

The paper has many limitations and possible avenues for future work. It is necessary to conduct more empirical research on the application of reference models to determine how a reference model can be used in practice (Fettke & Loos, 2007). In this paper, the reference model process comparison approach is presented based on a supply chain process example only. A survey or multiple case studies analysing process comparison approaches used in practice (e.g. by Slovenian companies) is one opportunity for future research. Robust fit gap techniques are also needed to enable customers to identify the differences between an ERP system and their current business processes and needs (Sawyer, 2001). The development of process-based fit gap approaches using reference models relying on design science research recommendations is an important area of future research, especially for practice. Process reference models can be used in all phases of an ERP implementation lifecycle (Rosemann, 2000). Microsoft Dynamics Sure Step is a product-specific ERP implementation methodology. Possible future work could involve the application of process reference models within all Dynamics Sure Step implementation phases (Diagnostic, Analysis, Design, Development, Deployment and Operation).

REFERENCES:

Ahlemann, F. & Gastl, H. (2007). Process model for an empirically grounded reference model construction. In *Reference modeling for business systems analysis* (Vol. 1, pp. 77–97). Hershey, London.

Arif, M. et al. (2005). Enterprise information systems: Technology first or process first? *Business Process Management Journal*, 11 (1), 5–21.

Arinze, B. & Anandarajan, M. (2003). A framework for using OO mapping methods to rapidly configure ERP systems. *Commun. ACM*, 46 (2), 61–65.

Babić, V. (2009a). The value of degree of fit: Understanding risks. *Navigate Into Success*. Retrieved from http://vjeko.com/blog/the-value-of-degree-of-fit-understanding-risks

Babić, V. (2009b). Top 7 reasons why to avoid (much) customization. *Navigate Into Success*. Retrieved from http://vjeko.com/blog/top-7-reasons-why-to-avoid-much-customization

Becker, J., Beverungen, D. F. & Knackstedt, R. (2010). The challenge of conceptual modeling for product-service systems: Status-quo and perspectives for reference models and modeling languages. *Information Systems and E-Business Management*, 8(1), 33–66.

Becker, J., Delfmann, P. & Knackstedt, R. (2007). Adaptive reference modeling: Integrating configurative and generic adaptation techniques for information models. *Reference Modeling*, 27–58.

Blick, G., Gulledge, T. & Sommer, R. (2000). Defining business process requirements for large-scale public sector ERP implementations: A case study. In *Proceedings of the European Conference on Information Systems* (pp. 3–5).

Brehm, L., Heinzl, A. & Markus, M. L. (2001). Tailoring ERP systems: A spectrum of choices and their impli-
cations. In *Proceedings of the 34th Annual Hawaii International Conference on System Sciences, 2001* (p. 9).

Davenport, T. H. (1998). Putting the enterprise into the enterprise system. *Harvard Business Review,* 76 (4),
121-131.

Dreiling, A. et al. (2005). Model-driven process configuration of enterprise systems. *Wirtschaftsinformatik
2005,* 687–706.

Fettke, P. & Loos, P. (2003). Classification of reference models: A methodology and its application. *Informa-
tion Systems and e-Business Management, 1*(1), 35–53.

Fettke, P. & Loos, P. (2007). Perspectives on reference modeling. In *Reference modeling for business systems
analysis* (pp. 1–21). Hershey, London.

Fettke, P., Loos, P. & Zwicker, J. (2005). Business process reference models: Survey and classification. In *Lec-
ture Notes in Computer Science* (Vol. 3812/2006, pp. 469–483). Presented at the Workshop on Business Proc-
ess Reference Models (BPRM 2005), Nancy, France.

Gerke, K., Cardoso, J. & Claus, A. (2009). Measuring the compliance of processes with reference models (Vol.
5870, pp. 76–93). Presented at the On the Move to Meaningful Internet Systems: OTM 2009, Springer.

Glass, R. L. (1998). Enterprise resource planning–breakthrough and/or term problem? *SIGMIS Database,* 29
(2), 13–16.

Goodhue, D. L. & Thompson, R. L. (1995). Task-technology fit and individual performance. *MIS quarterly,*
213–236.

Gulledge, T. R. (2006). ERP gap-fit analysis from a business process orientation. *International Journal of
Services and Standards,* 2 (4), 339–348.

Heuvel, W. & Jeusfeld, M. (2007). Model transformations with reference models. *Enterprise Interoperability
II,* 63–75.

Hilt, B. (2007). Predefined reference models – a »living guide« containing proven process knowledge that
anyone can use. IDS Scheer AG: ARIS Expert Paper.

Hong, K.-K. & Kim, Y.-G. (2002). The critical success factors for ERP implementation: An organizational fit
perspective. *Information & Management,* 40 (1), 25–40.

Indihar Štemberger, M. & Kovačič, A. (2008). The role of business process modelling in ERP implementation
projects. In *Proceedings of the Tenth International Conference on Computer Modeling and Simulation* (pp.
260–265). IEEE Computer Society.

Kirchmer, M. (2010). Reference Models to Empower MPE. In *High Performance Through Process Excellence*
(pp. 85–100). Springer Berlin Heidelberg.

Küster, J., Koehler, J. & Ryndina, K. (2006). Improving business process models with reference models in
business-driven development. In *Business Process Management Workshops* (pp. 35–44).

La Rosa, M. et al. (2007). Questionnaire-driven configuration of reference process models. In *Proceedings of
the 19th international conference on Advanced information systems engineering* (pp. 424–438).

Laughlin, S. P. (1999). An ERP game plan. *Journal of Business Strategy,* 20 (1), 32–37.

Lyytinen, K. & Hirschheim, R. (1988). Information systems failures - a survey and classification of the empiri-
cal literature. In *Oxford surveys in information technology* (pp. 257–309).

Magal, S. R. & Word, J. (2010). *Integrated business processes with ERP systems, preliminary edition* (Prl.). Wiley.

Microsoft Corporation. (2011). *Microsoft Dynamics Sure Step methodology.*

Microsoft Corporation. (2013). Dynamics NAV. Retrieved from http://www.microsoft.com/en-us/dynamics/erp-nav-overview.aspx

Object Management Group. (2011). Business process model and notation (BPMN), Version 2.0. Retrieved from http://www.omg.org

Pajk, D. (2013). Dynamics NAV Processes (registration required). Retrieved from www.dynamicsnavprocesses.com

Panorama Consulting Solutions. (2013). 2013 ERP report, independent ERP research and analysis. http://panorama-consulting.com/resource-center/2013-erp-report/ (accessed February 25, 2013).

Prakash, P. & Madhup, P. (2011). Methods of fit gap analysis in SAP ERP projects. Infosys.

Rosemann, M. (2000). Using reference models within the enterprise resource planning lifecycle. *Australian Accounting Review*, 10 (22), 19–30.

Rosemann, M. & van der Aalst, W. M. P. (2007). A configurable reference modelling language. *Information Systems*, 32 (1), 1–23.

Sawyer, S. (2001). A market-based perspective on information systems development. *Commun. ACM*, 44 (11), 97–102.

Scheer, A.-W. (1998). *Business process engineering study edition: Reference models for industrial enterprises* (1st ed.). Springer.

Scheer, A.-W. (2000). *ARIS: Business process modeling* (3rd ed.). Springer.

Scheer, A.-W. & Habermann, F. (2000). Enterprise resource planning: Making ERP a success. *Communications of the ACM*, 43 (4), 57–61.

Soffer, P., Golany, B. & Dori, D. (2003). ERP modeling: A comprehensive approach. *Information Systems*, 28 (6), 673–690.

Soh, C., Kien, S. S. & Tay-Yap, J. (2000). Enterprise resource planning: Cultural fits and misfits: Is ERP a universal solution? *Communications of the ACM*, 43 (4), 47–51.

Thomas, O. (2006). Understanding the term reference model in information systems research: History, literature analysis and explanation. In *Lecture Notes in Computer Science* (Vol. 3812/2006, pp. 484–496). Presented at the Workshop on Business Process Reference Models (BPRM 2005), Nancy, France.

Trkman, P. (2010). The critical success factors of business process management. *International Journal of Information Management*, 30 (2), 125–134.

Tyre, M. J. & Orlikowski, W. J. (1994). Windows of opportunity: Temporal patterns of technological adaptation in organizations. *Organization Science*, 5 (1), 98–118.

Van der Aalst, W. M. (2005). Business alignment: Using process mining as a tool for delta analysis and conformance testing. *Requirements Engineering*, 10 (3), 198–211.

Winkelmann, A. (2012). Reference model maintenance based on ERP system implementations. *AIS Transactions on Enterprise Systems*, 3, 28–35.