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BUILDING AND TRANSFERRING HUMAN CAPITAL VIA MIGRATION[1]

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Abstract

This paper aims to explore how human capital is built and transferred via international migration. The paper is based on data from a large-scale survey with 30,000 participants from nine European countries. The survey examined several skills and competences acquired via international migration: self-confidence, learning to adapt to new cultures, ability to deal with new challenges, learning a language, acquiring formal qualifications and learning new skills. The key research question is how skills and competences are associated with specific types of tacit and explicit knowledge. The survey data are analysed via non-parametric tests and ANOVA procedure. The main finding is that knowledge acquisition and transfer differs among different socio-economic groups. Females, for example, seem to benefit more from embodied knowledge than males. Embrained and embedded knowledge is considered more valuable by tertiary graduates than people with secondary education.

Keywords: International migration, Knowledge transfer, Tacit knowledge.

JEL Classification: E24, J24, O15.

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1. Introduction

The international migration has been on rise in past decades in Europe. Significant part of the total migration in Europe referred to the intra-European migration flows. The average annual stock increased from 9.1 mil-lion in the period 1997 – 2004 to 13.7 million in the period 2005 – 2013 in the EU (Eurostat, 2016). The intra-European movements were assisted by the visa-free travel arrangements for EU nationals, but also by many national and European-wide programmes assisting some special forms of mobility. Young Europeans, for example, benefited from the ERASMUS programme and other measures supporting intra-European mobility by young people. According to the European Commission, over 272 thousand students participated in the ERASMUS programme in 2013/2014. The ERASMUS supported about one third of all student migration within the EU/EEA area in the same year (European Commission, 2015). The intra-European mobility benefited not only from the Bologna process, but also from growth in travel by independent young travellers.

International migration is a transformative experience for young people. The young migrants learn language and culture of their host countries. Students and workers acquire new qualifications. They also accumulate other valuable skills and competences, such as learning new skills and ability to deal with challenges. Many young people have to learn how to arrange their travel and accommodation, and organise their work / study abroad. New skills and competences acquired via migration tend to boost self-confidence.

Literature on knowledge, skills and competences recognises two distinctive types of knowledge (Nonaka and Von Krogh, 2009). The 'explicit knowledge' refers to knowledge, which is easily to express and formulate in speech, writing or drawing. The 'tacit knowledge' refers to knowledge we know we have, but are unable to formulate and record Polanyi (1958). It, for example, is easy to transfer pictures or descriptions of a bicycle. One, however, cannot learn how to ride a bicycle from words or drawings. One can learn to ride a bicycle only via personal experience, i.e. 'learning by doing' (Maskell and Malmberg, 1999). Other examples of tacit knowledge include managerial skills, understanding cultural and social norms, and/or personal competences, such as fluency in foreign language and self-confidence. Key distinctions between explicit and tacit knowledge can be summarised in following way:

- Explicit knowledge is based on knowledge of facts. It is easy to codify and transfer across the people, borders, distances and cultures.
- Tacit knowledge is difficult to codify and transfer. It can be acquitted only via personal experience, such as sensory inputs, and/or observing and intuitive imitating other people (Bandura and Walters, 1977; Howells, 2000). Acquisition of tacit knowledge is often automatic and the learner is not aware of the knowledge gained (Taylor, 2007).

The tacit and explicit knowledge are not completely separated. They rather represent two opposite sides of the 'knowledge continuum' (Blackler, 2002). The literature on tacit knowledge recognises four transitory stages between tacit and explicit knowledge (Inkpen and Dinur, 1998; Bathelt and Henn, 2014):

- The *embrained knowledge* ('know what') refers to acquisition of new skills. It is shaped by cognitive abilities. The embrained knowledge often involves acquisition of formal skills and qualifications, such as courses, certificates and diplomas. The embrained knowledge involves explicit knowledge learn by an individual (explicit element), but also ability to draw conceptual frameworks from facts learned via formal learning (tacit element).
- The *encultured knowledge* ('doing what where') involves learning and understanding social and cultural norms. These norms may refer to foreign cultures and ethnicities, but also to rules established and shared by organisations and social groups.
- The *embedded knowledge* ('know why') represents understanding contextual information. An individual learns procedures and routines governing organisations and societies.
- The *embodied knowledge* ('know how') is learned only via personal experience (often sensorial), via 'learning by doing'. It is stored both in body and mind. The embodied knowledge is related to personal competences in coping with tasks, problems and challenges.

The vast literature on human capital mostly concentrates on acquisition of explicit knowledge. This is understandable, because the explicit knowledge can easily be approximated by formal schooling. There, for example, are abundant data on internationals students, study programmes for foreign students and / or brain drain / brain gain. Much less is known about building and transferring tacit knowledge. The tacit knowledge is acquired and transferred via personal experience and/or informal learning, Information on tacit knowledge cannot be obtained from statistics or official reports on student mobility. Information on tacit knowledge built and transferred via international migrants can be obtained only via personal communication with migrants.

There is limited literature on tacit knowledge acquired and transferred via international migration. Some authors (Hagan, Demonsant and Chávez, 2014; Hagan and Wassink, 2016) based their research on case studies and in-depth interviews. The qualitative studies are limited by low numbers of participants. This paper adopts different approach. It is based on information provided by a large-scale European survey. We use perspective of tacit and explicit knowledge to conceptualise skills and competences acquired by young European migrants. The key research question is: 'how skills and competences are associated with specific types of tacit and explicit knowledge?'. The survey data are analysed via

non-parametric tests and ANOVA procedure. The conclusions summarise major findings and limitations, and point to directions for further research.

2. The European sample

The data were generated in the YMOBILITY project. The large panel survey (30,000+ respondents) was implemented in nine European countries by an international polling agency. The project studied causes and outcomes of intra-European migration by young people. The survey targeted young population in age bracket 16–35 year in each country. Both migrants and non-migrants were members of the sample. The total sample involved 949 current migrants and 3250 returned migrants from nine countries.

The YMOBILITY project studied how the young Europeans asses their experience abroad. Six questions explored acquisition of diverse forms of human capital: 'How important to you has your experience abroad been in terms of the following factors:

(i) acquiring formal qualifications;
(ii) learning new skills;
(iii) ability to deal with new challenges;
(iv) self-confidence;
(v) learning a language;
(vi) learning to adapt to new cultures.

The survey participants answered on the Likert scale from 1= not at all important to 5 = very important.

Our analysis distinguishes between knowledge acquired and transferred by current migrants and returned migrants.

We firstly applied the factor analysis to find whether there were perceived similarities between types of knowledge acquired by migrants and returnees (Table 1).

The factor analysis explained 72.69% of the total variance in the returnees sample, 76.99% in the current migrant sample and 73.44% in the total sample. The formal qualifications and new skills formed one factor, while the ability to deal with challenges, self-confidence, language knowledge and ability to adapt to new cultures formed another one. We further refer to factor one as 'mostly explicit knowledge', while to factor two as 'mostly tacit knowledge'. The factor loadings for 'learning new skills" appeared in both factors. The respondents indicated there was a tacit element in skills learned abroad.

Table 1. Factor analysis

	Returnees		**Current migrants**		**Total**	
Factor	**1:** 46.57%	**2:** 26.12%	**1:** 44.50%	**2:** 32.49%	**1:** 46.55%	**2:** 26.88%
Self-confidence	**0.864**	0.175	**0.827**	0.259	**0.860**	0.198
Learning to adapt to new cultures	**0.846**	0.139	**0.825**	0.324	**0.844**	0.157
Ability to deal with new challenges	**0.763**	0.362	**0.794**	0.119	**0.749**	0.395
Learning a language	**0.694**	0.183	**0.655**	0.565	**0.714**	0.162
Acquiring formal qualifications	0.097	**0.930**	0.114	**0.926**	0.100	**0.930**
Learning new skills	0.511	**0.698**	0.483	**0.766**	0.511	**0.709**

Returnees: KMO Measure of Sampling Adequacy: 0.830; Approx. Chi-Square7782.012; Sig. 0.000**;** Current migrants: KMO Measure of Sampling Adequacy: 0.843; Approx. Chi-Square 2061.962; Sig. 0.000**;** Total sample: KMO Measure of Sampling Adequacy: 0.834; Approx. Chi-Square 9811.815; Sig. 0.000
Source: Authors' research

The non-parametric tests were applied to explore following research questions:

- What knowledge have migrants acquired via migration?
- Does the knowledge acquired differ according to socio-economic variables?
- Do migrants and returnees differ in assessing specific types of acquired knowledge?

The returnees evaluated their experience higher than current migrants for most items of skills and competences (Table 2) [2]. The current migrants evaluated their current experience, while the returnees referred to past one. The current experience was vivid and seemed important for current migrants. When evaluating past experience, returnees could use the post-rationalisation perspective.

The migration experience seems to have had much more lasting impact on female lives than male ones. The female returnees considered their experience abroad more important than (a) male returnees and (b) female current migrants. The differences between male and female returnees were most pronounced for acquisition of the culture and language-related human capital ('learning to adapt to new cultures' and 'learning a language'). Females also claimed to have benefited from personal skills, such as self-confidence and ability to deal with

[2] The population weights were applied to adjust of oversampling for selected sub-populations. The survey weight value for the respondents was computed for gender x age x education x urban-rural sub-population, at the highest spatial level of detail provided. All results for descriptive statistics and ANOVA are based on the weighted data.

new challenges. There is a robust evidence on significant gender gap in self-esteem. Males tend to report higher levels of self-esteem than females do (Bleidorn, Arslan, Denissen, Rentfrow, Gebauer, Potter and Gosling, 2016).

Migrants and returnees with higher education claimed to have benefited from their migration experience more than migrants / returnees with secondary education. The people with primary education claimed lower benefits from migration than people with secondary education. Current migrants with primary education, however, significantly benefited from learning foreign language. Unlike migrants with higher education, migrants with primary education probably had limited knowledge of foreign languages before migration.

The sample was collected in nine European countries. The north of Europe was represented by the Germany (DE), Ireland (IE), Sweden, (SE), and the United Kingdom (UK). The north[3] accounted for the highest living standards and the lowest youth unemployment rates. Spain (ES) and Italy (IT) represented the south of Europe. The south accounted for the high living standards, but had the highest youth unemployment rates in the EU. Latvia (LV), Romania (RO) and Slovakia (SK) represented countries from the EU's eastern enlargement. The east accounted for the medium-high living standards and medium-high youth unemployment rates. The highest shares of the tertiary graduates were found in the south (40.6%) and north (36.0%) samples, while the lowest ones in the east one (20.7%). Some 12.8% migrants from the east reported primary education only. The north and south samples had fairly low shares of migrants with primary education (5.7% and 5.3% respectively). Educational structure of the migrants may explain some regional differences in acquisition of the human capital. The current migrants from the east, for example, highly appreciated opportunity to learn a new language. The university-educated migrants from the north and south likely spoke foreign language before migration. Some regional differences in acquisition of the human capital, however, must have been informed by other factors than education. The current migrants from the south and east, for example, reported the highest gains from migration in terms of increased self-confidence and adaptations to new culture.

[3] The labels 'north', 'south' and 'east' are illustrative for the respective parts of the EU. The survey was representative for young population of nine European countries (representing 58% of total European population aged 16-35). We, however, make no claims to have representative data for the above-mentioned three regions.

Table 2. Self-assessment of human capital acquired via migration by returnees and current migrants, European migrants

	Gender		**Education**			**region of origin**		
	female	*male*	*primary*	*secondary*	*higher*	*North*	*South*	*East*
Returnees								
Acquiring formal qualifications (embrained)	3.30	3.28	2.75	3.11	3.59*	3.29	3.51	3.07*
Learning new skills (embrained/embedded)	4.06	3.92*	3.48	3.88	4.19*	3.96	4.18	3.85*
Ability to deal with new challenges (embodied)	4.36	4.08*	3.77	4.17	4.33*	4.17	4.34	4.16*
Self-confidence (embodied)	4.28	4.06*	3.84	4.11	4.28*	4.08	4.31	4.15*
Learning a language (encultured)	4.13	3.85*	3.84	3.90	4.09*	3.77	4.32	3.97*
Learning to adapt to new cultures (encultured)	4.21	3.90*	3.81	3.93	4.21*	4.06	4.27	3.84*
N	*1606*	*1644*	*223*	*1663*	*1365*	*1428*	*944*	*879*
Current migrants								
Acquiring formal qualifications (embrained)	3.54	3.49	3.70	3.36	3.72*	3.54	3.71	3.38
Learning new skills (embrained/embedded)	3.97	3.89	3.63	3.85	4.14*	3.85	3.98	4.05
Ability to deal with new challenges (embodied)	4.14	3.98	3.88	4.06	4.21*	3.98	4.17	4.18
Self-confidence (embodied)	4.12	3.95	3.80	4.03	4.20*	3.92	4.12	4.22*
Learning a language (encultured)	3.82	3.90	4.00	3.98	3.73*	3.56	3.96	4.21*
Learning to adapt to new cultures (encultured))	4.09	3.94*	3.63	4.00	4.16*	3.90	4.21	4.13*
N	*567*	*382*	*55*	*534*	*360*	*519*	*166*	*263*

*Significant on 0.05 level. Mann-Whitney U-test for gender, Kruskal-Wallis test for education and region of origin.
Source: Authors' research

The ANOVA procedure was applied to examine (i) significant differences between groups (gender, education and region of origin) in their acquisition of human capital, and (ii) effect size. The effect size is measured via the partial eta squared (PES) statistics. The PES values indicate the percentage of variance in the dependent variable attributable to a particular independent variable.

Results of the ANOVA (Table 3) indicate that education had the largest impact on acquisition of human capital by the returnees. Acquisition of new skills,

improved ability to deal with new challenges and increased self-confidence generated the highest PES values (0.034, 0.023 and 0.018 respectively) in the returnee sample and 0.018, 0.011 and 0.020 in the current migrant sample. 'Acquiring formal qualification' also accounted for high PES values (0.025) in the sample of returnees. People with tertiary education claimed the highest improvement in the abovementioned skills.

Gender was significant factor of the competence acquisition. Females considered their experience abroad more important than males. The effect of region of origin seemed important. The learning language generated the highest PES values (0.012 respectively in the returnee sample and 0.029 in the current migrant sample). Current migrant from the East and returnees from the South claimed the highest improvements in language skills.

The interaction terms help to understand combined contribution of independent variables to the total variance in dependent variables. Combined influence of (i) education and region of origin on acquiring formal qualification and learning new skills, and (ii) education and gender on increased self-confidence generated the highest PES values in the sample of returnees. In the current migrant sample, the highest PES values for interaction terms were found for combined influence of (i) gender and region of origin on acquiring formal qualification, and (ii) education and gender on acquisition of total human capital.

The ANOVA results confirm findings reported in Table 2. The results suggest that returnees with tertiary education were able to improve their embrained/embedded knowledge (acquisition of formal qualifications and new skills) more than other subgroups. As for the embodied knowledge (self-confidence and ability to do deal with challenges) female returnees were main beneficiaries. The southern returnees evaluated the encultured knowledge most positively compared to returnees from other regions.

Table 3. The ANOVA model

		Corrected Model	**Intercept**	**Gender**	**Education**	**Region**	**Gender * Education**	**Gender * region**	**Education * region**	**Gender * Education * region**
Returnees										
Acquiring formal qualifications	Sig.	**0.000**	**0.000**	0.811	**0.000**	0.336	0.557	**0.005**	**0.000**	**0.000**
	PES	0.066	0.654	0.000	0.025	0.001	0.000	0.003	0.012	0.007
Learning	Sig.	**0.000**	**0.000**	**0.041**	**0.000**	**0.008**	**0.000**	0.718	**0.000**	0.192

new skills	PES	0.070	0.811	0.001	0.034	0.003	0.005	0.000	0.021	0.002
Ability to deal with new challenges	Sig.	**0.000**	**0.000**	0.794	**0.000**	**0.029**	**0.000**	0.534	**0.000**	0.072
	PES	0.062	0.863	0.000	0.023	0.002	0.009	0.000	0.007	0.002
Learning a language	Sig.	**0.000**	**0.000**	**0.002**	**0.000**	**0.000**	0.221	**0.003**	**0.006**	**0.040**
	PES	0.063	0.787	0.003	0.006	0.012	0.001	0.003	0.004	0.003
Self-confidence	Sig.	**0.000**	**0.000**	**0.023**	**0.000**	**0.001**	**0.000**	0.740	0.565	0.144
	PES	0.054	0.857	0.002	0.018	0.004	0.012	0.000	0.001	0.002
Learning to adapt to new cultures	Sig.	**0.000**	**0.000**	0.826	**0.000**	**0.000**	**0.000**	0.997	0.239	0.155
	PES	0.067	0.829	0.000	0.010	0.005	0.009	0.000	0.002	0.002
N				3251	3251	3251				
Current migrants										
Acquiring formal qualifications	Sig.	**0.000**	**0.000**	0.149	0.087	**0.018**	**0.012**	**0.001**	0.180	0.606
	PES	0.065	0.772	0.003	0.007	0.012	0.013	0.020	0.007	0.003
Learning new skills	Sig.	**0.000**	**0.000**	**0.036**	**0.003**	**0.050**	**0.000**	0.148	0.175	0.294
	PES	0.061	0.839	0.007	0.018	0.009	0.024	0.006	0.008	0.006
Ability to deal with new challenges	Sig.	**0.000**	**0.000**	**0.000**	**0.031**	**0.019**	**0.000**	0.154	0.530	0.595
	PES	0.099	0.874	0.034	0.011	0.012	0.058	0.006	0.003	0.003
Learning a language	Sig.	**0.000**	**0.000**	0.058	0.791	**0.000**	**0.003**	0.825	0.366	0.073
	PES	0.091	0.797	0.006	0.001	0.029	0.017	0.001	0.005	0.011
Self-confidence	Sig.	**0.000**	**0.000**	**0.000**	**0.001**	**0.008**	**0.000**	0.719	0.358	0.208
	PES	0.077	0.864	0.029	0.020	0.015	0.036	0.001	0.005	0.007
Learning to adapt to new cultures	Sig.	**0.002**	**0.000**	**0.005**	**0.038**	**0.000**	**0.031**	0.698	0.065	0.398
	PES	0.053	0.856	0.012	0.010	0.024	0.011	0.001	0.011	0.005
N				949	949	949				

Source: Authors' research

3. Conclusions

The quantitative part of the paper indicates that specific socio-demographic groups appreciate different types of knowledge acquired via migration. Migration seems to boost embrained / embedded knowledge in tertiary graduates and embodied knowledge in females. Life-cycle seems to affect way how the

knowledge acquired via migration is evaluated. Current migrants, for example, tend to value formal qualifications and ability to adapt to new cultures more than returnees. This is understandable given current circumstances of their life. Returnees consider their migration experience in a retrospective. They consider ability to deal with challenges and improved self-confidence the most valuable skills and competences acquired via migration. These skills and competences refer to tacit knowledge and can be built only via personal experience.

We also detected interesting differences in knowledge acquisition by European regions. Participants from the south and east of Europe generally indicated higher gains form international migration in terms tacit knowledge (self-confidence and ability to deal with challenges) than participants from the north. We assume, participants from the south and north had lower income and less experience with international travel and migration than participants from the north. Young people from the south and east of Europe therefore considered their new tacit knowledge more important the people from the north, who travelled more frequently in the past. The participants from the north, on the other hand, considered acquisition of explicit (embrained) knowledge the most valuable part of their migration experience.

Our research had some important limitations. Our sample included large numbers of participants for nine European countries. Our findings, however, cannot be generalised for all European countries. The large-scale survey is an expensive instrument. Financial constraints allowed for limited numbers of survey questions. We included some most important knowledge types into the survey, but the list of knowledge type cannot be comprehensive.

The future research may explore some other forms of tacit knowledge. There is some evidence that knowledge acquisition is impacted by personality type (Matzler, Renzl, Müller, Herting and Mooradian, 2008). There is an interesting opportunity to study, how acquisition of tacit versus explicit knowledge is shaped by diverse personality types.

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HOW PERCEPTIONS OF BANK FINANCING CONSTRAINTS DIFFER AMONG CHARACTERISTICS OF SMEs: EVIDENCE FROM TURKEY

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Abstract

The aim of this study is to identify and compare the differences based on various characteristics (such as size, legal structure and age) of SMEs and their perceptions of some problems related to accessing bank financing. The issues that could be perceived as obstacles by SME executives are high amounts of required collateral, high costs of credits and uncertainties in long term interest rates. In this regard, the research question can be formed as whether a firm' size, age and legal structure differ in terms of perceived bank credit obstacles. The data was collected by face-to-face surveys from one thousand Turkish SMEs in 2011 and 533 of them were investigated with regard to the specified purpose of this study. All of the firms were located in Ankara, Turkey, had gained credit from banks in last three years, and were members of Ankara Chamber of Commerce (ATO). P values from Chi Square and Z tests were used in order to analyze the sample, to find differences between selected factors and to show if the differences are statistically significant or not. The empirical results of the study demonstrate that perceptions of bank loan problems are reduced for older SMEs. However, the findings do not confirm dissimilarities between the different sizes and legal structures of enterprises with respect to their perceived level of bank credit obstacles. This might be the result of the similar effects of regulations of the Turkish government, Basel Committee and Turkish Banking Sector on these firms.

Keywords: Financial Constraints, Access to Bank Credit, SMEs, Turkey.

JEL Classification: G21, L26, O16.

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1. Introduction

The importance of SMEs increases worldwide due to their provision of new job opportunities, playing a key role in the economic growth of countries, and being easily adaptable to changes in business environment even during economic crisis. SMEs have limited size, limited capital power, limited markets and struggle to achieve diversification (Civelek et al., 2016b) and they can promote entrepreneurial and innovative operations (Erdogan, 2015). 90% of firms are SMEs around the world, and they supply more than 50% of the global workforce (IFC Issue Brief: SMEs, 2016).

According to European Commission's Annual Report of 2014/2015, SMEs create 67% of the workforce and the percentage of SMEs in non-financial sector is 99.8% in EU28 countries. As for Turkey, the rate of SMEs is more than 99% (EC, 2015) and 79% of workforce is provided by these firms (World Bank, 2011). These numbers serve as convincing evidence that SMEs are the backbone of developed and developing economies including Turkey. Although Turkish SMEs have significantly-positive characteristics with regard to job creation and the size of their sector in Turkish economy, they are not immune to difficulties especially to gain access to finance. This can be the result of having fragile economy and facing with several global financial crises in the last decade for Turkey.

In relation with difficulties experienced by SMEs in accessing bank financing, previous studies focused on obstacles, such as the amount of required collateral (Rahman et al., 2016b; Rahman et al., 2016c; Wangmo, 2015), the high cost of bank transaction fees (Ardic et al., 2012), and high interest rates (Abdesamed and Abd Wahab, 2014; Yildirim et al., 2013). Regardless of extensive empirical research around the world about financial constraints on SMEs, still financial difficulties experienced by SMEs are considered as one of the main barriers for SMEs to grow and sustain their businesses. In this regard, this paper examines whether or not these factors exist and could constraint SMEs to access to finance in Turkey.

The purpose of this study is to identify and define the dissimilarities between several sizes, legal structures and ages of firms in connection with the perception of various problems that firms could face when attempting to access bank financing, such as high levels of collateral required by banks, high credit expenses for firms and uncertainties in long term interest rates. This study focuses mainly on funding from banks, analyzes the firms that have received bank loans in the last three years and examines the problems separately. For these reasons, this study may have a significant contribution to the literature by providing better understanding of the similarities or differences of characteristics of firms in the scope of their perception of problems that they face to receive bank credits. By revealing the fact that most common issues could differ based

on some key characteristics of SMEs, this paper may help governments, institutions, banks and SMEs to find effective solutions to cope with these constraints in the process of funding. The rest of this paper is structured as follows: section one clarifies the theoretical literature in relation to the various characteristics of SMEs and identifies different obstacles that SMEs encounter when they attempt to receive funds from banks. The method, research methodology, and the characteristics of the data will be provided in section two. Section three presents a summary of the results while discussion section will be shown in section four. Limitations and recommendation of this paper will be briefly explained in the final part.

2. Statement of a problem

As it has already specified by many researchers in the literature, sector of SMEs plays a vital role especially in development of economies, in job creation and in market competition that enable to improve the level of GDP and also the quality of products (Belas and Sopkova, 2016; Belas et al., 2015). Civelek et al. (2016a) state that although SMEs face obstacles to reach capital markets, banks are essential players for the funding of SMEs. Some studies also posit that the primary source of external funding for SME financing is bank credit (Dong and Men, 2014; Wangmo, 2015). However, process of gaining bank financing is not easy for SMEs, so they encounter various limitations because of the enforcement of banks and governments especially in developing countries. This is because banks in developing countries have lack of sufficient information about firms and also property rights and legal rules are not well-developed and well-defined (Le and Nguyen, 2009).

In relation with the amount of collateral that banks ask for, Yildirim et al. (2013) clarify that the amount of provided collateral by SMEs enables banks to protect themselves against the credit default problem. Banks are disposed to give credits for firms that have well-structured balance sheets, suitable assets to collateralize and favorable credit history (Abdesamet and Abd Wahab, 2014). Furthermore, collateral can reduce some problems such as moral hazard, asymmetric information and monitoring cost (Yildirim et al., 2013). In consideration of high costs of credits, Le and Nguyen (2009) present a reason that asymmetric information between businesses and banks causes an increase in the costs of credits for SMEs. Especially in developing countries, banks need to use well-developed monitoring methods to be informed from SMEs and firms can be exposed to pay the costs of these methods (Kon and Storey, 2003). With regard to the problem of interest rate, SMEs face with higher interest rates when they apply to bank credits (Ardic et al., 2012) because interest rate relies on the hazardousness of firms (Ogubazghi and Muturi, 2014). By charging higher interest rates to SMEs, banks put themselves under protection against the risk of non-repayment of credit (Wangmo, 2015). Moreover, the interest rates for bank loans usually fluctuate in developing countries due to not having stable market.

In this regard, entrepreneurs might be concerned about the uncertainties in long term loan rates so they can be discouraged to apply for bank credits. Even though firms have already gained the loans, they can feel that banks might ask for higher interest rates during the payback period of their credits. This issue can be another obstacle that firms face to have loans from banks.

In the context of characteristics of firms, Fatoki and Odeyemi (2010) bear out that size, age and ownership structure have effects on receiving bank loans. Makler et al. (2013) also prove the existence of positive relationships between ages, sizes of firms and having reduced credit constraints. Furthermore, the authors result that compared with non-group affiliated firms, group affiliated companies can have lowered obstacles to accessing to finance. However, Erdogan (2015) finds that age, size, business group affiliation have no impact on to perceive credit access as a constraint. In the matter of size of firms, SMEs have reduced opportunities to access financing in comparison with large companies (Dursun, 2016). According to Beck et al. (2007), small and large businesses differ especially some of constraints of financing such as necessity of collateral, procedures of banks, payment of interest and insufficient knowledge about credit conditions. For instance, Makler et al. (2013) describe that large enterprises have more advantages to collateralize bank loans than small firms. This is because larger businesses are less likely to have opaque financial statements (Canton et al., 2013) and they are more likely to have higher level of assets (Rahman et al., 2016a) than smaller enterprises.

Corresponding to the age of a firm, Makler et al. (2013) infer that ages of businesses should be negatively related with funding obstacles. When businesses are more experienced, access to finance become easier for them (Berger and Udell, 1995). Because of having been operating for more years, SMEs might be more informed about banking instruments to apply for them (Le and Nguyen, 2009) and also they can provide sufficient assets to guarantee the required collateral by loan providers (Zarook et al., 2013). Kira (2013) and Yildirim et al. (2013) make it clear that the legal structures of firm effect obtaining financing. Owner of sole proprietorships is only one person that is obliged for all liabilities of a firm (Yildirim et al., 2013), whereas, corporate businesses have legal personalities that are under different tax liabilities, and they have income and assets separately (Harhoff et al., 1998). According to Cassar (2004), non-incorporated firms have less chance to gain bank loans than incorporated businesses.

As already noted elsewhere in this current study, high costs of credits, a high amount of collateral requirements and uncertainties in the long term interest rates are some of the vital problems that SMEs experience with accessing of bank financing. But these problems can be perceived differently by SMEs regarding to their legal structures, ages and sizes. In this regard, the study will be

pointed out why the perceptions of bank loan obstacles for Turkish SMEs might differ in relation to their characteristics.

3. Methods

The data was collected from SMEs located in ten different regions of Ankara, Turkey. By applying probability sampling method, a thousand firms were selected for the sample. The enterprises carry their businesses in different sectors such as, mining, construction, manufacturing, transportation, real estate, agriculture, service industry and financial services. The data was gathered from these enterprises by face to face surveys in 2011 and the respondents are owners, shareholders, managers of the firms and workers in department of accounting of these businesses. Moreover, the questionnaire was consisted of 23 enquiries and first ten questions were related with location, year of establishment, sector, basic products, percentage of sales (import, export), total net sales in the year of 2010, total assets in balance sheet, number of employees of firm and the title of the respondents. Other 13 questions were asked to the respondents regarding the problems and obstacles they have faced in bank financing process, and external sources they have used for financing.

66% of these firms are in micro segment and have workers lower than 10 people. The rest of businesses were classified under the segment of both Small and Medium-sized firms. Small enterprises have employees fewer than 50 (10-49) people whereas the number of worker for medium enterprises is between 50 and 250 (Turkish Official Gazette, Resmi Gazete, 2012). The data also consists of SMEs that have various legal structures namely, sole proprietorship, limited company and joint-stock company. The limited and joint stock companies were categorized under the name of incorporation. In relation with firm age, the enterprises were classified as "older" that operate for ten or more than ten years and "younger" that exist less than 10 years.

The structure of the sample with regard to sizes, legal structures and ages of the firms was as follows; 59% microenterprises (316 respondents), 41% small and medium sized enterprises (217 respondents); 40% sole proprietorship (213 respondents), 60% Limited and Joint Stock Company (320 respondents), 58% of firms (311 respondents) were established 10 and more than 10 years ago, 42% of enterprises (222 respondents) carry their businesses less than for 10 years. To analyze the problems that SMEs faced, 533 firms that used the bank credit in the last three years were chosen. In accordance with the objective of the study, three following bank credit problems were selected, "Banks ask for collateral that is higher than the requested credit by SMEs", "The costs of credits are expensive", "The uncertainties exist in long term interest rates" to identify the differences of firms' perceptions regarding ages, sizes and legal structures of businesses. These problems were evaluated by using five point Likert Scale (1-totally disagree, 2-disagree, 3-partially agree, 4-agree, 5-totally agree).

The answer of partially agree was eliminated due to the fact that is somewhat uncertain response for the analyses. The following three hypotheses were developed with regard to the purpose of the study;

H1: Statistically significant differences exist between sizes, legal structures and ages of firms and the statement that banks ask for collateral that is higher than the requested credit by firms. The study supposes that firms that are smaller, structured as a sole proprietorship and younger are more likely to agree with this statement than larger, incorporated and older enterprises.

H2: Statistically significant differences exist between sizes, legal structures and ages of firms and the fact that costs of credits are expensive. The study assumes that enterprises that are smaller, structured as a sole proprietorship and younger are more prone to agree with this issue than larger, incorporated and older businesses.

H3: Statistically significant differences exist between sizes, legal structures and ages of firms and the opinion that long term interest rates are uncertain. The study suggests that businesses that are smaller, structured as a sole proprietorship and younger are more agreed with this notion than larger, incorporated and older businesses.

By using Pearson statistics at 1% level of significance, the sample was analyzed and statistically significant differences and dependences were found between selected factors. P value that is lower than 5% significance level causes the rejection of the null hypothesis and the acceptance of alternative hypothesis. The null hypothesis suggests that no statistically significant relationship exists between the variables. The calculations were performed by using MS excel and a free statistical software that is available at http://www.socscistatistics.com/tests. By using Z score, statistically significant differences for individual replies were analyzed. The calculations were made by applying open source software that is available at: http://www.socscistatistics.com/tests/ztest/Default2.aspx.

4. Problem Solving

The results for the evaluation of dissimilarities between various characteristics of SMEs in the perception of the chosen bank loan problem were presented in table 1.

Table 1. Assessment of the Differences Among Sizes, Legal Structures and Ages of SMEs in the Perception of the Selected Statement

Banks ask for collateral that is higher than the requested credit by firms.	Total	Micro	SMEs	Sole Proprietor-ship	Incorpo-ration	Older than 10 years (10+)	Young-er than 10 years (10-)	p value Z-score M/SMEs SP/I 10+/10-
Completely agree and agree	406	209 66.14	140 (64.52	127 (59.62)	222 (69.38)	184 **(59.16)**	165 **(74.33)**	0.6965 0.0203 **0.0002**
Partially agree	71	58 (18.35)	39 (17.97)	48 (22.54)	49 (15.31)	66 (21.22)	31 (13.96)	0.9124 0.034 0.0323
Completely disagree and disagree	56	49 (15.51)	38 (17.51)	38 (17.84)	49 (15.31)	61 (19.62)	26 (11.71)	0.5418 0.4413 0.0151
Total:	533	316	217	213	320	311	222	
chí - square/		1.961		6.8037		**14.27**		
p-value		0.742		0.1466		**0.006**		

Source: Own calculation.

According to table 1, the results for P values from Chi Square suggest that significant differences exist between ages of firms with regard to the problem that "Banks ask for collateral that is higher than the requested credit by firms". In relation with firms' ages, the P value from Chi square illustrates that the result is significant at 1% significance level ($p<0.01$). The study finds that 165 (about 74%) out of 222 younger firms' respondents agree and totally agree with this bank loan problem. However, 184 (about 59 %) out of 311 older enterprises agree and totally agree with the same statement. On the other hand, the results do not find any significant differences between various sizes, legal structures of firms and their perceptions of the selected problem.

The P values from Chi Square are not significant at 1% confidence level for both sizes and legal structures of SMEs. The results from table 1 confirm that the study can partially accept the hypothesis 1, due to rejecting the fact that

perceptions of micro enterprises and firms that are structured as a sole proprietorship in relation with the chosen problem are increased more than Small and Medium-sized Enterprises and Incorporated firms.

Table 2. Assessment of the Differences Between Characteristics of Firms in the Perception of the Chosen Statement

Costs of credits are expensive.	Total	Micro	SMEs	Sole Proprietorship	Incorporation	Older than 10 years (10+)	Younger than 10 years (10-)	p value Z-score M/SMEs SP/I 10+/10-
Completely agree and agree	390	237 (75.00)	153 (70.51)	147 (69.01)	243 (75.94)	**207 (66.56)**	**183 (82.43)**	0.2501 0.0767 **0**
Partially agree	95	53 (16.77)	42 (19.35)	43 (20.19)	52 (16.25)	74 (23.79)	21 (9.46)	0.4472 0.2460 0
Completely disagree and disagree	48	26 (8.23)	22 (10.14)	23 (10.80)	25 (7.81)	30 (9.65)	18 (8.11)	0.4472 0.238 0.5418
Total:	533	316	217	213	320	311	222	
chí square/ p-value		3.1991 0.5250		8.1736 0.0854		**19.841 0.0005**		

Source: Own calculation.

Table 2 illustrates some of findings with regard to the assessment of differences between ages, sizes and legal structures of SMEs and their perceptions of the selected bank financing problem. Considering the problem that costs of credit are expensive, the p value from Chi Square is significant at 1% level for the length of doing business ($p<0.01$). This result confirms the existence of statistically significant differences between the firms that operate less than ten years and ten or more than ten years in relation to the specified constraint. It is shown in the table that 183 (about 82%) respondents from 222 younger enterprises agree and totally agree with the problem whereas about 67% of respondents in older firms agree and totally agree with the same fact. The P value from Z score (0.000) is also significant at 1% significance level and it demonstrates that younger businesses are in tendency to perceive the chosen fact as a problem when attempting to gain access to bank financing by comparison with older businesses. Hence, the results prove that statistically significant differences do not exist between various sizes and legal structures of SMEs with respect to the above mentioned problem. P values from both Chi Square and Z score are not significant at 1% significance level.

Hence, the findings from Table 2 suggest that microenterprises and SMEs and also firms structured with sole proprietorship and incorporation do not differ from each other to perceive the high costs of credits as a bank loan problem. There has been considerable argument to confirm the hypothesis 2 partially, because of not accepting the facts that SMEs and incorporated firms are less likely to perceive the chosen issue as a financing obstacle compared with smaller enterprises and the firms that are structured as a sole proprietorship.

Table 3. Assessment of the Dissimilarities Among Characteristics of Firms in the Perception of the Selected Fact.

The existence of uncertainities in long term interest rates.	Total	Micro	SMEs	Sole Proprie -torship	Incorpo -ration	Older than 10 years (10+)	Younger than 10 years (10-)	p value Z-score M/SMEs SP/I 10+/10-
Completely agree and agree	233	139 (43.99)	94 (43.32)	84 (39.44)	149 (46.56)	**121 (38.91)**	**112 (50.45)**	0.8807 0.1052 **0.0080**
Partially agree	129	67 (21.20)	62 (28.57)	52 (24.41)	77 (24.06)	86 (27.65)	43 (19.37)	0.0511 0.9282 0.0278
Completely disagree and disagree	171	110 (34.81)	61 (28.11)	77 (36.15)	94 (29.38)	104 (33.44)	67 (30.18)	0.1031 0.101 0.4295
Total:	533	316	217	213	320	311	222	
chí - square/ p-value		5.1918 0.2681		8.2826 0.0817		**13.993 0.0073**		

Source: Own calculation.

Table 3 demonstrates the results that are connected with the evaluation of differences between characteristics of SMEs in the perception of the selected issue. In consideration of the perception of the problem that "Interests rates are uncertain for future terms", Table 3 shows that no significant differences are in existence between small and larger enterprises and also sole proprietorship and incorporation. Both P values from Chi Square and Z score are not significant at 5% significance level. However, in relation with age of firms, the P value from Chi Square is significant at 1% level ($p<0.05$) hence the results support the existence of statistically significant differences between younger and older SMEs. Around 50% of 222 younger firms agree and totally agree with the chosen fact whereas the percentage of older enterprises is 39%. The P value from Z score is also significant at 1% significance level and confirms that the perceptions of younger businesses are increased with the selected bank loan problem in comparison with older enterprises.

Owing to the fact that, P values from Z score for both legal structure and size of firms are not significant, the hypothesis 3 can be partially accepted. By having no significant result in relation with sizes and legal structures of firms, the study cannot provide an explanation that the perceptions of the selected problem for larger enterprises and businesses that are structured as incorporation are reduced in comparison with smaller and non-incorporated firms.

According to the findings in relation with the ages of SMEs, significant differences exist between the perceptions of younger and older enterprises in relation with the bank loan problems. Moreover, the study proves that executives of younger Turkish SMEs are more agreed with the selected statements to perceive them as problems to gain bank finance than executives of older firms. In this context, the study has similar results with the study of Beck et al., (2006); Makler et al., (2013) and Canton et al, (2013). In the study of Beck et al. (2006), the scholars found that the perception of younger businesses for financial obstacles were increased compared with older firms. The results of Makler et al. (2013) also proved that older firms perceived reduced credit constraints in comparison with younger businesses. Canton et al. (2013) analyzed SMEs in the European Union and showed that the level of perceived bank loan constraints by younger firms was higher than older SMEs.

However, the results of the study in relation with dissimilarities between sizes and legal structures of businesses do not present any significant differences in the perceptions of the selected issues. Furthermore, the study also bears out the facts that the perceptions of the bank loan problems are not increased for micro enterprises and sole proprietorships by comparing with SMEs and incorporated firms. These results are not compatible with the studies of Beck (2007), Fatoki and Odeyemi (2010), and Makler et al. (2013) because these studies found that larger firms faced with reduced constraints in comparison with smaller firms.

With respect to the legal structures of firms, the findings of the present study have also similar results with the study of Beck et al. (2006). Beck et al. (2006) did not find any significant results that the level of perceived financial obstacles of a business group is reduced. On the other hand, the results of the current study do not have compatible results with the studies of Kira and He, (2012) and Kira, (2013). In their study, Kira and He (2012) stated that corporations and limited firms might gain easier access to finance than partnership and a sole proprietorship firm. In this context, Kira, (2013) also affirmed that the probabilities of facing with funding obstacles were higher for firms that were structured as sole proprietorship than incorporated SMEs. With regards to the contrast of the results of the study from other related studies, some arguments can be provided from the literature to support these findings. For instance, Berger and Udell, (2006) claimed that the legal, judicial and bankruptcy environments played an active role to influence credit availabilities by doing some important regulations. The researchers also clarified that different kinds of

taxes and regulations could provide advantages or disadvantages for SMEs to access credit. Therefore, implementation and enforcement of Turkish government, Basel Regulations and Banking sector in Turkish market may have same effects on different sizes and legal structures of firms to make them perceive these problems similarly. Moreover, Saeed and Sameer, (2015) enlightened that when bank concentration decreased, SMEs and large firms faced with reduced obstacles in the market. A large number of banks are in existence in Turkish banking sector so the competition between them might be increased. Hence, SMEs and large firms may encounter increased constraints in the market.

5. Discussion

Despite facing with bank loan obstacles is an unavoidable situation for SMEs across the globe, this fact can be reduced not only by convenient strategies, policies and enforcement of all policy makers such as governments, institutions and banks but also efforts of owners and executives of enterprises. Existences of incentives and subsidies of governments, developed institutions and legal systems in the economic environment also provide more opportunities to increase credit availabilities for SMEs. According to World Bank 2016 Doing Business Index, the strength of Turkish legal rights for getting credit is 3 on a 12 point scale, while the index for European and highly income countries are 6.4 and 6 respectively. Hence, Turkish government should improve the legal rules and bankruptcy laws for borrowers and apply effective implementations such as credit protection to reduce the obstacles of gaining loans.

Moreover, majority of banks in both developing and developed states perceive that guarantee programs are the most common and efficient way of encouraging and financing SMEs (Beck et al., 2008). However, in comparison with EU institutions, a firm's scale limit of Credit Guarantee Fund (KGF) in Turkey is few. Also the value of Guarantee of KGF is not so high in the banking system of Turkey and banks are not prone to give guarantees (Tunahan and Dizkirici, 2012). Therefore, Turkish government should make some regulations to solve these problems because these kinds of guarantee programs make contribution to improve relationship between banks and SMEs and the interest rates that banks charge to SMEs can be reduced (Posey and Reichert, 2011). According to Berger and Udell (1995), by having longer relationship with banks, firms face with less interest rates and lower collateral because banks can have more information about businesses, asymmetric information decreases between them so banks can provide better contract conditions. For these reasons, banks and enterprises should have close ties between each other to cope with lending constraints.

At last but not least, awareness of credit conditions, improvement in the size of the banking sector, and competitiveness in the market mitigate the obstacles to

access to bank credits for SMEs (Dong and Men, 2014). Considering to knowledge of credit conditions, Small and Medium Enterprises Development Organization (KOSGEB) plays a crucial role to inform entrepreneurs in Turkey. KOSGEB not only creates awareness for loan terms, but also provides support and improvement activities for SMEs. However, KOSGEB should not be the only option to educate entrepreneurs. In this regard, KOSGEB should collaborate with universities to increase the level of financial literacy in Turkey. Although some examples are in existence in various cities in Turkey, it should spread country-wide.

6. Conclusion

The objective of the present study was to identify and compare the differences between various sizes, ages and legal structures of SMEs in the perception of the selected bank financing problems. The investigated statements that could be perceived as problems by SMEs are the high amount of collateral that are asked by banks, the high costs of credits and the existence of uncertainties in long term interest rates. The data was collected in 2011 by face to face surveys with 533 SMEs that had received bank loans, located in different regions of Ankara in Turkey, were operated in various sectors and were the members of Ankara Chamber of Commerce.

The empirical results of the study confirm that younger SMEs perceive more difficulties in access to bank financing than older firms. On the other hand, the results of the study do not find any dissimilarity between different sizes and legal structures of businesses in respect to their perceptions of bank loan problems.

Although the study has significant results regarding differences and similarities between some characteristics of enterprises in the perceptions of bank credit constraints, the study has various limitations. The first limitation is that the study only focused on three facts that could be bank financing problems, therefore, other studies can look these issues from a broad perspective and may include more statements. Moreover, the study only consider three characteristics of firms so some different characteristics such as locations, sectors of firms and characteristics of firms' executives can also be analyzed by future researches. Another significant limitation is that the data examined for this study just consists of information from SMEs in one of cities in Turkey. Thus, new studies can gain a data from various cities in a country or include different developing and developed countries to have a wider perspective.

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HAPPIER UPPER CLASSES? – DO THE INTRA-FIRM COMPENSATION GAP AND GENDER WAGE DISCRIMINATION EXIST: EVIDENCE FROM A CHINESE COMPANY UNDER A TWO-TIER FRONTIER MODEL[1]

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Abstract

We examine the intra-firm compensation gap and gender wage discrimination in a listed company in China. We argue that the difference in bargaining ability of different level of employee can bring intra-firm compensation gap and we know that gender wage discrimination does exist at the bottom levels of employee. The bottom levels of employee have less bargaining ability than the firm, then get negative net surplus on wage that shows the existence of wage discrimination. While the upper levels of employee have stronger bargaining ability than the firm and will get positive net surplus on wage, which proves that the intra-firm compensation do really exist and the firm will pay more for upper levels. For bottom levels, female has relatively less bargaining ability than male and gets less wage, showing the existence of gender wage discrimination. Upper levels have almost the same bargaining ability as the firm and can get small amount of positive net surplus and there is no gender wage discrimination.

Keywords: Two-tier frontier, Bargaining ability, Gender wage discrimination, Intra-firm compensation.

JEL Classification: D31, J24, J31.

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1. Introduction

Wage distribution efficiency is always in highlights of important issues as it affects not only the consumption in macroeconomics but decides the long-term growth. Also, distribution fairness is an important way to guarantee social welfare. It also is an important way to enhance initiative and effectiveness of employee and improve income distribution of the whole society. The distribution of wage shows the bargaining result of the firm and the employee as well as the efficiency and equity. Theoretically, in the labor market, the labor price, wage, is decided by two factors, supply and demand. The firm considers the factor endowment it faces and decides how much to spend on hiring while the employees consider their own endowment and decide how much they will accept for a certain job. Under the direction of the "invisible hand" in the labor market, the firm and employees reach an agreement in bargaining and the equilibrium wage is decided. However, the market arrangement inefficiency, information asymmetry and heterogeneity etc. make it hard to reach the market-clearing level. And it is hard to live without wage discrimination.

After four decades of reform and opening up, China has become the 2nd largest economy in the world and starts to concentrating on building an efficient market system. However, there is a long way to go to build a paradise for all. The injustice in distribution is still waiting to be brought down. Focusing on the bargaining ability of both firm and employees, we try to find out what is it that lead to the wage discrimination.

We believe that the labor market is not perfect. The wage distribution shows the real result after bargaining of firm and employees though bargaining ability that is decided by many factors as human capital endowments and others personal characteristics, while a large amount of studies have been discussing this problem. Machin (1997) found that the labor agency plays an important part in workers' income equity by the survey of British employment and unemployment during 1980-1990, which suggested that the fainted union power or the failure of minimum wage intensify the inequity of wage distribution. Martins and Pereira (2004) found that the higher education level and better quality of schooling and major had a positive effect on wage. Using quantile regression, Arulampalam and Booth (2010) studied the relationship between education level and income distribution in private enterprises in 10 EU countries and found in a certain country, there was no strong relationship between job training and wage distribution but in different countries it showed a strong relationship between job training and wage distribution. We find that the difference in endowment plays an important role in wage distribution so we will introduce variables that describe the endowments of employees into our model.

As we all know, the upper classes of employee enjoy quite a high level of income that shows they capture stronger bargaining ability than the firm and will

get large surplus. However, whether the upper classes should get more is still controversial, a number of studies worked on the reason why the upper class of employees could get net positive surplus and the effect that it bought to the firm management. Early literatures believed that the higher wage level could ensure larger firm value. Coughlan Schmidt (1985) said higher wage for manager was an incentive to work hard to improve firm value and was good for the increase of shareholder value. After the study of 153 randomly selected manufacturing corporations, Mehran (1995) found it could raise the incentive of manager to improve firm value by offering more shareholdings than offering high wage. Chung and Pruitt (1996) discovered the inner relationship among the executive shareholding, firm value and executive income, that gave the executive high income and large shareholding could help improving firm value. They also found that the firm scale and the experience of executive did affect the wage level. After the financial crisis, an increasing number of scholars doubted the positive relationship between the executive wage level and firm value. Bebchuk and Cohen (2010) studied the compensation management of Bear Stearns and Lehman Brothers and found the high compensation might not have a positive effect on company management, but increased the executive risk-taking behaviors instead, which would bring financial crisis. Bolton and Mehran (2011) had come to a similar conclusion by studying the compensation management of some financial institutions. They believed that the shareholding as an incentive could increase the executive risk-taking behaviors. By using the representative small businesses data during 1993-2003, Cole and Mehran (2016) found that the executive compensation level had positive relation with firm scale and their age, education, background and gender.

Gender wage discrimination is always in highlight of academia. Female has less bargaining ability than male in labor market and always gets lower wage than male for the same work. By early year data of Russia, Newell and Reilly (1996) found about 30% of the wage differential came from gender. Jurajda (2003) studied the gender wage differential in transition countries and found by all the series of policies to fight against gender wage discrimination, two-thirds of the wage differential was attributed by gender, but public sector and state-owned enterprises were excepted. Oostendorp (2009) worked on data from International Labor Organization aiming at the influence of global factor on gender wage differential and found gender wage differential decreased with the economic development level, scale of foreign trade and investment. From the view of individual character diversity, Nyhus and Pons (2012) found 11.5% of gender wage differential came from individual character diversity. Mussida and Picchio (2014) used the ECHP panel data from 1994-2001 to study the influence of education on gender wage differential and found female with less education was easier to encounter with wage unfairness. Magnusson (2015) took doctors as a case to analysis the high-reputed careers and found gender wage differential still existed as the female doctors got lower wage than the male. By empirical

studies, Shouwei Qi and Zhiqiang Liu (2009) compared the gender wage differential in state-owned departments and non-state-owned departments and found the main reason of gender wage differential was gender discrimination while the discrimination in state-owned departments were more serious. Fengming Guo and Shiwei Zhang (2010) got similar result like Qi and Liu. Yuhao Ge and Xiangquan Zeng (2011) found two reasons to explain gender wage differential. On one hand, the firm had monopoly and so did the information asymmetry exist in the labor market, which allow the firm offered lower wage to female. On the other hand, the gender discrimination did really exist.

Besides the reason of gender wage differential, an increasing number of researchers start to work on the degree of gender wage differential under certain income level. Comparing the gender wage differential in the US and Denmark, Nabanita Datta Gupta et al. (2005) found, with the increase in income, the gender wage differential became large in Denmark which showed the ceiling effect. But the opposite phenomenon was found in the US. Using the ECHP panel data to test ceiling effect in wage distribution, Arulampalam and Booth (2007) found gender wage differential was significant in both state-owned and non-state-owned department. And at the upper class, the wage difference of female and male became more significant. After investigation and analysis about the wage distribution of 1.1 million employees in Sweden, Bihagen and Ohls (2007) found the floor effect that the lower class faced large wage discrimination while the upper class faced no obvious discrimination. Using quantile regression to analysis the wage discrimination in state-owned and non-state-owned enterprises, Shouwei Qi and Zhiqiang Liu (2009) found the floor effect existed in both lower and upper class while the lower class was faced with a big gender wage differential. By the analysis of urban worker gender wage differential, Shi Li et al. (2014) found the female employee who was inadequate and in bad condition would face more serious wage discrimination.

Throughout all the literature on wage distribution and gender wage discrimination, numbers of scholar have been working on the reason and effect of wage differential, but obstacles like the limitation of data and the lack of proper model make it hard to come to a certain conclusion. Because of the heterogeneity of subjects and bad data quality, like lack of real microcosmic data of firm and employee, empirical results and conclusions contradicted each other. At the same time, many scholars concentrated on the difference among firms, countries and cultures but the difference in different classes within a firm was still waiting to be explored. As we know, different classes of employee have quite huge gulf in endowments like education, experience, skills, etc., this paper is trying to find out the income distribution caused by the bargaining ability in different classes in one firm, and to reveal the reason of intra-firm compensation

gap and the influence of gender on bargaining ability in certain class of employee and find evidence for the gender wage discrimination.

The rest of paper is organized as follows: Section 2 builds up the bargaining model for both firm and employee. Section 3 describes the data and the empirical results. We conclude in Section 4.

2. The Bargaining model

2.1 Set up the mathematical model

Neoclassical theory believes that the firm pays at the equilibrium price of labor market and the market clears at the point where demand meets supply, at which maximizes both the firm and employee utilities. For the firm, the lower labor price it pays, the less operating cost it suffers and higher profit it gains. For employees, the higher labor price is, the more they earn. So, we consider the real wage point, which shows bargaining result of the firm and the employee. Also, we can take the real wage as an implementation of bargaining ability of both sides. Based on the argument above, we can describe the real wage (w) as follow:

$$w = \underline{w} + \eta(\overline{w} - \underline{w}) \quad (1)$$

where $\underline{w}$ is the lowest wage employee can accept, $\underline{w}$ is the highest wage the firm is willing to offer, η $(0 \le \eta \le 1)$ is the bargaining strength within the firm and employee, $\eta(\overline{w} - \underline{w})$ is the bargaining surplus firm gets. Future, we define $g(x)$ as the market clearing wage of employee who characterized as x, and $\underline{w} \le g(x) \le \overline{w}$. So, $(\overline{w} - g(x))$ is the largest surplus the firm can get. Correspondingly, $(g(x) - \underline{w})$ is the largest surplus employee can get. Finally, the surplus firm or employee gets depends on the bargaining ability firm and employee have. Then, we transform formula (1) into:

$$w = g(x) + \underline{w} - g(x) + \eta(\overline{w} - g(x)) - \eta(\underline{w} - g(x))$$

$$= g(x) + \eta(\overline{w} - g(x)) - (1 - \eta)(g(x) - \underline{w}) \quad (2)$$

Formula (2) can be divided into 3 parts, $g(x)$is the market clearing wage characterized by individual factor x, $\eta(\overline{w} - g(x))$ is the real bargaining surplus the firm get, and $(1 - \eta)(g(x) - \underline{w})$ is the real bargaining surplus of the employee, and $\eta(\overline{w} - g(x)) - (1 - \eta)(g(x) - \underline{w})$ is the net surplus represents the result of bargaining.

We can see from the above formula that the firm has the negative affect and turns to lower the wage while the employee has positive affect and tries to raise

the wage, and these two effects are both one-sided effect. We follow the two-tier frontier model of Kumbhakar and Parmeter (2009), and describe the bargaining action of the firm and the employee as follow:

$$y_i = \mathrm{g}(x_i) + \varepsilon_i \ , \varepsilon_i = v_i - \mu_i + \omega_i \quad (3)$$

y_i is the real wage after bargaining, $\mathrm{g}(x_i) = x_i'\beta$ is the equilibrium wage which stands for the market clearing price under certain individual characteristic. β is the corresponding parameter vector, x_i is the characteristic vector of employee. v_i is the residual error term, $\mu_i \geq 0$ and $\omega_i \geq 0$ stand for the non-negative random error terms with one-sided effect. μ_i represents the firm's bargaining ability which brings the firm more surplus by lowering the wage. ω_i represents the employee's bargaining ability which brings the employee surplus by raising the wage. Since μ_i and ω_i are both one-sided, E(ε_i) may not be zero and the OLS estimator of the parameters would be unbiased. So, we estimate the model using the maximum likelihood (MLE) method based on the following distributional assumptions of the error components. Following the work of Kumbhakar and Parmeter (2009), Hongyou Lu and Yujun Lian (2011) and Chunking Li et.al (2014), we assume that: $v_i \sim i.i.d.N(0, \sigma^2)$, μ_i and ω_i have the single-tier stochastic frontier and follow exponential distribution, viz., $\mu_i \sim i.i.d.Exp(\sigma_u, \sigma_u^2)$, $\omega_i \sim i.i.d.Exp(\sigma_\omega, \sigma_\omega^2)$.

And the 3 error components are distributed independently with each other and from the regressor, $\mathrm{x_i}$.

Based on the distributional assumptions above, the probability density function of ε_i is as follow:

$$\mathrm{f}(\varepsilon_\mathrm{i}) = \frac{\exp(\mathrm{a_i})}{\sigma_\mathrm{u}+\sigma_\omega}\Phi(\mathrm{c_i}) + \frac{\exp(\mathrm{b_i})}{\sigma_\mathrm{u}+\sigma_\omega}\int_{-\mathrm{d_i}}^{+\infty}\phi(\mathrm{z})\mathrm{dz} = \frac{\exp(\mathrm{a_i})}{\sigma_\mathrm{u}+\sigma_\omega}\Phi(\mathrm{c_i}) + \frac{\exp(\mathrm{b_i})}{\sigma_\mathrm{u}+\sigma_\omega}\phi(\mathrm{d_i}) \quad (4)$$

where $\phi(\cdot)$ and $\Phi(\cdot)$ are the probability density function and cumulative distribution function of standardized normal distribution. a_i、b_i、c_i、d_i is defined as follow, respectively:

$$a_i = \frac{\varepsilon_i}{\sigma_i} + \frac{\sigma_v^2}{2\sigma_u^2} \quad ; \quad b_i = -\frac{\varepsilon_i}{\sigma_\omega} + \frac{\sigma_v^2}{2\sigma_\omega^2} \quad ; \quad c_i = -\frac{\varepsilon_i}{\sigma_v} - \frac{\sigma_v}{\sigma_u} \quad ; d_i = \frac{\varepsilon_i}{\sigma_i} - \frac{\sigma_v}{\sigma_\omega} \quad (5)$$

The log likelihood function for observations can be set up as:

$$lnL(x_i;\theta) = -ln(\sigma_u + \sigma_\omega) + \sum_{i=1}^{n} ln\left[exp(a_i)\,\Phi(c_i) + exp(b_i)\,\Phi(d_i)\right] \quad (6)$$

where $\theta = \{\beta, \sigma_v, \sigma_u, \sigma_\omega\}$ is the estimated parameters, and all the parameters can be estimated by maximizing the above log likelihood function. We pay more attention to the bargaining ability of both firm side and employee side, in other

words, the surplus of each side. So we need the conditional distributions of one-sided error terms μ_i and ω_i as follow:

$$f(\mu_i|\varepsilon_i) = \frac{\lambda exp\,(-\lambda\mu_i)\Phi(\mu_i/\sigma_v+d_i)}{X_{1i}} \quad (7a)$$

$$f(\omega_i|\varepsilon_i) = \frac{\lambda exp\,(-\lambda\omega_i)\Phi(\omega_i/\sigma_v+c_i)}{X_{2i}} \quad (7b)$$

where $\lambda = (1/\sigma_u) + (1/\sigma_\omega)$, $X_{1i} = \Phi(d_i) + exp\,(a_i - b_i)\Phi(c_i)$, $X_{2i} = exp(b_i - a_i)\,X_{1i}$.

With (7a) and (7b), we derive the conditional expectation of μ_i and $\omega_i$as follow:

$$E(\mu_i|\varepsilon_i) = \frac{1}{\lambda} + \frac{exp(a_i-b_i)\sigma_v[\Phi(-c_i)+c_i\Phi(c_i)]}{X_{1i}} \quad (8a)$$

$$E(\omega_i|\varepsilon_i) = \frac{1}{\lambda} + \frac{\sigma_v[\Phi(-d_i)+d_i\Phi(d_i)]}{X_{2i}} \quad (8b)$$

By (8a) and (8b) we can get the absolute variation of the degree which shows the distance where real wage is from the market clearing wage. We divide the employee into upper class and lower class, which, by using the absolute variation, may impose limits on our analysis as the absolute value of individual characters varied. Instead, we use relative variation, which has a better analysis effect, defined as follow:

$$E(1 - e^{-\mu_i}|\varepsilon_i) = 1 - \frac{\lambda}{1+\lambda}\frac{1}{X_{1i}}[\Phi(d_i) + exp(a_i - b_i) * exp\,(\frac{\sigma_v^2}{2} - \sigma_v c_i)\Phi(c_i - \sigma v] \quad (9a)$$

$$E(1 - e^{-\omega_i}|\varepsilon_i) = 1 - \frac{\lambda}{1+\lambda}\frac{1}{X_{2i}}[\Phi(c_i) + exp(b_i - a_i) * exp\,(\frac{\sigma_v^2}{2} - \sigma_v d_i)\Phi(d_i - \sigma v] \quad (9b)$$

Using (9a) and (9b), we can calculate the net surplus (NS) after bargaining, which means, employee holds an advantage due to bargaining ability if NS turns out to be positive, while the opposite is true if NS is negative. NS is given as follow:

$$NS = E(1 - e^{-\mu_i}|\varepsilon_i) - E(1 - e^{-\omega_i}|\varepsilon_i) \quad (10)$$

2.2 Set up the Empirical model

The difference in bargaining ability mainly comes in two ways. On the individual property side, we call it individual endowments. Compared with lower class, the employees in upper class are usually equipped with better education, better ability, abundant experience. Usually, the firm is willing to hire these kinds of employee even it has to pay more. On the social property side, we consider about the firm culture and working environment etc. Dependently, we choose the explanatory variables which are mainly from the individual and social property side of employee while considering the availability, viz., age gender, education etc. Considering the regional difference, we add a dummy variable, province, into the regression and build up the two-tier frontier model as follow:

$$\begin{aligned} Lnwage_i = \beta_0 + \beta_1 Lnage_i + \beta_2 Gender_i + \beta_3 Marriage_i + \beta_4 Edu_i \\ + \beta_5 Native_i + \beta_6 Seniority_i + \beta_7 Level_i + \beta_8 Punish_i \\ + \beta_9 Award_i + \beta_{10} Training_i + \sum Province + v_i - \mu_i + \omega_i \end{aligned}$$

where $Lnwage_i$, $Lnage_i$, $Gender_i$, $Marriage_i$, Edu_i, $Native_i$, $Seniority_i$, $Level_i$, $Punish_i$, $Award_i$, $Training_i$ represents log wage, log age, gender, marriage, education, whether native employee or not, working experience, rank of position, the number of punishment, the number of reward, the number of training, respectively. $\sum Province$ is the dummy variable which includes Guangdong, Guangxi, Yunnan, Guizhou, Hainan, Fujian, Shanxi, and we set Yunnan as the benchmark.

3. Data and Empirical results

3.1. Data and Variables

Our data is the original full copy data from the human resources management data base of a listed company in mainland China whose subsidiaries spread over several provinces. The data starts at 1996 and end at 2015. We take it as a typical case and consider it as a good representative. In order to improve the data quality, we do treatments as follow:

To classify the employees into upper and lower class, we put frontline worker, primary manager, primary professional staff, unskilled worker, back-man, workman etc. into the lower class, while put middle manager, senior manager, middle professional staff, senior professional staff, duty engineer, etc. into the upper class. To guarantee the sample representativeness we drop the data of whose age under 18, which is under the consider of the regulation of Labor Law. We drop the samples whose observed value is default or exceptional.

After the treatments above, we get 23815 observations, while the observation of lower class is 19384 and upper class is 4431.

When choosing dependent variable, we consider the wage grade rather than the observed wage. As the observed wage is quite a complicated matter which contain foundational wage, merit pay, post wage, etc. which is quite hard to be summed up directly, while the wage of lower class always depends on firm current performance which is characterized by the violent fluctuation and hard to get efficient statistics. The higher the wage grade is, the higher salary worker gets, and the umber of wage grade range from 40 to 56. At the same time, to make the data better to describe the reality, we assign specific amount to stand for the wage grade. We take the lowest grade 40 as the benchmark, assign it with the amount 3500 RMB and one grade higher, 500 RMB increases.

The outcome variable is log wage and the explanatory variable in the regression are: age, gender, education, seniority, level, the number of punishment, the number of reward, the number of training and dummy variables for marriage, whether native or not and province. Detailed as follow:

Age: considering about the regulation of Labor Law, we drop the simples of those who are under 18, and others take the actual value of age and then take the log of the value.

Gender: We assign male as 1, and assign female as 0.

Marriage: Marriage may have a positive influence on working, we use the dummy variable of marriage and assign married employee as 1, single employee as 0.

Education level: We assign the education level into 4 grades. Below high school level as grade 1, junior college as grade 2, undergraduate as grade 3, graduate as grade 4 and evaluate them as 1,2,3,4 respective.

Native: By matching the employee's working location and household register location (province level), we assign the same as native as 1, otherwise 0. For those sample without household register data, we use their house address (province level) instead.

Seniority: We calculate the number of year from the employee joined the company until the year 2015.

Level: Considering the tiered standard of the listed company, and rank the position as 7 grades and evaluate them.

The number of punishment, the number of reward and the number of training are all take the original data.

In order to reduce the heteroscedasticity, we take the log of wage level and age. All the variables name and sign we referred are displayed on table 1. We can see

from the table that the average of gender is 0.285 which means the firm has much more male employees; the average of education is 1.405 which means most of the employees are not well educated; the average of rank of position is 2.544 which means most of the employees are lower classes.

Table 1. Statistics description

Variable	Average	Maximum	Minimum	Standard Error
Lnwage	8.583	9.35	8.16	0.170
Lnage	3.505	4.32	2.89	0.236
Gender	0.825	1	0	0.380
Marriage	0.686	1	0	0.464
Edu	1.405	4	1	0.688
Native	0.877	1	0	0.328
Seniority	5.019	20	1	2.833
Level	2.544	7	1	1.453
Punish	0.011	5	0	0.130
Award	0.015	5	0	0.137
Training	13.78	129	0	16.75

Source: Human resources management data base from a certain listed company

3.2. Model estimation

We estimate the difference of bargaining ability among lower class and upper class to analyze the wage discrimination, the results are presented on Table 2 and regression is ran dividedly in different group of all employees, lower class and upper class, respectively. Model (1), model (3) and model (5) is estimated by the two-tier frontier model using MLE (maximum likelihood estimation), while mode (2), model (4) and model (6) are OLS (ordinary least squares). All the results get a high R^2, which confirms all the explanatory variables has a strong interpretability with wage. By comparing the results and t value of OLS and MLE, we find a strong consistency between two methods which confirms the method MLE we use won't lead to biased estimations. The results are almost significant at 1% level, with few exceptions, and the sign of explanatory variables are all in line with expectation. From table 2, the education level, rank, seniority, etc. have a significant positive influence on wage, regardless of upper or lower class. The well-educated, longtime working and highly rank employees get higher wage and have stronger bargaining ability. This result is consistent with the literatures. Notice that the gender has a significant positive influence on lower class but not on the upper class, which confirms the existence of gender wage discrimination appearance in lower class.

Table 2. Estimates of regression

Variable	**All employees**		**Lower class**		**Upper class**	
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model(5)**	**Model(6)**
Lnage	-0.015***	-0.015***	-0.029***	-0.041***	0.068***	0.067***
	(-5.515)	(-5.203)	(-12.068)	(-15.582)	(10.307)	(10.138)
Gender	0.061***	0.067***	0.06***	0.082***	-0.004	-0.003
	(40.301)	(48.405)	(47.772)	(65.881)	(-1.221)	(-0.914)
Marriage	0.004***	0.003**	-0.0003	0.001	0.001	0.001
	(2.715)	(2.409)	(-0.269)	(0.831)	(0.275)	(0.445)
Edu	0.035***	0.036***	0.017***	0.017***	0.022***	0.021***
	(37.169)	(39.877)	(20.885)	(18.652)	(14.354)	(14.131)
Native	-0.017***	-0.018***	-0.007***	-0.007***	-0.008***	-0.007***
	(-9.98)	(-10.808)	(-4.579)	(-4.026)	(-2.841)	(-2.776)
Seniority	0.003***	0.003***	0.002***	0.002***	0.005***	0.005***
	(14.883)	(12.609)	(13.021)	(11.127)	(11.814)	(11.76)
Level	0.085***	0.091***	0.066***	0.069***	0.101***	0.101***
	(155.697)	(214.783)	(156.942)	(163.157)	(86.627)	(90.177)
Punish	0.002	0.005	-0.003	0.001	-0.004	-0.004
	(0.659)	(1.177)	(-0.987)	(0.274)	(-0.676)	(-0.682)
Award	0.015***	0.013***	0.010***	0.006	0.027***	0.028***
	(4.028)	(3.524)	(3.014)	(1.556)	(4.742)	(4.803)
Training	-0.00026***	-0.00029***	0.00001	0.00005	-0.00044***	-0.00044***
	(-8.177)	(-8.562)	(0.702)	(1.588)	(-6.456)	(-6.523)
Province	–	–	–	–	–	–
Constant	8.332***	8.316***	8.440***	8.437***	8.115***	8.127***
	(876.656)	(832.54)	(1028.363)	(925.159)	(356.043)	(367.662)
σ_u	0.0479	–	0.0475	–	0.0176	–
σ_w	0.0511	–	0.0277	–	0.0280	–
σ_v	0.0374	–	0.0315	–	0.0632	–
N	23815	23815	19384	19384	4431	4431
Adj.R^2	–	0.787	–	0.691	–	0.784
ll	27184.46	–	26758.891	–	5417.275	–

*, ** and *** denote significance at 10, 5 and 1 percent levels, respectively.
t values are in parenthesis.
The results of Province are not display on table in consideration of table format.
Source: Human resources management data base from a certain listed company

We can see from the results that there is an obvious difference between the upper and lower class that may come from great difference in individual endowment, which encourages us to carry on the test with divided group. Our analyses below are all based on the results from model (3) and model (5).

3.3. Variance decomposition: Bargaining ability measurement

Using the two-tier frontier approach will give us deeper insight on the effect of bargaining on wage from both firm side and employee side. The surplus from bargaining is revealed by wage, while the firm wants better employee with lower

wage, showing the negative effect on wage, while the employee wants higher wage at the given individual endowment level, showing the positive effect on wage. The wrestle on wage is perfectly explained by variance decomposition.

From the estimation results of σ_u, σ_w and σ_v in table 2, we can calculate the results of bargaining ability of the firm and the employee in table 3.

Table 3. Variance decomposition of bargaining ability on both side

Variable	Expression	Lower	Upper
Total variance of stochastic term	$\sigma_{,,}^2+\sigma_{,,}^2+\sigma_{,,}^2$	0.004	0.0051
Share of bargaining ability in total	$(\sigma_{,,}^2+\sigma_{,,}^2)/(\sigma_{,,}^2+\sigma_{,,}^2+\sigma_{,,}^2)$	0.753	0.215
Share of firm in bargaining	$\sigma_{,,}^2/(\sigma_{,,}^2+\sigma_{,,}^2)$	0.747	0.284
Share of employee in bargaining	$\sigma_{,,}^2/(\sigma_{,,}^2+\sigma_{,,}^2)$	0.253	0.716

Source: Calculated by the results from table 2

We can see from the results in table 3, column 3, for the lower class, the employee' effect on wage is about 25.3% while the firm's effect on wage is about 74.7%, which means the firm has absolute advantage on wage bargaining and the bargaining significantly reduce the wage and discriminates the lower class. However, the upper class in column 4, is almost reverse, the employee' effect on wage is about 73.4% while the firm's effect on wage is about 26.6% which means the upper class has stronger bargaining ability than the firm and can ensure higher wage by efficient bargaining with the firm. The upper class usually receives more and is not afraid of discrimination. The intra-firm compensation gap does really exist!

3.4. Estimate the intra-firm gap of the wage

It seems that we are reading the Matthew's story. The upper class is happier than the lower class. They have stronger bargaining ability than the firm and never suffers from any discriminations. However, the lower class seems not lives in such a happy world and suffers a lot from the negative net surplus brought by the poor bargaining ability. There is a big gap between the upper and lower class. But, how many surpluses are exploited? We are now trying to find the details on surplus extraction using one-side estimation based on the $E(1-e^{-\mu_i}|\varepsilon_i)$ and $E(1-e^{-\omega_i}|\varepsilon_i)$ from (9a) and (9b), respectively. These formulas describe the the percentage change which the firm and the employee gets, relative to the average wage. The net surplus (NS) is from function (10). Results are showed on table 4.

Table 4. The net surplus from bargaining

	Variable	Average	Standard	P25	P50	P75
Lower class	Surplus of employee	2.69	1.61	1.79	2.06	3.19
	Surplus of firm	4.53	3.71	2.14	3.45	5.31
	NS	-1.83	4.58	-3.52	-1.39	1.05
Upper class	Surplus of employee	2.72	1.14	2	2.48	3.06
	Surplus of firm	1.73	0.45	1.43	1.61	1.92
	NS	0.99	1.5	0.08	0.87	1.63

Source: Calculated by the results from table 2

We can see from table 4: on average, lower class is able to raise wage from the average up to about 2.69%, while the firm lowers the wage down for about 4.53%. The result of bargaining ability, names, the net surplus, is negative -1.83%, which means lower the wage down from the average wage for 1.83%. For lower class, the employees have less bargaining ability than the firm. In reality, the lower class can only accept the wage decided by the firm and have disadvantages on income distribution, which means, there does really exist of wage discrimination on lower class. The last 3 columns in Table 4 shows the net surplus of upper and lower class at first quartile, second quartile and third quartile, respectively. Overall, we can see the lower class is in disadvantage, but on the third quartile we get 1.05% in net surplus which means the upper quartile in lower class can get positive net surplus, but just only for the upper quartile, which proofs that even in the lower class, the intra-firm compensation gap also exists. One possible story is that, because of the existence of asymmetric information, the upper 25% of the employees in lower class who have inadequate personal characteristics than expected, still get more than average wage they deserve at their characteristics level.

However, on average, the upper classes have stronger bargaining ability than the firm with the surplus of 2.72%, larger than the surplus of firm, 1.73%, and get a net positive surplus and raise their wage. Even at different quartiles of upper class, the net surplus is positive, which reveals the advantage of the upper class in bargaining and income distribution.

3.5. Estimate the effect of gender in wage distribution

The gender problem in wage distribution is always in highlight, we follow the formula (9a), (9b) and (10) to do the one-side estimation with dummy variable, gender, and get the the net surplus analysis of lower and upper class in table 5.

Table 5. The net surplus from bargaining under different gender

		Variable	Average	Standard	P25	P50 (%)	P75
Lower class	Female	Surplus of employee	2.91	2.24	1.72	2.19	3.18
		Surplus of firm	6.39	6.1	2.15	3.09	9.1
		NS	-3.48	7.26	-7.38	-0.9	1.03
	Male	Surplus of employee	2.64	1.43	1.83	2.04	3.19
		Surplus of firm	4.11	2.77	2.14	3.49	4.83
		NS	-1.47	3.64	-3	-1.44	1.05
Upper class	Female	Surplus of employee	2.63	0.83	2.11	2.48	3.04
		Surplus of firm	1.73	0.48	1.44	1.62	1.83
		NS	0.9	1.23	0.28	0.86	1.61
	Male	Surplus of employee	2.74	1.19	1.98	2.48	3.06
		Surplus of firm	1.73	0.45	1.43	1.61	1.94
		NS	1.01	1.54	0.03	0.87	1.63

Source: Calculated by the results from table 2

We can see from the table 5 that, on average, for the lower class, the female can raise the wage for 2.91% while the firm lowers the wage for 6.39%, the male can raise the wage for 2.64% while the firm lowers the wage for 4.11%. Even though, the net surplus for both female and male is negative, but the male can get more net surplus than the female, which tells the bargaining ability of male is stronger than female in lower class. The last 3 columns in table 5 show the net surplus for both male and female in different quartile. We can see a lower net surplus of female than male on average. But on the third quartile, the difference between male and female shrinks to 0.02%. By contrast, we also calculate the surplus of upper class. On average, the net surplus of female is 0.9% while the net surplus of male is 1.01%, and the difference on different quartile is just about to tell in upper class the gender has little influence on wage and the female and male has the similar bargaining ability and there is no gender wage discrimination exist in upper class. The result is consistent with the former result in table 2, that the gender variable is not significant in upper class model but significant in lower class.

4. Conclusions

We use the database of a certain listed company in mainland China and the two-tier frontier model to estimate the surplus from the bargaining of both firm and employee in different classes and also calculate the net surplus to explore the wage discrimination during this process. We find a strong evidence for intra-firm wage gap and gender wage discrimination. While, we also get some useful statements as follow:

The lower class has less bargaining ability than the firm and gets less wage than average level. By the results of variance decomposition, the lower class has an upside power of 0.253 while the firm has a downside power of 0.747, and the

lower class gets negative net surplus, which means they can not get all the wage they deserve and suffer from the wage discrimination.

The upper class of has stronger bargaining ability than the firm and gets more wage than the average level. By the results of variance decomposition, the upper class has an upside power of 0.716 while the firm's bargaining ability is about 0.284. The upper class makes the firm pays more for them and gets a positive net surplus.

The wage discrimination exists among the lower class rather than the upper class. For lower class, the female has less bargaining ability than the male, which shows the exist of gender wage discrimination. However, for the upper class the net surplus of both the female and male is indifference and they enjoy an equality in wage distribution.

Till now, we find some facts in wage distribution, that the intra-firm compensation gap does exist, the upper class can always get more than the lower class, which make the lower class suffers more. At the same time, the female in lower class experience the cruelest unfairness in wage distribution, which reveals the gender wage discrimination. There is still a long way to go in order to build a fair and efficient labor market.

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EFFECTS OF COMMODITY PRICE LEVELS AND VOLATILITY ON GROWTH IN A LEADING COMMODITY EXPORT FRAMEWORK

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Abstract

Evidence on the commodity curse is nowadays still under debate, with economists focusing on panel data applications in order to uncover the conditional relationship between prices and growth in large sets of countries. While there is much informal evidence to support the 'curse' hypothesis, time series analyses using the VAR methodology have found that increases in commodity prices significantly raise the growth of commodity exporters. In this paper, we adopt cointegration methodology in time series framework for a set of six commodity exporting countries, focusing on the price of their leading exported commodity and attempting to explore the relationship between commodity prices, GDP and growth in a sample covering the 1960-2011 period. After investigating the long run, accounting for a possible break in the series and in the cointegrating relationships, we proceed to analyze the effects of an innovation in GDP in response to price movements through an impulse response function analysis. Our results show evidence of a possible long run relationship between GDP, a set of relevant controls, and the selected commodity prices in three out of the six analyzed countries, conditional on the existence of a single structural break that we loosely identified as the beginning of a transition period to more democratic institutions in each of the analyzed countries. Shocks in the prices of the leading exported commodities we surveyed not only cause a positive response in short run growth, but induce a positive shift in the steady state level of GDP. Such results represent evidence that opposes the idea of the price channel as a medium of transmission of the commodity curse, both in the long and in the short run.

Keywords: Commodity prices, Cointegration, Exports, Growth.

JEL Classification: O11, F31

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1. Introduction

A branch of the literature related to economic growth suggests that countries endowed with abundant resources tend to grow at a slower pace than countries where resources are scarce:[1] among the main channels of transmission, theoretical literature has found out three possible channels. First, countries focused on commodity exports face a higher level of volatility than the other countries, due to their lack of specialization. Second, higher prices in the non-tradable economic sectors following the discovery (or the presence) of plentiful natural resources, would lead to the subsequent appreciation of the real exchange rate, causing external losses of competitiveness.[2] Finally, resources which are susceptible to rent seeking might be related to lower quality of the institutions.[3] The existence of a commodity curse, at least in the short run, remains highly debatable. Recent studies have shown how such phenomenon might indeed not constantly hold across resource-dependent countries. In an attempt to verify the first channel of transmission, Raddatz (2005) found out how external shocks, including price shocks, would only account for a small fraction of the volatility of GDP in a vector auto-regression (VAR) application for a selected panel of countries, while, understanding the limitations of the VAR approach and considering the feasibility of a joint short and long run study, most recent mainly focused on dynamic panel data applications in a cointegrating framework,[4] verifying whether or not positive/negative short run effects might be offset in the long run by adverse outcomes. Our study bridges short and long run analysis in a time-series cointegration framework for the 1960-2011 period, studying the effects of prices on growth in six different developing countries. The rest of this paper is organized as follows: in Section 2, a description of the methodology and the data. In Section 3 we report the results of the integration tests for the single series. In Section 4, we report the results of the cointegration tests. In Section 5, the relationships resulting from the past Sections are estimated and discussed. In Section 6, we comment the results of an Impulse response function (IRF) application studying the effects of an oil price shock on growth and long-run GDP. Finally, Section 7 concludes the paper.

[1] See Sachs and Werner (1997), Sachs and Werner (2001) and Sala-i Martin and Subra-manian (2013).

[2] This phenomenon, known as dutch disease, was first highlighted in an article in The Economist in 1977, and later modelled by Corden and Neary (1982) who explained how direct and indirect de-industrialization of less competitive manufacture sectors, following the discovery of new natural reserves, would led to higher price levels in the non-tradable sectors and to less competitive exports, which normally face internationally set prices.

[3] Mehlum, Moene, and Torvik (2006) build on Sachs and Warner works on the resource curse, finding out, contrary to what stated by the latter authors, that abundant resources cause a decrease in aggregate income when institutions are "grabber friendly", while "producer friendly" governments imply a positive relationship between resources and income.

[4] See for instance, Collier and Goderis (2008), Collier and Goderis (2012) and Cavalcanti, Mohaddes, and Raissi (2011), Cavalcanti, Mohaddes, and Raissi (2014). The latter authors in particular, show how both oil abundance would have a positive effect both on income level and economic growth, while volatility of terms of trade would have an overall negative e¤ect, thus disagreeing with Raddatz results in the short term.

2. Methodology and Data

Recent panel data applications have been fundamental in developing a more accurate analysis of the pattern of growth. However, determinants of long run growth across countries have generally been subject to the not always advisable restriction of a common long run behavior in the light of convergence theories.[5] In this paper, we exploited the selection methodology as in Bodart, Candelon, and Carpantier (2012) and Bodart, Candelon, and Carpantier (2015) to select a group of six developing countries based on the average export share of their leading commodity on the total value of exports. Our paper borrows their selection method to capture the relationship between commodity prices and growth by substituting weighted indexes with a commodity price variable for a set of relatively small developing countries. Weighted price indexes show an important drawback: they reflect not just changes in relative prices but also changes in the underlying weights in every country. Furthermore, the relationship be-tween an aggregate index and the analyzed economic variable will depend on the correlation between the prices in the index. This means that the true relationship between growth and prices might be altered by the way prices interact. An index with two perfectly negatively correlated prices would show no relation at all with growth or with any other given variable supposed to depend on it. A way to address the above issues is here presented by exploiting series made of single commodity prices.[6] Another important issue we had to consider was related to the availability of a sufficiently long sample period in yearly frequencies.[7] The majority of the variables we used in the analysis come from version 8.1 of Penn World Table. From this database we took a PPP based real GDP series, called RGDPe, and the total population expressed in millions of

[5] Of course, an heterogeneous estimation in panel data would be feasible, although subject to the degree of heterogeneity across the panel: see Eberhardt and Teal (2010) and Eberhardt and Presbitero (2013) for a few applications to panel estimation accounting for cross sectional correlation and slope heterogeneity based on the mean group estimators family.

[6] Our analysis focused on the idiosyncratic effects on GDP and growth of leading commodity prices movements. As such, an important caveat is that our paper does not currently borrows the convergence-testing strategy framework, based on the stochastic and common trend analysis of GDP seen in Bernanrd and Durlaf (1995) nor from the analysis of the cross sectional variance of the GDP as in Evans (1996). Whenever we refer to changes in the steady state of the economy, we thus refer to the changes of the equilibrium value of long-run GDP in a country by country analysis, without referring to the possibility of the countries examined to be part of a convergence or divergence club. The economies we examine in this paper are transition economies on their path to democratization, which are assumed to be still distant from their equilibrium values. This ultimately explains why, as we will see in the later sections, our estimation strategy had to resort to a subjective selection of the control variables for which we investigated the cointegration property.

[7] A corollary to convergence studies in growth regressions would normally involve some dynamics of output, as Islam (1995) explains in a panel growth context. This leads to the classic formulation of a "Barro" regression with Solowian controls. However, a common characteristic of studies estimating panel growth regressions has been using five or ten years averages to eliminate the possible e□ect of cyclical fluctuations on long run estimates (see Durlauf, Johnson, and Temple (2005), pag 113, for a brief discussion on the topic). The VECM methodology we employed in this work allowed to analyze both the short and long run effects of commodity prices on growth, and make use of all the possible available information without the need to take averages of the series.

units, pop, to calculate the per capital real GDP; a human capital variable, hc, based on Barro and Lee (2013) hours of schooling variable, and finally a measure of yearly investment and capital accumulation, csh_i. We had to resort to the World Bank's Databank to retrieve a measure of trade openness, tradeop, measured as the ratio between total export plus import volumes over GDP. Finally, the UNCTAD commodities database was used to retrieve the nominal price of Tobacco, Copper, Gold, Coffee, Cocoa, Bananas and Tea, which we deflated by the manufacture unit value index (MUV) in order to construct our series of real commodity prices. All the variables were expressed in logarithms. The countries we considered were selected conditional on the availability of data from the sources we mentioned above and the export weight of their leading exported commodity: due to current limitations in the series at our disposal, we avoided considering oil exporting countries, in particular Nigeria[8] but considered anyway two exporters of mineral commodities, Malawi and Zambia. Finally, out of the fourteen countries suggested by Bodart, Candelon, and Carpantier (2012), six were selected for our analysis: Burundi, Dominica, Ivory Coast, Kenya, Malawi, Mali and Zambia. The implicit long run relationship we thus attempted to estimate, conditional on the outcome of the unit root and the cointegration tests was:

$$RGDP_e = f(hc_t; csh_t; tradeop_t;\ comm_t) \quad (1)$$

Past literature has suggested a large number of possible "controls" in growth regressions. Correlations in the variables we have introduced above and growth has proven to be relatively high,[9] so that, apart from the expected endogeneity issue that would arise from an omitted variable bias, and given the limited amount of periods at our disposal, we choose not to extend this analysis introducing additional control variables. A discussion apart is related to the variables we defined as controls. Cointegration is not a widespread statistical property. Equilibrium variables in the cointegrating vectors might be present or not depending on their integration order, so that their usefulness will vary from country to country, even when eventual breaks in the cointegrating relationship

[8] A country which has already been extensively analyzed in Sala-i Martin and Subramanian (2013).

[9] We refer again to the seminal work of Barro (1991) and further developments by Barro and Lee (2013) on the relevance of a negative relationship between growth and initial GDP levels, and a positive relationship between growth and an initial enrollment indicator and overall years of schooling. The use of variable csh_i, the GDP share of gross fixed capital formation, was instead suggested by the work of Levine and Renelt (1992). As Sala-i Martin, Doppelhofer, and Miller (2004) point out after a Bayesian prior selection application, price of investment, primary school enrollment and initial GDP prove to be the most significant and robustly partially correlated variables with long term growth. Finally, the inclusion of the variable tradeop, measuring the degree of trade openness of a country, was motivated by the idea of controlling for the intensity of trade on prices. Even under a dutch disease hypothesis, where the trade open manufacture sector is a price taker, higher trade volumes might lead to a higher price level in the non-tradable sector and subsequent worsening of the resource curse.

are accounted for. This obviously makes the difference, especially in a vector error correction specification, where its main advantage compared to standard VAR analysis is the possibility of observing both long and short run relationships among variables, sometimes at the cost of direct interpretability of the magnitude of coefficients when just a few variables are left after the unit root analysis of the series. In Section 4, we present the results of the residual based and vector based cointegration tests. The residual based unit root tests we employed in the analysis were the Perron and Vogelsang (1992) unit root test with a single structural break for the variables in first differences and the Zivot and Andrews (1992) test for the levels.[10] To account for the issue of small sample bias, we analyzed the series in levels and first differences employing the corrected M-tests from Ng and Perron (2001). As a strategy for unit root testing, we followed the approach suggested by Dickey and Pantula (1987), starting from first differences and then analyzing levels, drawing our conclusion on the order of integration of the series based on the non-rejection of the null hypothesis. After checking for the order of integration of the variables, from which we drew the information we needed to give a structural form to the relationship in equation (1), we will move to Section 4, where we employed alternative specifications of the Gregory and Hansen (1996a) cointegration test to check for the existence of a long run equilibrium among the variables, retrieving in the meanwhile an endogenous break date for each country that we put to use again testing for cointegration in the error correction based approach by Johansen, Mosconi, and Nielsen (2000), based on the Johansen and Juselius (1990) methodologies. We present the results for the cointegrating relationship we obtained in Section 5[11] and discuss an IRF analysis of the relationships for the variables both in their first differences and levels in Section 6.

[10]The Perron and Vogelsang (1992) test was originally specified as a test with a level shift only, while the Zivot and Andrews (1992) allows for a break in the trend and the intercept as well as a break in the intercept only. For the sake of completeness, we present the latter test considering both possibilities. Furthermore, we are aware of the risk of data mining related to the search for a break date in time series. To avoid such critique, we restrict the analysis to testing for a single break only.

[11] The necessity to look for breaks in the variables we presented is essentially due to the changing nature of the economic structures of the economy. Trade openness during the past sixty years has changed substantially across emerging countries, and with it, the path of human capital might have been altered thanks to technological and social spill-over. Moreover, as seen in Christiano (1992) and the time path of GDP in the U.S. after the second world war, visual inspection of the data and pre-estimation selection of the break-date significantly alters the outcome of the analysis.

Table 1: Country selection and export weights

Code	Country	Commodity	Weight
BDI	Burundi	Coffee	51.0%
ICV	Ivory Coast	Cocoa	34.1%
KNY	Kenya	Tea	21.2%
MWI	Malawi	Tobacco	60%
MLI	Mali	Gold	54.1%
ZMB	Zambia	Copper	54.0%

Weights are defined as the ratio between the commodity exports of the country and all the commodity exports of the country. Out of the fourteen countries selected in Bodart, Candelon and Carpantier (2012) we choose those countries whose relative weights were higher than 20%, conditional on the availability of the data.

3. Unit Root Tests

This Section reviews the results on the unit root tests. Results for the Ng and Perron (2001) M-tests are reported in Tables 2 and 3. The additive and outlier models of the Perron and Vogelsang (1992) test for the series' first differences are reported in Tables 4 and 5. The Zivot and Andrews (1992) tests accounting for a break in both the intercept and the trend of the series and the trend only are reported in Tables 6 and 7. According to the Ng and Perron (2001) tests, the majority of the GDPs appear to be integrated of order one, exception made by Burundi's GDP. The same result applied to the Commodity prices, where all the commodities, with the exception of coffee, appear to be I(1). The human capital and the trade opening measure appeared to be I(1) in Burundi and Zambia only, while the gross fixed capital formation variable appear to be non-stationary only in Ivory Coast and Mali. Overall, the outcome of the M-tests did not point at the majority of the variables as suitable long run controls. However, to account for possible break stationarity, we decided to pair-up the M-tests with unit root tests accounting for the presence of one structural break. After the results showed in Tables 4 and 5, based on the first differences, the Zivot and Andrews (1992) tests admitted a much less restrictive set of I(1) variables, once the possibility of a structural break was accounted for. In order to select the variables to carry over to the cointegration tests, since both methodologies, the M-tests and the one break unit root tests, would not suggest a unique solution, we choose to accommodate both suggestions and selected the variable accordingly to both the type of tests we employed, conditional on the fact that the selected variable had been considered I(1) by at least by one of the tests. Our selection can be seen in Table 8.

4. Cointegration Tests

This Section reviews the results on the cointegration tests. Table 10 reports the results for the Gregory and Hansen (1996a) residual-based cointegration tests with one endogenous structural break,[12] Table 11 reports the results for the Johansen cointegration tests, while Table 12 shows the outcome of the Johansen, Mosconi, and Nielsen (2000) cointegration tests with a break in the trend and at a known point in time. We choose to report all model specifications from Gregory and Hansen (1996a), that is model C (a single break in the level of the cointegrating relationship, trend excluded), model C=S=T[13] (a contemporaneous break in the slope of the trend, the slope of the long run elasticity and the intercept), model C=S (a shift in the levels of the relationship and a change in slope of the long run elasticities) and model C=T (a level shift with a trend in the deterministic component). In our test strategy, we choose to compute the results for the Gregory and Hansen (1996a) tests first, so that the endogenous break dates found could be later used for the Johansen, Mosconi, and Nielsen (2000) tests, which require prior knowledge of the known break date. Results from the Gregory and Hansen (1996a) show that an equilibrium relationship could be found in Burundi across all specifications, while little evidence of a complete regime shift in the cointegrating relationship can be found in Mali, where the test for the C=S=T specification could reject the null hypothesis of no cointegration at the 5% level. As explained above, we took the break dates from the residual based tests[14] to compute the Johansen, Mosconi, and Nielsen (2000) tests with some prior knowledge of a possible break date. Results from this latter test, which can be seen in Table 12, confirm the specification for Burundi as being cointegrated, as the test trace statistic reports the presence of at most one cointegrating vector. As for Mali, the weak results in the residual based tests became even weaker evidence in Table 12, where the null hypothesis on no cointegrating relationship was rejected at all conventional levels of significance. For Zambia, non-rejection of the null of no cointegration in Table 10 was followed by non-rejection in the test with a break in Table 12, where the test the presence of at most two cointegrating relationships was detected. Lastly, we observe some weak evidence of cointegration in Ivory Coast in Table 11, which is however not supported by any of the other tests. In conclusion, we choose to estimate two alternative VECM models for Burundi, Zambia and Mali, one with

[12] For the sake of completeness and to compare the results, we also report, in table 9, the results for the Engle and Granger (1987) residual based cointegration tests, which does not account for structural breaks. We included two specifications, one with a constant and another with a constant and a trend. Critical values are taken from MacKinnon (2010).

[13] The C=S=T model was not present in Gregory and Hansen (1996a) but appears in Gregory and Hansen (1996b).

[14] We choose the C=T date for Burundi and the C=S=T break date for Mali, since this two specifications appeared to reject effortlessly the null hypothesis of no cointegration. As for the other countries, our choice fell on the C=T break date.

a specification accounting for the presence of a single break and one without any structural break.

Table 2: Ng and Perron (2001) tests, first differences

	Variable	Mz_a	MZ_t	MSB	MP_t
BDI	RGDP [e]	-0.78	-0.49	0.62	21.65
	hc	-9.57**	-2.09**	0.22*	2.95**
	tradeop	-11.29**	-2.37**	0.21**	2.19**
	comm	-17.98***	-2.94***	0.16***	1.56***
	csh_i	-32.40***	-4.02***	0.12***	0.76***
ICV	RGDP [e]	-27.52***	-3.69***	0.13***	0.92***
	hc	-4.78	-1.55	0.32	5.12
	tradeop	-4.38	-1.38	0.31	5.76
	comm	-12.94**	-2.48**	0.19**	2.14**
	csh_i	-31.93***	-3.99***	0.12***	0.77***
KNY	RGDP [e]	-11.50**	-2.38**	0.21**	2.21**
	hc	-2.16	-0.92	0.43	10.36
	tradeop	-36.36***	-4.23***	0.11***	0.76***
	comm	-2987.64***	-38.65***	0.01***	0.01***
	csh_i	-1.72	-0.80	0.47	12.38
MWI	RGDP [e]	-20.46***	-3.19***	0.16***	1.19***
	hc	-7.04*	-1.81*	0.26*	3.72*
	tradeop	-3.28	-1.27	0.39	7.46
	comm	-10.14**	-2.25**	0.22*	2.42**
	csh_i	-0.01	-0.01	0.39	14.57
MLI	RGDP [e]	-7.25*	-1.87*	0.26*	3.49*
	hc	-11.58**	-2.38**	0.21*	2.21*
	tradeop	-1.06	-0.72	0.68	23
	comm	-7.81*	-1.96*	0.25*	3.18*
	csh_i	-0.56**	-2.29**	0.22**	2.33**
ZMB	RGDP [e]	-7.43*	-1.93*	0.26*	3.31*
	hc	-451.94***	-15.02***	0.03***	0.07***
	tradeop	-56.74***	-5.32***	0.09***	0.44***
	comm	-16.29***	-2.85***	0.17***	1.54***
	csh_i	-3.89	-1.39	0.28	4.45

***Significant at 1%, **significant at 5%, *significant at 1%. The tests include an intercept in the deterministic component.

Table 3: Ng and Perron (2001) tests, levels

	Variable	Mz_a	MZ_t	MSB	MP_t
BDI	RGDP [e]	-3.36	-1.29	0.39	27.09
	hc	-12.40	-2.36	0.19	8.03
	tradeop	-8.89	-2.07	0.23	10.38
	comm	-14.53*	-3.42***	0.14***	6.66*
	csh_i	-8.25	-2.01	0.24	11.11
ICV	RGDP[e]	-5.08	-1.47	0.29	17.41
	hc	-9.35	-2.14	0.23	9.84
	tradeop	9.41	-2.16	0.23	9.7
	comm	-6.59	-1.77	0.27	13.85
	csh_i	-11.23	-2.34	0.21	8.24
KNY	RGDP[e]	-3.64	-1.32	0.36	24.59
	hc	-354020***	-420.73***	0.001***	0.0003***
	tradeop	-15.98*	-2.68*	0.17*	6.56*
	comm	-6.21	-1.58	0.25	14.57
	csh_i	-7.08	-1.80	0.25	12.98
MWI	RGDP[e]	-6.68	-1.81	0.27	13.66
	hc	-29.84***	-3.84***	0.13***	3.21***
	tradeop	-7.58	-1.94	0.26	12.04
	comm	-1.85	-0.74	0.4	35
	csh_i	-5.86	-1.71	0.29	15.53
MLI	RGDP[e]	-11.65	-2.38	0.2	8
	hc	-26.89***	-3.50***	0.13***	4.34**
	tradeop	-18.41**	-2.98**	0.16**	5.26**
	comm	-8.43	-1.97	0.23	11.06
	csh_i	-9.59	-2.19	0.23	9.49
ZMB	RGDP[e]	-4.08	-1.19	0.29	19.82
	hc	-8.22	-1.85	0.23	11060
	tradeop	-2.85	-0.94	0.33	25.19
	comm	-7.88	-1.82	0.23	11.99
	csh_i	-4.23	-2.62	0.19	6.67

***Significant at 1%, **significant at 5%, *significant at 1%. The tests include an intercept in the deterministic component.

Table 4: Perron and Vogelsang (1992) tests, first differences, AO

	Variable	ADF	T1	p-value
BDI	RGDP ^{e}	-7.91**	1975	0.868
	hc	-0.81	1988	0
	tradeop	-5.12**	1994	0.99
	csh_i	-7.87**	1970	0.64
	comm	-6.69**	1999	0.52
ICV	RGDP ^{e}	-6.79**	1978	0.02
	hc	-1.65	1968	0
	tradeop	-6.15**	1972	0.96
	csh_i	-4.62**	1987	0.75
	comm	-1.12	1978	0.33
KNY	RGDP ^{e}	-4.72**	1992	0.29
	hc	-2.23	1992	0
	tradeop	-8.50**	1996	0.48
	csh_i	-1.438	1981	0.97
	comm	-4.84**	1982	0.39
MWI	RGDP ^{e}	-1.25	2003	0.041
	hc_t	-2.93	2008	0.17
	tradeop	-5.03**	1992	0.99
	csh_i	-8.24**	1979	0.56
	comm	-6.85**	1974	0.089
MLI	RGDP ^{e}	-7.28**	1972	0.58
	hc	-2.02	1998	0
	tradeop	-2.89	1972	0.47
	csh_i	-6.15**	1981	0.73
	comm	-0.84	1978	0.64
ZMB	RGDP ^{e}	-6.43**	1996	0.03
	Hc	-1.92	1997	0
	Tradeop	-6.25**	1990	0.58
	csh_i	-2.58	1991	0.21
	comm	-6.67**	2004	0.16

***Significant at 1%, **significant at 5%, *significant at 1%. The tests include an intercept in the deterministic component.

Table 5: Perron and Vogelsang (1992) tests, first differences, IO

	Variable	ADF	T1	p-value
BDI	RGDP ^{e}	-8.11**	1976	0.06
	hc	-4.92**	1989	0
	Tradeop	-6.58**	1995	0.23
	csh_i	-7.74	1971	0.68
	Comm	-6.65**	1976	0.29
ICV	RGDP ^{e}	-5.13**	1979	0
	Hc	-1.36	1964	0
	Tradeop	-8.08**	1973	0.78
	csh_i	-7.44**	1988	0.97
	Comm	-7.37	1979	0.13
KNY	RGDP ^{e}	-7.71**	1993	0.06
	hc_t	-2.48	1989	0.03
	Tradeop	-8.47**	1997	0.19
	csh_i	-1.95	1969	0.47
	Comm	-5.82**	1983	0.23
MWI	RGDP ^{e}	-6.03**	2004	0.06
	Hc	-3.25	1994	0.12
	Tradeop	-9.09**	1993	0.96
	csh_i	-8.05**	1980	0.98
	Comm	-6.45**	1987	0.06
MLI	RGDP ^{e}	-7.25**	1973	0.19
	Hc	-3.25	1999	0.01
	Tradeop	-7.55**	1973	0.99
	csh_i	-11.35**	1982	0.72
	Comm	-5.97**	1979	0.19
ZMB	RGDP ^{e}	-6.53**	1992	0.04
	Hc	-2.89	1994	0.01
	Tradeop	-6.80**	1991	0.15
	csh_i	-2.94	1992	0.17
	Comm	-6.77**	2002	0.06

***Significant at 1%, **significant at 5%, *significant at 1%. The tests include an intercept in the deterministic component.

Table 6: Zivot and Andrews (1992) tests, levels, shift in levels and change in trend

	Variable	ADF	T1
BDI	RGDP[e]	-3.02	1970
	Hc	-3.97	1981
	Tradeop	-5.97**	1996
	csh_i	-4.85	1989
	Comm	-3.37	1987
ICV	RGDP[e]	-3.81	1980
	Hc	-4.01	1991
	Tradeop	-5.01	1986
	csh_i	-3.09	1983
	Comm	-3.01	1988
KNY	RGDPE[e]	-2.71	1977
	Hc	-5.24**	1976
	Tradeop	-4.44**	1997
	csh_i	-5.42**	1982
	Comm	-4.06	1991
MWI	RGDP [e]	-2.89	1998
	Hc	-3.80	1986
	Tradeop	-7.02**	1981
	csh_i	-4.79	1979
	Comm	-3.86	1969
MLI	RGDP[e]	-3.83	1985
	Hc	-4.34	1998
	Tradeop	-6.01**	2001
	csh_i	-4.72	1982
	Comm	-2.35	1977
ZMB	RGDP[e]	-3.06	1992
	Hc	-4.42	1991
	Tradeop	-5.27**	1981
	csh_i	-3.34	1975
	comm	-3.51	1998

***Significant at 1%, **significant at 5%, *significant at 1%. The tests include an intercept in the deterministic component.

Table 7: Zivot and Andrews (1992) tests, levels, change in trend

	Variable	ADF	T1
	$RGDP^e$	-2.77	1978
BDI	hc_t	-4.18	1990
	$tradeop_t$	-2.99	2002
	csh_i_t	-3.49	1982
	$comm_t$	-2.59	2003
ICV	$RGDP^e$	-3.49	1975
	hc_t	-3.79	1982
	$tradeop_t$	-2.95	1992
	csh_i_t	-2.73	1978
	comm	-2.09	1969
KNY	$RGDP^e$	-2.47	1978
	hc	-5.05**	1980
	$tradeop_t$	-4.09	2003
	csh_i	-2.70	1970
	$comm_t$	-4.01	1995
MWI	$RGDP^e$	-2.53	1970
	hc_t	-3.73	1992
	$tradeop_t$	-5.42**	1988
	csh_i_t	-2.75	1995
	$comm_t$	-3.64	1972
MLI	$RGDPE^e$	-3.93	1997
	hc_t	-4.82**	2000
	$tradeop_t$	-6.01**	2002
	csh_i_t	-2.89	1986
	$comm_t$	-2.43	2004
ZMB	$RGDP^e$	-2.87	1997
	hc_t	-4.14	1995
	$Ttradeop_t$	-4.76**	1999
	csh_i_t	-2.38	1985
	$comm_t$	-3.48	2000

***Significant at 1%, **significant at 5%, *significant at 1%. The tests include an intercept in the deterministic component

Table 8: Selected variables after unit root testing variables

BDI	RGDP; hc; tradeop; csh_i
ICV	RGDP; tradeop; csh_i
KNY	RGDP; tradeop
MWI	RGDP; csh_i
MLI	RGDP; tradeop; csh_i
ZMB	RGDP; hc; tradeop

The variables we carried on in the Cointegration analysis selected according to the outcome of the unit root tests.

Table 9: Engle and Granger (1987) cointegration tests

	deterministics	ADF	5% critical value
BDI	trend	-3.53	-5.07
	constant	-2.95	-4.69
ICV	trend	-1.29	-4.34
	constant	-1.16	-4.74
KNY	trend	-2.19	-4.36
	constant	-1.37	-3.91
MWI	trend	-2.49	-4.36
	constant	-2.40	-3.91
MLI	trend	-2.66	-4.77
	constant	-2.41	-4.36
ZMB	trend	-3.11	-4.72
	constant	3.12	-4.32

The tests 5% critical values are taken from MacKinnon (2010)

Table 10: Gregory and Hansen (1996a, 1996b) cointegration tests

	break	ADF	break date	5% critical value
BDI	C=S=T	-7.20**	1993	-6.84
	C=S	-6.17*	1989	-6.41
	C=T	-6.76***	1992	-5.83
	C	-5.66**	1994	-5.56
ICV	C=S=T	-4.72	1978	-6.32
	C=S	-4.12	1993	-6.00
	C=T	-3.69	1970	-5.57
	C	-3.82	1968	-5.28
KNY	C=S=T	-5.22	1995	-5.96
	C=S	-4.73	1996	-5.50
	C=T	-4.42	1998	-5.29
	C	-4.08	1999	-4.92
MWI	C=S=T	-4.81	1988	-5.96
	C=S	-4.43	1992	-5.50
	C=T	-4.61	1992	-5.29

	C	-4.40	1992	-4.92
MLI	C=S=T	-6.22*	1994	-6.32
	C=S	-5.26	1999	-6.00
	C=T	-5.20	2001	-5.57
	C	-4.64	2004	-5.28
ZMB	C=S=T	-4.68	1986	-6.32
	C=S	-4.56	1986	-6.00
	C=T	-4.71	1967	-5.57
	C	-4.43	1986	-5.28

***Significant at 1%, **significant at 5%, *significant at 10%. Maximum number of lags selected based on the and manually imposed, lags based on Schwert (1989) rule of thumb. The number of lags employed is based on a general to specific selection methodology, All the tests include an intercept and a trend.

Table 11: Johansen (1990) cointegration tests

	rank	eigenvalue	trace statistic	5% critical value
BDI	0	-	121.83	68.52
	1	0.68	67	47.21
	2	0.51	33.55**	39.68
ICV	0	-	49.79	47.21
	1	0.47	20.72**	29.68
KNY	0		25.03**	29.68
	1	0.24	12.05	15.41
MWI	0	-	23.39**	29.68
	1	0.23	10.09	15.41
MLI	0	-	47.86	47.21
	1	0.39	23.45**	29.68
ZMB	0	-	56.39	47.21
	1	0.49	22.05**	29.68

**Indicates failure to reject the null hypothesis at 5%. All the tests include an intercept and a trend.

Table 12: Johansen, Mosconi and Nielsen (2001) cointegration tests

	rank	eigenvalue	trace statistic		5% critical value
BDI	0	0.6	123.27	0.65	112.72
	1	0.53	76.93**	0.65	83.5
	2	0.28	39.08	0.65	58.23
ICV	0	0.54	69.35**	0.25	81.32
	1	0.33	32.79	0.25	56.35
	2	0.21	13.85	0.25	35.21
KNY	0	0.39	45.51**	0.75	56.35
	1	0.24	20.91	0.75	35.21
MWI	0	0.31	29.21*	0.65	58.23
	1	0.12	10.59	0.65	36.7

MLI	0	0.55	77.43**	0.75	81.32
	1	0.41	42.98	0.75	56.35
	2	0.29	19.82	0.75	35.21
ZMB	0	0.55	93.52	0.15	77.52
	1	0.46	54.04	0.15	53.31
	2	0.36	22.79**	0.15	32.92

**Indicates failure to reject the null hypothesis at 5%. *Indicates failure to reject the null hypothesis at 10%. All the tests include an intercept and a trend. The tests allow for a break in the trend at a given exogenous point in time.

5. Estimation of the VECM and inference on the long run equilibria

In this Section, we report the estimated vector error correction models for Burundi, Zambia and Mali, for which in Section 4 we found out, conditional on the structure of the deterministic components, at most one cointegrating vector might exist.[15] In equation (2) we report the general specification which we employed to test for cointegration while in equation (3) we report the specification for the cointegration tests with a restricted break in trend.

$$\Delta Y_t = \alpha \begin{pmatrix} \beta \\ \gamma \end{pmatrix}' \begin{pmatrix} Y_{t-1} \\ t \end{pmatrix} + \mu_j + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-1} + \varepsilon_t \quad (2)$$

$$\Delta Y_t = \alpha \begin{pmatrix} \beta \\ \gamma \end{pmatrix}' \begin{pmatrix} Y_{t-1} \\ tD_{t-k} \end{pmatrix} + \mu_j D_{t-k} + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-1} + \sum_{i=0}^{k-1} \sum_{j=2}^{q} \kappa_{j,i} I_{j,t-1} + \varepsilon_t \quad (3)$$

In equation (3) a trend-break dummy variable tD_{t-k} is restricted to the cointegrating vector and represents the trend break in the cointegrating trend-stationary relationship. Y_t represents our vector of variables from Table 8, represents the speed of error correction, is a vector of long run elasticities, is the coe¢ cient of the trend terms, D_{t-k} is the dummy break variable depending on the number of variables $\kappa_{j,i}$ and $I_{j,t}$ is an impulse dummy at the time of the endogenous break. Finally ε_t is a vector of i.i.d. errors. Equation (2) is employed as the basis for our estimation of the linear VECMs, while the break specifications were based on equation (3).[16] In Subsections 5.1, 5.3 and 5.2, we

[15] For the case of Zambia, the Johansen, Mosconi, and Nielsen (2000) tests detected at most two possible cointegrating vectors. However, given the trace statistic rejected the null hypothesis of at most one cointegrating relationship by a very short margin, we choose to conduct the estimation for Zambia considering only one cointegrating relationship.

[16] The use of the impulse break dummies is justified by the need to restrict the residuals to 0 given the initial value in the second Sub-period of our single break analysis. See Joyeux (2007) for further guidance. Note that in both estimations the trend term was restricted to the cointegrating relationship. This allows the cointegrating

will provide a case by case overview of the long run coefficients and loadings, commenting the results, which are visible in the appendix of the article.[17]

5.1. Mali

After its independence in 1960, Mali's democracy started flourishing in 1992 after almost 23 years of military dictatorship. Up until 2011 and after the end of the dictatorship, the country's annual growth rates remained generally positive. It is no surprise that the Gregory and Hansen (1996a) test detected a change in the trend of the equilibrium relationship.[18] Following our test results in the linear VECM, all coefficients of the cointegrating equation appear significant at 5%, exception made for the gold price coefficient, which appears significant only at 10%. The speed of adjustment coefficient indicates a speed of adjustment to the equilibrium values of around 18% each year, three times higher than the average panel 6% estimate reported in Collier and Goderis (2012). The long run elasticity of the real commodity price has a negative sign in the cointegrating vector, capturing a long run positive effect of higher gold prices in Mali. A 10% increase in the price of gold would thus lead to a 1.6% higher long run level of real GDP. Such result is a striking one, albeit well distant from the 5.9% lower GDP level for Nigeria or the overall 16.8% decrease estimated in the panel data analysis of Collier and Goderis (2012). Switching our attention to the estimation accounting for a single break, we observe a strong decrease in the rate of decay of the disequilibrium, which lowers to 2% per year, and an inversion of the sign of the elasticity of GDP with respect to the price of gold, where this time a 10% increase in the price of gold would lead to a 6.2% lower long run level of real GDP. However, the long run relationship appears to be statistically not different from 0, since the loading coefficient is statistically insignificant. The result, on the light of the possibility of a structural break which might have taken place after the beginning of the democratization process in Mali, appears puzzling. Not only the non-existence of the cointegrating vector could be taken as lack of evidence of a possible long run equilibrium, but the lack of clear results after accounting for the democratization process adds up as a potential critique to the rent seeking theory related to the commodity curse or perhaps to the quality of the democratization process in Mali.

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relationship to have a trend in equation (2) and a broken trend in equation (3), and the level data to have a trend as well as an unrestricted intercept appears in the deterministic component outside of the relationship.

[17] The complete output is reported in Tables 14 to 18.

[18] We are aware of the fact we might have adopted a set of impulse break dummies to account for years where coups d'état or other events exogenous to the long run equilibrium took place. However, given the limitations imposed by the length of the time series and the eventual loss of degrees of freedom, alongside with the persistent issue of data mining, we choose to focus the analysis on the possibility of an endogenous break only, limiting exogenous components to the deterministic set-up of the estimations.

5.2. Burundi

Since its independence, which took place in 1962, Burundi has been plagued by moments of social tension, which sparked in a series of ethnic conflicts in 1994 between two major ethnic groups, the Tutsu and the Hutu. Only in 2001 a power sharing government, favored by South Africa, allowed for a general cease-fire, granting the first general, democratic election in 2004. However, the authoritarian attitude of the government following the 2010 elections, cast a shadow over the democratic values of the Burundian institutions. In Table 10, the 10 tests suggest the presence of a break in the potential cointegrating relationship somewhere at the beginning of the nineties, result which is furtherly highlighted by the 12 test once 1992 is chosen as a break date. Visibly, any inference on the linear model for Burundi would be biased by the fact that the loading coefficient, which is equal to 0.05 and is not statistically significant. As such, at least in terms of linear modelling, there is no error correction and the cointegration relationship has no economically meaningful interpretation. The nonlinear specification brings forth a similar result, but casts once more doubts over the existence of a long run equilibrium. Remarkably, the loading coefficient would indicate that the economy diverges from an hypothetical equilibrium at the rate of 8% each year. The coefficient for the price of coffee in the cointegrating relationship is negative, implying a positive long run relationship between GDP and coffee prices which would not go against what we would expect from a commodity which is not subject to rent capture, but it is statistically not different from 0.

5.3. Zambia

Contrary to the countries analyzed up until now, since its peaceful independence in 1964, Zambia has been characterized by a relatively stable government and overall political stability. The Gregory and Hansen (1996a) test indicates a potentially meaningful break date in the cointegrating relationship in 1986, a date perhaps distant from the late nineties, when the privatization of the mining sector, mainly based on copper extraction, began to draw the attention of foreign investors, increasing FDI and output. Results in the linear specification could be immediately interpreted as confirming the existence of a long run resource curse effect regardless of the degree of political stability in the country. The result appears to side with the historical vision of Sachs and Werner (1997) rather than with those authors who support the thesis of the political channel as a mean of transmission of the resource curse. The estimated long run elasticity of -1.87 is found to be in the range of the elasticities discovered by Collier and Goderis (2012) for the non agricultural commodity export price index, but leads to an excessive reaction of long run GDP levels to changes in the Commodity price. The relationship appears to be non-interpretable, since the loading coefficient appears statistically not significant. Moving to the nonlinear specification, the

loading coefficient for the first difference of Real GDP, significant at the 1% level, appears to indicate an even faster half-life of disequilibrium at a convergence rate of 27% per year. Once again, the convergence rate appears very high relative to our benchmark index estimation, Collier and Goderis (2012), while in the cointegrating relationship no evidence of a negative effect of mineral prices over GDP in the long run could be found, given the negative sign of the elasticity of GDP to Copper prices and the statistical significance of the coefficient.

6. VECM and VAR impulse response function analysis

This Section switches the analysis from the static inference on the cointegrating vector to the computation of the transitory or permanent effect of an innovation in prices to the long run equilibrium level of GDP the economies we studied appear to converge to. We present, based on the past VECMs, some evidence that a sudden price variation at a given point in time might permanently affect the long run equilibrium level of the economies in the countries were we found our system of variables to be cointegrated.[19] We set up an impulse response analysis based on variable levels form of the countries were we found the cointegration relationship to exist and be statistically significant.[20] This results have been paired up with results from orthogonalized impulse responses based on a VAR system with an innovation equal to one standard deviation, which we employ to test for short/medium run effects of price shocks to growth. The ordering strategy of the variables for the Cholesky decomposition was organized such that a one standard deviation impulse in the innovation of the international price variables has a contemporaneous impact on all the other variables following along the lower triangular matrix, as we would normally expect in commodity-dependent countries with no price setting power, and consistently with the Dutch disease assumptions. The ordering of the residual variables would then be tradeop, hc, csh_i and finally RGDP. In other terms, this ordering implies that a shock in the degree of trade openness in a small open country is very unlikely to have a contemporaneous effect on the price of the most exported commodity, but will have strong effects on the remaining variables because of the state of dependence of the economy exports on that variable, affecting human capital and physical capital accumulation. Similarly, we expect a shock on human capital to have almost immediate effects on investment decisions, but

[19] The cointegrating vectors we identified in the past section should be seen as "static" relationships, where any alterations of the equilibrium set by the elasticities is corrected at a given speed according to the loading coefficient. This section instead, investigates the commodity curse effect in terms of responses to shocks, both in the levels and the first difference of the variables. Evidently, conclusions drawn in this section will differ from those on the equilibrium relationship in the past section.

[20] Although a Wold moving average representation, required for impulse response function analysis, an impulse response matrix can be computed for a VECM as if it was a VAR. So, IRFs are available even if some or all the variable are not I(0). Impulses hitting a nonstationary system, can have a permanent effect on the shocked variables. We would expect the results of the visual analysis of the error forecast functions to be not dissimilar from the conclusions we draw from the inference on the cointegrating vector in the previous section.

no contemporaneous effects on the other variables since the degree of the trade openness variable partially depends on imports, which we assume are exogenous. Finally, we expect a shock to the variable related to gross fixed capital formation, csh_i, to feed into GDP immediately but not directly into the remaining variables. Percentile confidence intervals for the VECM and the orthogonalized VAR were bootstrapped with one hundred drawings with replacement from the centered residuals of the VAR and the IRF calculated for a twenty years period.

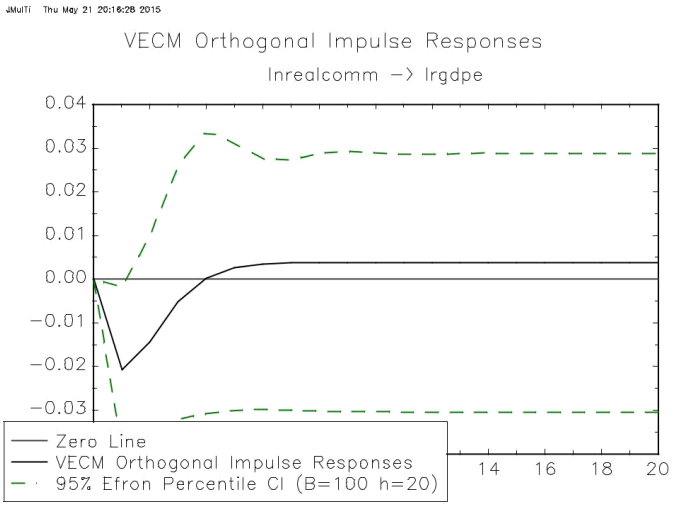

Figure 1: Mali, Levels IRF

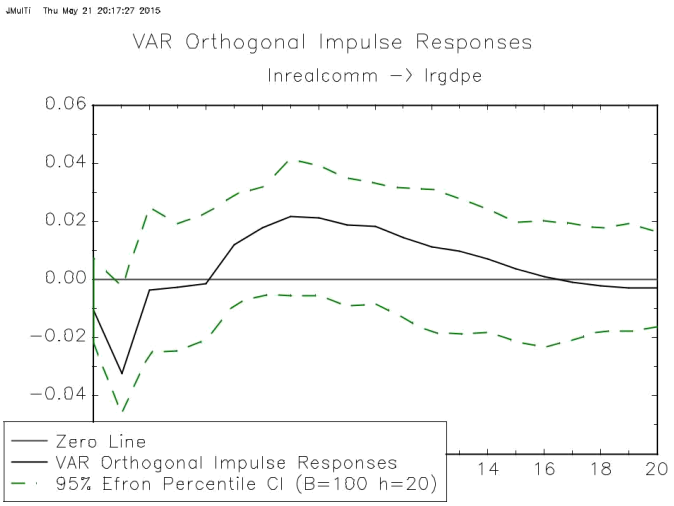

Figure 2: Mali, first differences IRF

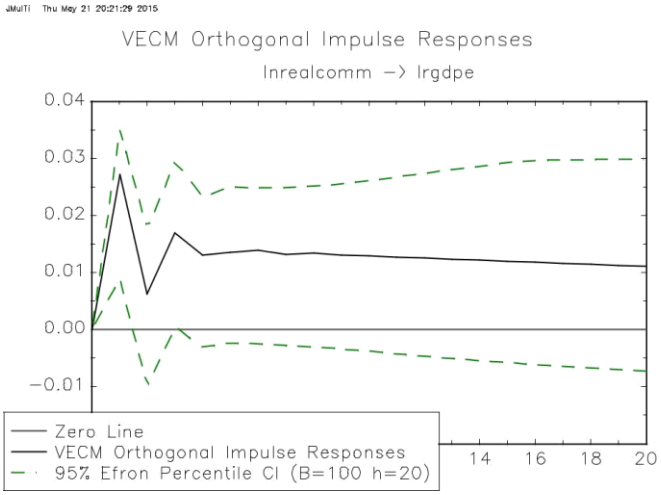

Figure 3: Burundi, Levels IRF

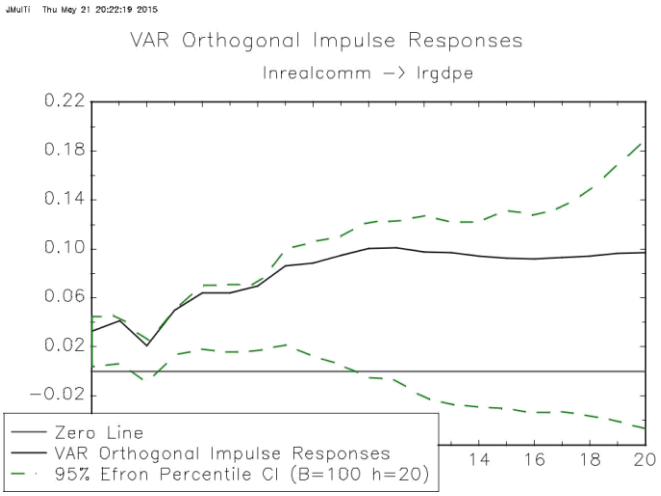

Figure 4: Burundi, First Differences IRF

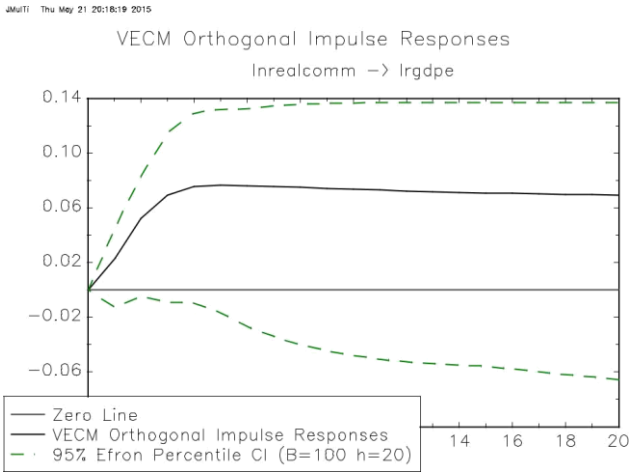

Figure 5: Zambia, Levels IRF

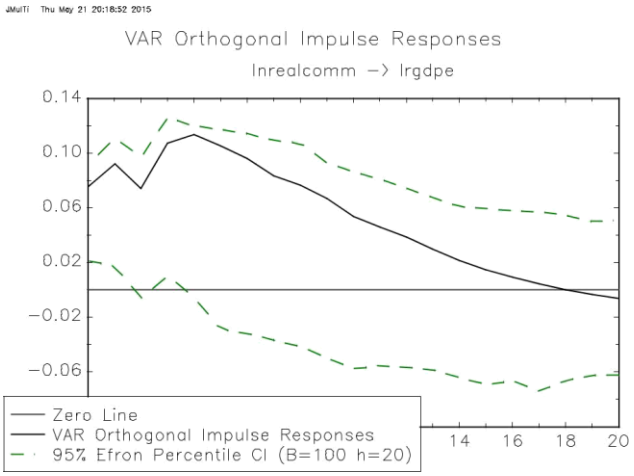

Figure 6: Zambia, First Differences IRF

The analysis of the IRF Figures 2, 3 and 5 would then allow us to check whether or not the effect of a shock to the commodity prices causes a permanent change in the long run equilibrium levels, while Figures 1, 4 and 6 can be interpreted as

the 20 years horizon transitory effect of price deviations on GDP growth.[21] As we have already pointed out, the results are interpreted on the light of the price transmission channel of the resource curse hypothesis affecting the long run steady state GDP and growth in the short/medium run. In Mali, a one standard deviation shock to the price of gold appears to have no substantial effect on the long run GDP level (Figure 2). The shock however, appears to have a short and negative five periods effect on growth in the country (Figure 1), with an initial negative jump at time 0, after which the response variable becomes positive for around thirteen periods and then converges again to its initial state. In Burundi, an innovation in the price of coffee appears to generate a permanent effect on the GDP equilibrium level (Figure 3). The shock in the first differences VAR also appears to cause a persistent short run positive response on growth, which lasts for at least as long as the horizon of the IRF (Figure 4). In Zambia, a positive shock to the price of Copper implies a positive shift of the equilibrium level of GDP in the long run (Figure 5). GDP growth response to the price of copper remains consistently positive, with the effect dying out only eighteen periods after the initial shock (Figure 6). Overall, economic growth appears to be positively influenced by positive variations in the commodity prices, with the exception of an initial, negative response in Mali to a shock in the gold price, and long run GDP to be positively affected by price shocks, indicating no evidence of the commodity curse price channel hypothesis in the short or the long run.

7. Conclusions

Our paper analyzed the effect of changes in the price of leading exported commodities in a group of commodity exporting countries. Our results shows evidence of a possible long run relationship between GDP, a set of relevant controls, and the selected commodity prices in three out of the six analyzed countries, conditional on the existence of a single structural break that we loosely identified as the beginning of a transition period to more democratic institutions in each of the analyzed countries. Our estimations led us to conclude that shocks in the prices of leading exported commodities not only cause a positive response in short run growth, but influence as well the steady state level of GDP in the long run. Finally, such results represent evidence rejecting the idea of the price channel as a medium of transmission of the commodity curse, both in the long and in the short run.

[21] Note that we did not make any comments on the bootstrapped confidence intervals, as one hundred drawings might perhaps not be enough to safely make inference based on them.

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THE NATURAL RESOURCE CURSE: A SOCIOECONOMIC AND SOCIOPOLITICAL ANALYSIS OF CAUSES AND SYMPTOMS COMBINED WITH MACROECONOMIC SOLUTION SUGGESTIONS FOR INTERNATIONAL DEVELOPMENT POLICY AND PRACTICE

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Abstract

The "natural resource curse" has attracted demands for more research in recent literature. This research firstly frames that literature conceptually by giving an exact overview of the development of the terminology and symptoms of the resource curse. It then examines explanatory models and theories for the resource curse for their scientific thoroughness and convincingness, before analyzing several of the sociopolitical and macroeconomic challenges posed by it, and then evaluating a range of suggested solution models for their socioeconomic, sociopolitical and macroeconomic viability, with a macroeconomic core argument. The first main contribution of this research lies on the conceptual level, namely a unique synthesis of explanation models, encountered challenges and proposed solutions that does not yet exist in this complex yet concise way in the literature. The second main contribution, on the methodological level, fits the complexity of the natural resource curse and respects the afflicted people and countries, by combining a multidisciplinary and qualitative approach with a socioeconomic and sociopolitical scope and a macroeconomic investigation. The qualitative approach integrates literature requests for interdisciplinary, qualitative and collaborative methodologies. Thus oriented, we will evaluate national and international suggested pathways, practices and policies for today's globalizing world from macroeconomic perspectives, specially focusing on combined international political and national macroeconomic solution models and policy measures, such as development aid and non-aggressive international intervention, which stand the best chances of being welcomed internally in the country, individually by its leaders, institutionally by its governments, and internationally by the world community. Finally, this research synthesizes eleven solution suggestions, namely four sociopolitical and socioeconomic ones and seven macroeconomic ones, across social and economic sciences and disciplines. Thus its overall contribution to development studies and macroeconomics lies in offering conceptually solid and practically viable socioeconomic and macroeconomic options, to benefit both developed and developing nations and world regions.

Keywords: Resource Curse, Dutch Disease, Resource Trap, Macroeconomic Development, Development Economics.

JEL Classification: E61, E71, F42, F43, F62, O11.

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1. Introduction and Overview

1.1. Recent Research and Historical Roots

The most recent literature summarizing macroeconomic research on the resource curse openly admits that there is still a lot to find out, even after "what we have learned from two decades of intensive research" (Papyrakis, 2017, p. 175). Along these two decades of research, it has been acknowledged (see Gilberthorpe and Papyrakis, 2015, p. 382; Humphreys, Sachs and Stieglitz, 2007, p. 1) that the term "resource curse" was first coined by Richard Auty in his 1993 book *Sustaining Development in Mineral Economies: The Resource Curse Thesis*, when he asserted under the book's first heading, "The Resource Curse Thesis and Mineral Economies":

> "The conventional view concerning the role of natural resources in economic development has been that the resource endowment is most critical in the early low-income stages of the development process…However, a growing body of evidence suggests that a favorable natural resource endowment may be less beneficial to countries at the low- and mid-income levels of development than the conventional wisdom might suppose. Two important pieces of this evidence are the developing countries' postwar industrialization efforts and the performance of the mineral-rich developing countries since the 1960s" (Auty, 1993, p. 1).

Corresponding to its late-20th century academic discovery and discussion, the phenomenon of the resource curse is widely viewed as one of the modern era (Barbier, 2005, p. 2; Ross, 2016, pp. xiv, 11). The "modern era" in this sense goes back to the age of transatlantic discoveries, current with macroeconomic literature invoking the example of 17th-century Spain, after having profited from a century-long influx of New World resources, economically and industrially still fell behind the resource-poor Netherlands (Moss-Lambert and Majerowicz, 2015, p. 33; Ross, Torvik and Verdier, 2006, p. 450; for a world history framework see Frankopan, 2015, pp. 243-263; Karl, 1997, pp. 36-40).

1.2. Terminology and Differentiation

Some authors use a synonym to resource curse, namely "Dutch Disease" (see Auty, 1993, p. 5; Collier, 2008, p. 39). This term was coined by a 1977 article in a 1977 issue of *The Economist* titled "The Dutch Disease", named after the 1959 discovery of the Groningen natural gas field (at that time the largest natural gas field in Europe and the tenth largest in the world, see Whaley, 2009) in the North Sea off the Netherlands' northeastern coast, and its effect on the Dutch economy: soaring gas extraction and exports brought in foreign currency,

appreciated the Dutch currency, the guilder (which, according to some, is the main cause of the Dutch disease, see Boianovsky, 2012, p. 59; Sachs 2007, p. 182), decreased global competitiveness of other Dutch exportable sectors and goods, let the manufacturing sector decline in favor of the oil sector, and finally unemployment rates quintuple and corporate investments plummet.

Some differentiate more precisely between the resource curse as a result of "weak institutions that facilitate corruption or rent-seeking", and the Dutch disease as "a market failure" (Bresser-Pereira, Oreiro and Marconi, 2015, p. 70; similarly Snowdon and Vane, 2005, p. 654). Some expressly "reject the distinction between the Dutch disease and the natural resource curse", as these are "the same phenomenon, seen from two angles: the economic one and the moral and political one" (Bresser-Pereira, Oreiro and Marconi, 2015, p. 71). This research and author differentiates and uses "resource curse" for terminological and methodological precision and consistency, to focus clearly on socioeconomic, macroeconomic and resource instances that could occur worldwide, and to enhance the generalizability and applicability of its final solution suggestions.

2. Literature Review

2.1. Resource Locations, Materials, and Counterexamples

The literature admits that "low-income countries that most desperately need money are also the most likely to be struck by the resource curse" (Ross, 2012, p. 11), conceding that "the resource curse is…a global phenomenon". Most agree that is "of major relevance for Africa" (Lay and Mahmoud, 2005, p. 58; similarly Busia and Akong, 2017, p. 175; Kararach and Odhiambo, 2017, p. 148). Consequently, the African countries most consistently mentioned as afflicted or at least endangered by the resource curse are (alphabetically): Algeria, Angola, Chad, Equatorial Guinea, Gabon, Ghana, Guyana, Kenya, Liberia, Libya, Mozambique, Nigeria, Sierra Leone and Tanzania. Two other world regions are also often mentioned, namely South and Central America as well as the Caribbean, with the nations of Bolivia, Cuba Venezuela, as well as Trinidad and Tobago. Finally, in the Asian and Pacific region, the most mentioned nations are Malaysia, Mongolia, Myanmar, Papua-New Guinea, Sri Lanka and Timor Leste (Akacem and Cachanosky, 2017, p. 1; Auty, 2017, p. 264; Hilson, 2017, pp. 229-231; Mosley, 2017, pp. 4, 176; Moss, Lambert and Majerowicz, 2015, pp. 2, 34; Pick, 2010, pp. 267-270; Ross, 2012, p. 12; Saylor, 2014, p. 210).

By contrast, the literature also provides counterexamples of countries that have managed to avoid the resource curse despite having started out resource-

dependent, such as Botswana, Chile, Ecuador, Malaysia, Oman and Thailand (Esanov, Raiser and Buiter, 2006, pp. 52-53; Robinson, Torvik and Verdier, 2006, p. 463-465). Two of these countries will be analyzed below in depth: one that stands for greatest affliction by the resource curse, namely Nigeria, and one that exemplifies the potential of avoiding it, or overcoming its initially harmful effects, namely Botswana.

The predominant, yet by no means exclusive, resource curse material seems to be oil: some hold that "the resource curse…is more accurately a mineral curse, since these maladies are not caused by other kinds of natural resources, like forests, fresh water, or fertile cropland. Among minerals, petroleum – which accounts for more than 90% of the world's mineral trade – produces the largest problems for the greatest number of countries. The resource curse is overwhelmingly an oil curse" (Ross, 2012, p. 1). Fittingly, it is pointed out that "of Africa's fifty-five countries, fifty are either producing or exploring for oil" (Moss, Lambert and Majerowicz, 2015, p. 32).

Yet the curse can occur with any abundant resource, especially in the "extractive industries" that deal with "oil, gas, and other minerals" (Robinson, Torvik and Verdier, 2006, p. 448). Correspondingly, some of the other precious metals that can be extracted are gold and silver (Hilson, 2017, p. 229) or even less precious ones as tin in Bolivia (Mosley, 2017, p. 176; Saylor 2014, p. 210), or diamonds, iron, rutile and bauxite in Sierra Leone (Mosley, 2017, p. 26; World Bank, 2005, p. 306), but even agrarian products such as soy (see Farthing and Kohl, 2014, p. 84), rubber in Malaysia, tea in Sri Lanka, or sugar in Cuba (Mosley, 2017, p. 4). Hence considering the curse only as a matter of oil seems overly restrictive and limiting for reflection and solution, also in view of ongoing and future discoveries and extractions of these and other valuable materials. Finally, even the most restrictive literature admits that "energy importers cannot circumvent the oil curse; they must help solve it" (Ross, 2012, p. 3). Hence it seems reasonable to apply the insights gained from research on the resource curse also to forms of renewable energy, such as direct and indirect (photoelectric) solar, hydroelectric, wind, geothermal or biomass energy.

2.2. Paradox: Predicted Blessing Becomes Blight

The literature names the anticipation that a country's resource wealth should lead to its well-being "resource blessing" (Esanov, Raiser and Buiter, 2006, p. 52; Gilberthorpe and Papyrakis, 2015, p. 384; Van der Ploeg, 2001, p. 366) or "catalyst to prosperity" (Collier, 2008, p. 38). Until the 1960s, this anticipation went hand in hand with expectations of resource-blessed countries to follow "resource-based development" patterns, connected to capitalization, technological and social investment, innovation, and development (Barbier, 2005, p. 2; similarly Boianovsky, 2012, p. 60), and potentially also benefitting

from economic expansion or alleviation of credit constraints (Collier, 2008, p. 38; Gilberthorpe and Papyrakis, 2015, pp. 382, 384). Historical examples invoked were the times of European and American industrial expansion, large-scale emigration, as well as colonial export and exploitation patterns between 1870 and 1913, resulting in a global "core" and "periphery" (Barbier, 2005, p. 81-83). This prediction and promise was further reinforced by instances of countries that fulfilled that promise, such as oil-revenue-rich Arabian and Gulf countries like Saudi Arabia and Kuwait (Collier, 2008, p. 38). For the 21st century, Sachs (2007, p. 173) expresses the expectation of a resource blessing for oil thus:

> "Oil is…an enormously valuable resource, that can bring enormous economic benefits to an economy…Oil-rich states have actually tended to outperform their neighbors which lack oil…[and] region by region, tend to have higher per capita income levels (in purchasing power terms). This often corresponds to higher levels of private consumption as well. In most other categories of well-being – life expectancies, child mortality rates, electricity use per capita, paved roads – oil producers are better off than their oil poor counterparts".

However, the resource curse has an inherent "contradiction" (Bresser-Pereira, Oreiro and Marconi, 2015, p. 70) that some authors name the "paradox of plenty" (taken from Karl's 1997 book title; Hanson, 2017, p. 40; Kelbert, 2011, p. 188; Lay and Mahmoud, 2005, p. 46; Roberts, 2017, p. 68), and that often foils that expected blessing, so that the resource blessing translating into a country's well-being is now considered by the literature as the exception, rather than the rule (Collier, 2008, p. 38). As examples from the last decade of the 20th century still being referred to, "among the larger newly industrializing countries, the biggest countries like China, India, Brazil and Mexico have slower progress with industrial diversification than the smaller resource-deficient countries like [South] Korea and Taiwan (Auty 1993, p. 2; similarly Moss, Lambert and Majerowicz, 2015, p. 33). Sachs, too, reevaluates his optimistic view of oil-rich countries:

> "The 'curse' is real…economic performance of oil economies has fallen far short of potential, and sometimes disastrously so. Oil earnings have rarely lived up to the plausible expectation that they should be a stimulus to long-term economic development. Many oil-rich countries experienced declines in per capita income between 1970 and 2000, and quite a few fell into deep debt crises" (2007, p. 174).

2.3. From Curse over Dependency to Trap

A country thus afflicted by the resource curse might also find itself in a "resource-dependency" (Barbier, 2005, p. 9; Esanov, Raiser and Buiter, 2006, p.

52; Johansson, Patwardhan, Nakicenovic and Gomez-Echeverri, 2012, p. 358), which can grow into a fully-fledged "natural resource trap" that makes it even harder to escape or grow out of it (Barbier, 2005, p. 9; Collier, 2008, pp. 38, 50; De Sousa, 2013, p. 64; Esanov, Raiser and Buiter, 2006, p. 52; Mosley, 2017, p. 4; Ness, 2016, p. 502; Watts and Peluso, 2014, p. 192). As Sachs (2007, p. 177) points out: "The poverty trap works as follows…Core public goods…are generally deficient, sometimes so much so that their absence impedes investments by the private sector…The profitability of private investment depends on complementary public investments (in key infrastructure, health, education, etc.). Public investments, however, require budgetary outlays. In impoverished countries, those outlays are constrained by poverty itself…Thus, poverty leads to underinvestments in public goods, which in turn lead to under-investments in the sector, and poverty continues or worsens (for example, because of continued population growth). The causal chain, and vicious circle, is therefore as follows: Poverty → Lack of public finance → Lack of public goods → Lack of Private investment → Poverty" (similarly Johansson, Patwardhan, Nakicenovic and Gomez-Echeverri, 2012, p. 358).

2.4. Macroeconomic Explanations for the Resource Curse

2.4.1. Complex and Concise Explanations

Macroeconomic literature tends to explain the resource curse either by concisely bundling together complex connections, or by focusing on a few single reasons and theories. As an example of the former way, some authors provide sweeping explanations, but do not specify particular countries:

> "When a country is poor, its society is unstructured, its institutions are weak, its public moral standards are low; and its corrupt elites…will capture some of the Ricardian rents through rent-seeking…The poorer the country is, and the more exposed it is to global capitalism, the more disorganized is its society, the weaker are its institutions, the more difficult it is to govern…Among poor countries, the richer a country is in mineral resources, the more likely it is to be at the mercy of corruption and civil wars…The fundamental cause of political instability, civil war, corruption, and the lack of democracy in poor countries is that…the economic surplus is appropriated not in the market, through profits, but in politics, through control of the state" (Bresser-Pereira, Oreiro and Marconi, 2015, pp. 71-72; similarly Moss, Lambert and Majerowicz, 2015, pp. vii, 33).

Some link environmental concerns to the country example of Nigeria and the resource of oil:

> "Countries such as Nigeria have found that…misdirected oil revenues can lead to massive corruption and waste. Other sectors of the economy are starved of investment and resources, as available resources go primarily toward oil production. And because oil is an exhaustible resource…overexploitation of natural resources can lead both to environmental degradation and to economic distortion" (Goodwin, Harris, Nelson, Roach and Torras, 2014, p. 395; similarly Ross, 2012, p. 6; Sala-i-Martin and Subramanian, 2013, 570).

Finally, some authors classify countries according to positive to negative effects of income levels and policies, insistently highlighting some key functions, roles and responsibilities of national institutions (which is an aspect that will be discussed in depth further below):

> "Some of the highest-income countries in the world [Hong Kong, Singapore, Japan] have few natural resources…Conversely, many resource-rich countries such as Nigeria, Venezuela, and Russia have both low income levels and poor records of economic growth. These observations highlight the importance of institutions. Countries that follow sound policies are able to import resources required for growth and prosperity. Without sound institutions and policies, however, resource-rich countries are generally unable to sustain strong growth and achieve high levels of income. Moreover, abundant resources can often undermine the incentive to adopt sound institutions" (Gwartney, Stroup, Sobel and Macpherson, 2016: 334; similarly Akacem and Cachanosky, 2017, pp. 2-3, 7-8; Lay and Mahmoud, 2005, pp. 48, 51; Roberts, 2017, p. 68; Robinson, Torvik and Verdier, 2006, p. 451).

2.4.2. Single-Cause Theories

As for the second way of macroeconomic explanations of the resource curse, below are several main and sub-theories discussed in more detail. To begin with, the "Resource Curse Hypothesis" holds that in afflicted low-to-middle income economies, a dependency mainly on natural resources is not a sufficiently strong motor of nation-wide economic stimulation and sustained growth (Barbier, 2005, p. 3), since any positive spillovers from locally exploited resources do not affect the national economy meaningfully and measurably enough. Aggravating this macroeconomic outcome internationally, any initially advantageous trade terms due to the country's comparative advantage based on the extracted resource deteriorates over time, since the price of the resource is bound to fall over time, thus deepening the income gap between extracting country and its developed trade partners. In the end, the country needs to export ever more of its resource, just to satisfy its import requirements (Gilberthorpe and Papyrakis, 2015, p. 383).

The "Open-Access Exploitation Hypothesis" argues that while the resource might be rich and full of potential, poor infrastructures of access and exploitation, such as over rights, benefits and distributions, might turn the initial advantage of the resource on its head, its mismanagement leading to poorer macroeconomic and social welfare and the country's international comparative standing (Barbier, 2005, p. 9; Esanov, Raiser and Buiter, 2006, p. 52;).

The "Factor Endowment" or "Resource Endowment" hypothesis takes this explanation to its logical conclusion, suggesting that it is exactly the resource wealth that causes problems for its host countries, due to their lower socioeconomic development (expressed for instance in their need to focus exclusively on their main resource, or their educational levels lagging behind the global average), or due to national inequalities and social injustices, which lock these countries in the mentioned resource dependencies, and prevent them from growing and developing out of those predicaments (Johansson, Patwardhan, Nakicenovic and Gomez-Echeverri, 2012, p. 358).

The earlier mentioned "Dutch Disease Theory" can itself be divided into three explanatory sub-models or hypotheses: the "Resource Movement Effect" holds that secondary and tertiary production factors and activities, such as of labor and capital, shift towards the primary resource sector, even if that movement is less dramatic in developing countries that are already capital-weak and labor-rich (Gilberthorpe and Papyrakis, 2015, p. 383).

As a second sub-model of the Dutch Disease, the "Spending Effect" focuses on the inflationary pressures on the national economy that result from the initial abundance of income from extracting the primary resource. As this income rises and floods the national economy, the competitiveness of other sectors declines, changing the national economic structure and deteriorating the non-primary trade sectors, thus undermining the macroeconomic development (Gilberthorpe and Papyrakis, 2015, p. 383).

According to a third sub-model of the Dutch Disease, which this author calls "Export-Import Competition Theory", resource exports cause a rise in the country's exports, appreciating its currency, with a double detrimental effect on the country's trade balance: on the one hand, it makes the country's other export articles and activities less competitive on the world market; on the other hand, it also makes the country's imports more expensive, since all other countries now need to pay this country's products more expensively in its appreciated currency (Espinoza, Fayad and Prasad, 2013, p. 6; similarly El Serafy, 2013, p. 348). The literature gives the example of Nigeria in the 1970s, where the profits from recently discovered oil made its other staple products, such as cocoa and peanuts, more expensive for foreign importers, thus first lessening and then collapsing the lucrative trade of these two products (Collier, 2008, pp. 39, 121).

According to a macroeconomic explanation which this author labels "Reduced Savings Rate Theory", resource abundance and the spending effect lead to reduced savings and investment rates, due to the nationwide impression of the people that savings and investments are less decisive for providing current and protecting their future income levels (see Gilberthorpe and Papyrakis, 2015, p. 383).

Similarly, a macroeconomic explanation which this author calls "Debt Overhang Theory" describes the practice of resource-rich countries to use their debts as collaterals for their incurred debts on the world market, where the results of such "boom-based borrowing" often are national economic crises, such as 1975 in Indonesia or 1982 in Mexico (Gilberthorpe and Papyrakis, 2015, p. 383).

According to a last macroeconomic explanation, which this author calls "See-Saw-Theory", the volatility of world market primary resource prices leads to a macroeconomic see-saw effect for the country, besides investor insecurity, difficulties to create stimulating industrial regulatory frameworks, and governmental challenges to impose financial discipline and to secure sustainable fiscal policies (Gilberthorpe and Papyrakis, 2015, p. 383).

Finally, some authors bundle up several of the above explanatory hypotheses, theories or models, and suggest a "vicious cycle" of ever increasing resource riches resulting in ever diminishing economic development returns (Barbier, 2005, p. 3-4). Explanatory theories, models and explanations usually stop here. This research, after outlining its methodology, will go further, by investigating the resource curse with several sociopolitical and macroeconomic challenges it poses, and then by developing and evaluating a range of suggestions for its solution.

3. Research Methodology

3.1. Multidisciplinary Framework of Analysis

Some recent literature on the resource curse stresses the need for multidisciplinary and collaborative methodological approaches on the macroeconomic level:

> "There is…the need for a more holistic cross-scale framework of analysis. The scale of fragmentation of research on the resource curse largely overlaps with a disciplinary basis. The macro and meso resource curse is mainly dominated by economists and political scientists…The insights from all these different disciplinary approaches are naturally invaluable to understanding how the resource curse might (or might not) materialise at different levels...There is a

> need to approach the resource curse from a more collaborative disciplinary angle, which will permit the defragmentation of the literature…across…disciplinary lines and foster the development of a more socially aware…policy that shows commitment to sound macroeconomic performance as well as the safeguarding of social and cultural capital" (Gilberthorpe and Papyrakis, 2015, p. 388).

3.2. Qualitative Research Methods

While some of the literature keeps asking for more research on the resource curse with quantitative methods (Van der Ploeg and Poelhekke, 2017, pp. 205-211), others point out that there are even more and bigger qualitative lacunae (Gilberthorpe and Papyrakis, 2015, pp. 381-386). Calling for interdisciplinary, collaborative and qualitative research approaches to defragment and unify the literature, macroeconomic literature explicitly names the branches of economics, political science, sociology, anthropology, international relations, and psychology) and the diversity of resource sectors, such as mining, oil, agriculture, and energy (Collier, 2017, pp. 217-219; Gilberthorpe, 2017, pp. 186-188; Gilberthorpe and Papyrakis, 2015, p. 381-382).

3.3. Sociopolitical and Macroeconomic Analysis

Our multidisciplinary approach combines a sociopolitical and socioeconomic scope with a macroeconomic analytical focus. The methodological contribution of this research is thus its macroeconomic angle on specific sociopolitical and socioeconomic challenges. Hence below we will continue to investigate the resource curse, namely by analyzing three of the most incisive sociopolitical, socioeconomic and macroeconomic challenges, and then by analyzing and evaluating on the one hand four sociopolitical and socioeconomic and on the other hand seven macroeconomic solution suggestions, before concluding with our recommendations for the conceptually and practically most viable ones.

4. Analysis and Discussion

4.1. Sociopolitical and Macroeconomic Challenges

4.1.1. Challenge 1: The Resource Curse Undermining Democracy

Political economists suggest that resource revenues tend to worsen political governance. For some, the key problem is that the resource curse destabilizes or damages democracy: while "resource-rich and policy-poor" (Collier, 2008, p. 178) countries are arguably those that are most in need of democratic structures

for a fair distribution of their riches and revenues, often the opposite is true, as resources, exemplified by oil, tend to reduce the probability of a democracy, and instead raise those of an autocracy. The main reasons are that those in power, to remain there, often misuse resources by replacing taxes with resource rents, reducing internal accountability, and raising spending on internal security and political patronage (Gilberthorpe and Papyrakis, 2015, pp. 384-385; Lay and Mahmoud, 2005, p. 48; Ross, 2012, pp. 5-6, 11).

Hence the occurrence of resources perverts precisely those democratic processes that are designed to benefit the people and the public, such as nation-wide election campaigns and public service deliveries: campaigns can now increasingly be influenced by bribing key public opinion leaders, and public services increasingly be suspended in favor of private patronage and clientelism, both of which, cynically but factually, are more cost-effective measures of securing power and influence. All this spells out the conditions and circumstances of autocracy. It is especially pointed out that an increase in resources reduces the need to tax, and with that the desire of the populace to monitor how their taxes are spend for them and their compatriots (Collier, 2008, p. 42-46). Ironically, replacing resource-rich countries' autocratic with democratic structures alone might not help, as the now enabled electoral competition is not yet checked and balanced by legal and institutional restraints (Collier, 2008, p. 51).

4.1.2. Challenge 2: Macroeconomic Institutional Issues

Some authors suggest that natural resource wealth is counter-productive for good institutional development, as it rather leads to individual, short-term profit gain, nepotism and corruption. Resources, rather than being invested in national development, serve to extract rent from them, as is often the case when mining minerals. Local, national or international mining companies then work together with the government and focus on each other's possible incentives, instead of nationally beneficial distribution procedures of the extracted products and the expected profits. This process might include the whole political elite, with entire branches of public goods and finances being mismanaged or misallocated (Gilberthorpe and Papyrakis, 2015, p. 384; similarly Ross, 2012, p. 6).

Others link "boom-based" borrowing or investment cycles with institutional criticism: during resource-related price booms, governments are often tempted by the influx of money to rise their spending ceilings, which over time destroys public spending's rationality and control. During the inevitably following recessions, those excessive spending habits are even more difficult to reign in. Later inevitable spending cuts have less effect on the superfluous and wasteful sectors (for example the overemployment of diplomatic services, or national ceremonies) but rather on the socioeconomically vital ones (such as education,

transport, and other national key infrastructures). Even in worst-case scenarios of "boom-bust cycles" regularly shaking the national economy, lessons are still not properly learned and applied for the next cycle. As an example, when the world oil price plummeted in 1986, Nigeria (which during the early 1980s oil boom borrowed and spent at large, especially on corruption-laden projects) had ordinary citizens' living standards cut in half (Collier, 2008, pp. 40-41; Robinson, Torvik and Verdier, 2006, pp. 447, 450).

4.1.3. Challenge 3: Conflict and Violence

The literature relates countries' natural resources to internal conflicts or violence. Geographic location matters; for instance, on-shore oil has been observed to be more conducive to civil conflict than off-shore extraction, with low-income areas being more volatile than regions around the national income average (Gilberthorpe and Papyrakis, 2015, p. 385). The importance of ethnic diversity for resource-rich countries divides the literature: some sustain that ethnically rather heterogeneous countries are more endangered by, and prone to internal conflict than those that are ethnically more homogeneous (Gilberthorpe and Papyrakis, 2015, p. 385).

Others maintain that ethnic diversity itself is a comparatively weak indicator for the conflict potential of resource-rich countries, yet even they affirm that ethnic diversity is more problematic in autocratic countries, since the more diversity, the weaker or smaller the support base tends to be for autocrats, who typically depend on their own ethnic support groups, which in turn makes clashes between ethnic support bases both more frequent and violent. As an example given, Saddam Hussein's Baath Party, mostly composed of Sunni Muslims, came to dominate the majority of Iraq's Shiite Muslims and Kurds at the time (Collier, 2008, p. 49; similarly Robinson, Torvik and Verdier, 2006, p. 461).

4.2. Sociopolitical and Socioeconomic Solution Suggestions

4.2.1. Solution 1: Strengthening Institutions and Public Spending

The importance of institutions is stressed with data in the context of oil-rich Gulf states for the two decades from 1990 to 2009, combining recommendations for strong institutions with lower governmental and higher public services spending: "The poor quality of institutions and the large size of government consumption, both of which are possible symptoms of a resource curse, could explain the disappointing TFP [total factor productivity] growth" (Espinoza, Fayad and Prasad, 2013, p. 15).

Some authors connect institutional strength to the growth of services sectors and the GDP (gross domestic product), and appeal for investments in education to

foster national institutions and diversification. They show that while the service sectors in the Arab region have grown faster than the average GDP in the decade between 2000 and 2010, and slightly faster in the GCC (Gulf Cooperation Council) than in the rest of the Arab region (namely by 5.4%), those in East Asia and South Asia have grown at almost the double annual rate (by 9.5% and 8.3%, respectively). Based on this data, they compare the examples of Algeria, Saudi Arabia, Syria and Yemen with the positive example of Botswana, and conclude that resource-rich countries should strengthen their institutions, to prevent rent-seeking from their resource, and to diversify from it (Akacem and Cachanosky, 2017, pp. 7-8; Diop and de Melo, 2016, pp. 84-85, 100-101; Kararach and Odhiambo, 2017, p. 148; Lay and Mahmoud, 2005, p. 48; Snowdon and Vane, 2005, p. 654).

4.2.2. Solution 2: Investment in the Renewable Energy Sector

Sachs (2007: 179-180) suggests investing in alternative or renewable energy sources, above all for countries whose primary resource is still oil. He gives the country example of Chad, which on the one hand exports its limited oil reserves, on the other hand depends on the burning of biomass for its own energy needs.

This suggestion might work well for countries whose oil wealth provides them with capacities to invest in alternative energy forms, such as the United Arab Emirates. However, even against the background of this country's almost daily reports in its main national newspapers (such as *The National* or the *Khaleej Times*) about alternative energy plants or projects being opened or endorsed, its real policy implementations and scientific efficiency percentages concede the scientific fact that renewable energy sources, such as solar energy, still need time and scientific advancement to be full energetic and economic substitutes.

4.2.3. Solution 3: Democratic Restraints, or Checks and Balances

Some hold that sufficiently strong constraints on political misuse of power, above all, allow democracies to succeed both politically and economically. Such democratic checks and balances are for instance the rule of law, the separation of powers, freedom of expression, a free press, or an independent judiciary. Such political restraints or checks and balances are even more important in ethnically diverse societies, where electoral fair competition even more likely to be abandoned in favor of autocrats' own ethnic support groups. As an example, in 1979 ethnically diverse Nigeria had just returned from a decade of military dictatorship to democratic civilian rule, but since large-scale vote bribery had left it cash-depleted, it also reverted to unchecked political patronage and re-awarded public contracts at more than four times the original cost. By contrast, in 2003, after having again returned from fifteen years of military rule, it introduced an economically measurable requirement of checks and balances,

namely that public investment projects had to be tendered competitively, which immediately reduced their costs by 40% (Collier, 2008, pp. 46-50).

Two countries are often given as counter-examples of the resource curse, in that they have avoided its negative impacts: the first, Botswana, required that all public investment projects promised a minimum rate of return, evidenced by surplus funds accumulated in foreign assets; today it represents a very different pathway in terms of development studies and realities (Collier, 2008, p. 50; Kararach and Odhiambo, 2017, p. 148; Snowdon and Vane, 2005, p. 654). In Norway, oil-fueled growth did not disable or dilute democratic processes and institutions, but supported and strengthened them. Norway succeeded in terms of resource riches as well as checks and balances because it had acquired the checks before its oil wealth: democratic-political restraints and resource revenues fueled each other, resulting in the country's highest per-capita living standard worldwide (Collier, 2008, p. 50-51). Additionally, Norway was favored by its advanced infrastructure and educational system already being in place, and used its resource income to advance social and long-term financial services, for example pension accounts (Farthing and Kohl, 2014, p. 84; Sachs, 2007, pp. 179, 191).

4.2.4. Solution 4: Supporting Interventions and Empowering Charters

Recent literature considers altruistic military interventions not only in case of full-blown conflicts, but also when countries need support as their resource richness exposes them to internal conflict and aggression. The legal bases for such interventions would be internationally stipulated and nationally implemented rules and regulations. In practice, this would amount to a "charter for resource wealth", improving measures for certain industrial sectors, such as the Extractive Industries Transparency Initiative (Collier, 2008, p. 178). According to its homepage (https://eiti.org/), EITI "is a standard by which information on the oil, gas and mining industries is published…not a prescription for governance of the extractive sector, rather a tool that informs the way the sector is governed". Such international charters would be double-pronged: legitimizing and motivating advanced countries' interventions on behalf of less developed ones, but also providing reformers within those countries with tools, instruments and a reference framework when facing opposition, oppression or lack of appropriate governance, to rally support around their own policy proposals. While such charters might meet powerful resistance, and recent political and economic attempts at democratically reforming countries such as Iraq were mostly considered a failure, such legal frameworks and interventions would empower reform movements at least within countries of the world's "bottom billion" (Collier, 2008, p. 182; similarly with respect to EITI: Papyrakis, 2017, pp. 175-179; Papyrakis, Rieger and Gilberthorpe, 2017, pp. 295-298).

4.3. Macroeconomic Solution Suggestions

4.3.1. Solution 1: Cash Transfers

The technically simplest and most straightforward solution is to channel a country's resource rents directly to its population via "cash transfers". The literature (Moss, Lambert and Majerowicz, 2015, pp. 10-19) argues for this policy measure in that cash transfers allegedly:

1) Reduce chronic poverty and inequality,
2) Improve nutrition,
3) Increase school attendance and health clinic visits,
4) Ease disaster recovery,
5) Improve the social contract, and
6) Have a multiplier effect due to clear objectives and only provisional funding.

Yet others mount equally numerous and impressive arguments against the workability of cash transfers (Sachs, 20007, pp. 189-190), namely that:

1) Private investments cannot bear the load or the responsibility for public sector investments, for example basic infrastructure provisions for education, health, transport and power;
2) In countries where direct cash payments work, such as Brazil and Mexico, the corresponding most important elements of a basic infrastructure are already in place;
3) Even where cash payments work well, they are conditional to benefitting households showing sound educational and economic practices.

The latter opinion seems preferable, since cash payments would first need to overcome the political and practical challenges of calculating and allotting them fairly, after which their disbursement would still too closely resemble those earlier criticized autocratic financing procedures, with which they can be too easily confused, and correspondingly misused.

4.3.2. Solution 2: Good Governance and Fair Wealth Distribution

Good governance is considered such an important principle that some re-label the resource curse a "leadership curse", attributing the real problem to the good "governance of natural resources" (Al Ahmad Al Sabah, 2013, p. 49). Others define the root of the problem thus: "Political leaders who are more secure in office will be more likely to restrain spending during economic booms; leaders who are less secure will exercise less restraint" (Ross, 2012, pp. 216-217). One of the most recurrent demands is that of transparency in the use of resources and their revenues (Ross, 2012, p. 14). Sachs (2007, pp. 192-193) outlines key

principles of governmental, active commitment to good governance as fair, long-term, sustainable and transparent wealth distribution, namely:

1) Correctly assessing national income and fiscal revenues from the resource;
2) Publicizing and regularly revising the expected income flows;
3) Publicly explaining the specific fiscal flows associated with the resource earnings;
4) Transparently managing the high risks of resource price volatility and production;
5) Basing the budget on cautious assessments of future resource world prices;
6) Cautiously pledging future resource revenues to secure current borrowing;
7) Converting limited and depleting resources into long-term sustainable social benefits; and
8) Investing the resource earnings for long-term growth across generations.

4.3.3. Solution 3: Careful Macroeconomic Management

Focusing on long-term macroeconomic management of resource benefits, Sachs (2007, pp. 174-175) asks that the resulting income should enable the country to:

1) Improve living standards by enabling more public and private consumption;
2) Finance higher levels of investment, from resource income and resulting borrowings; and
3) Finance other core public goods, for instance infrastructure such as roads or power networks, or international assets for future pension payments.

Especially for investment and trade, Sachs (2007, pp. 173, 175-177) advises macroeconomic long-term strategy, stability and growth; across countries and resource sectors, resource earnings in low-income countries should be turned into, or at least assist:

1) Public goods, rather than increasing private consumption;
2) Public investments, based on an overall sound macroeconomic strategy;
3) Public investments in infrastructure, health, education, social security, and education; and
4) Macroeconomic stability, by ensuring overall price stability and avoiding abrupt spending cuts due to sudden worsening of credit terms.

4.3.4. Solution 4: Public Sector Investment for Private Sector Growth

Finally, Sachs (2007, p. 178) suggests using resource revenues for public sector investments that enable and stimulate private sector investments and gains. Benefitting the entire national economy, the resulting economic activity should:

1) Stimulate private investment and raises incomes;
2) Improve budgetary resources including non-oil income;

3) Increase chances to finance public goods through the overall economic spur; and
4) Compensate for losses in case of depletion of the resource, or a decline in its world price.

4.3.5. Solution 5: Foreign Development Aid and Trade Liberalization

Some suggest that foreign development aid should be used to help above all the *export* sector, such as by improving a country's sea port infrastructure. Such a measure would assist the country's exports (via the now for instance refurbished or modernized port) to become cheaper abroad and thus globally more competitive (Collier, 2008, p. 121). Correspondingly, foreign development aid could be used to focus specifically on the country's *import* sector, firstly because any financial aid automatically increases the demand and the ability to pay for much-needed imports, and secondly because, in the longer run, it also increases demands for, and expectations of such imports among both the national population and importers (Collier, 2008, p. 122). These two measures should be accompanied by trade liberalization in form of lower taxes imposed on imports, since only then the country's higher demand for those imports can avoid a concomitant appreciation of the country's exchange rate, which would be the consequence of high trade barriers to be paid for by foreign traders to bring their goods into the country (Collier, 2008, p. 163).

4.3.6. Solution 6: Export Diversification and Protectionist Trade Policy

Export diversification has long since been considered a key advice for a resource-rich but else poor country, especially when its resources center on one or two main products or "cash crops". Beyond this classical literature advice, such export diversification is now being recommended by recent literature hand in hand with a trade policy that provides that country, at least initially, with protection against developed nations, to break into global markets. While this recalls the "infant industry argument" of international trade, it seems to go against free trade principles. The difference is that such protectionist measures would not be taken unilaterally by the resource-rich country against a global free market, but in agreement and unison with the global trade community, as they are only supposed to encourage the country to take its first steps towards later full-fledged global competition (see, in less detail than here, Collier, 2008, p. 183).

4.3.7. Solution 7: Setting the Exchange Rate at the Industrial Equilibrium

Some of the most recent and sophisticated voices persistently reiterate their suggestion to avoid resource-rich countries' currency appreciations because of

their high export revenues: "The overevaluation of the exchange rate…is the fundamental obstacle that poor countries face in industrializing and developing" (Bresser-Pereira, Oreiro and Marconi, 2015, pp. 70, 71; similarly Boianovsky, 2012, p. 59). Yet international monetary policy over some of the recent years has demonstrated that even periodically under- or overvalued currencies, for example according to IMF External Sector Reports, have done well on the world market, albeit and arguably in part for different sets of reasons that might not directly apply to resource-rich but otherwise poor countries.

5. Conclusions

The World Bank summarized for a long-term study on global economic growth: "Successful management of a natural resource curse calls for a combination of policies and institutions. On the economic policy front…on the institutional front" (2005, p. 307). It seems that the literature, even after the quoted "two decades of intensive research", still provides isolated explanatory models, and equally isolated sociopolitical, socioeconomic and macroeconomic solution ideas. Missing are multipronged suggestions, and internationally coordinated and supervised action plans. This is even more surprising given that developed countries benefit manifold from improving economic standards and living conditions of less developed ones, just to mention gaining new trade partners and networks, or widening collaboration and influence spheres, or reducing own development aid burdens. The methodological contribution of this research, namely its multidisciplinary approach, thus also seems to correspond best to the problem's theoretical and practical multifaceted nature.

Against this background, the most promising solutions enable countries afflicted by the resource curse the greatest amount of internal autonomy and development with the greatest degree of external independence and collaboration. Thus the first sociopolitical and socioeconomic suggestion, of strengthening domestic institutions, is preferable to the fourth, outside military intervention, however benevolently intended. While the second suggestion, investments in renewable energy, is laudable for its planetary environmental care and sensitivity towards industrialization, it also presupposes the existence of strong institutions in the first place, which can decide and then act upon corresponding investments and projects. Hence unconditional support for the first and third solution suggestions, namely adding political restraints, or democratic checks and balances, promises the most solid foundation, on which the second suggestion, alternative energy, can be built if technically and financially feasible, whereas military interventions should be *ultima ratio*, only to be considered if the other three have failed.

Macroeconomically, the second and fourth solution suggestions, namely of good governance and fair wealth distribution as well as public sector investment for private sector growth, seem to link up with the sociopolitical solution

suggestions of strong institutions, public spending, and of democratic restraints and checks and balances: they can be imagined as forming a four-point square of legal, political, social and economic pillars within which an environment of trust for resource uses and profits, as well as national development strategies and long-term investments can grow and foster. The third macroeconomic solution suggestion, of careful macroeconomic management, could be an overarching principle to maintain the shape of that square, and those pillars in solid position.

On that basis, the fifth and sixth macroeconomic solution suggestions can supplement that core: foreign development aid is to be used preferably in merely complementary (additional) and subsidiary (secondary) mode, to be done without in the long run. Similarly to renewable energy investment, export diversification can be recommended once a country has reached levels of resource diversity and depth that allow it to compete on the world market without protectionist barriers. Finally, setting the exchange rate at the industrial equilibrium, although by many postulated as the decisive measure, seems rather the icing on the cake: with other solutions in place, it would almost automatically, and given the connectivity of the global financial markets, transparently follow the overarching request for honest and politically, economically and socially efficient macroeconomic management.

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MEASURING VALUE CREATION FOR BUSINESS DEVELOPMENT: THE VIEW OF EXECUTIVE MANAGERS

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Abstract

On the assumption that value creation can be characterized as an element of fundamental importance for the quality of management, this study aims to know, through exploratory research, the vision that managers have about the challenges that they face, and the processes adopted to accomplish it. The text begins with a literature review that covers different perspectives of value creation, its importance to business and the reasons and ways for its monitoring and evaluation, such as performance indicators for its management. Based on these references, we conducted a qualitative research, collecting data by means of in-depth semi-structured interviews with managers of companies from different market sectors and sizes operating in Brazil. The findings reveal that those managers are conscious of the importance in monitoring and measuring the effectiveness of value creation as a condition to sustain competitive advantages, but the use of metrics and indicators for this purpose is not frequent. This study is expected to contribute to the reflection on the benefits that the management of value creation may provide to organizations business development.

Keywords: Value Creation, Competitive Advantage, Performance Measurement.

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1. Introduction

The competitive process encourages organizations to continuously discover new resources, further uses for available resources, innovative technologies and original ways to meet the needs of their customers. Hayek (1978) proposes that business rivalry stimulates the discovery of new means to achieve specific ends. This view of Austrian School of Economics considers the market as a mechanism for discovery of not yet imagined possibilities, where the accounting of profits and losses contributes to align corporate knowledge to the fundamentals of the economy. According to Mises (2010), profits reveal to the entrepreneur that the consumers approve his initiatives; losses indicate their disapproval.

Thus, competitive dynamics promotes a rapprochement between theory and practice, provides a continuous development of knowledge, and guides the corporate action by application of a trial and error method, wherein the adopted solutions are, intuitively, means of ensuring that revenues are higher than costs (Hayek, 1978, Mises, 2010).

Araujo, Burgoyne, and Easterby-Smith (2001) note that the accelerated pace of change challenges organizations to promote innovative practices and so generate economic value higher than competitors, to gain and sustain competitive advantage.

Barney and Hesterly (2009) conceptualize economic value as the difference between the perceived benefits obtained by a client who buys products or services of a company and the total cost of these products or services. Therefore, the size of a company´s competitive advantage is determined by the economic value created additionally in comparison with competitors.

However, more than the value of the return on investment to shareholders, managers must create value for certain customer segments whose desires they intend to meet. Osterwalder and Pigneur (2013) consider that the value proposition is the reason why the customer prefers a company over its competitors since it fits his needs or solves his problems. The value proposition can add a set of benefits offered to the client, through an innovative offer, or even like other already existing ones in the market, but with additional attributes. This perspective considers that value can be created by ensuring customer satisfaction and enhancing the performance of products and services.

Expanding the scope of a company's value proposition, there are those who suggest the value of its social role. Porter and Kramer (2011) refer to the creation of social value, by promoting development and better conditions for society. It involves the adoption of policies and operational practices for the company's competitiveness and, at the same time, improvement of the community’s economic and social conditions.

Despite the diversity of conceptions about value and managerial actions for its creation, it is not common to find discussions about what and how to measure the actual delivery of the value proposed in business models.

Nevertheless, performance indicators, expressed in numbers or qualitative aspects, are fundamental for the implementation of strategies or their revision, with the frequency demanded by the dynamism of the market in which modern organizations act (Velimirović, Velimirović and Stanković, 2011). Kaplan and Norton (1997) point out the importance of measurement for managerial action, stating that what is not measured is

not managed. The system of indicators strongly affects the behavior of people within and outside the company. If a company wants to survive and thrive in the information age, it must use management systems, performance measurement strategies and derivatives capabilities (Kaplan and Norton, 1997).

Finally, organizational performance should be measured through indicators that make it possible to evaluate progress towards the established goals and targets (Opoku-Anokye and Tang, 2013). However, according to Pintzos, Matsas, and Chryssolouris (2012), the lack of semantic quality in the indicators is typical, which generates difficulties of interpretation, either in the evaluation of internal results of the organization or comparison with the external agents.

The context reveals that measuring value creation can be a key element in the quality of management in an organization. Despite this, there is an apparent gap in the knowledge of mechanisms dedicated to this purpose. This fact motivated the accomplishment of an exploratory research destined to know the vision of managers on the challenges that they face, and the processes used to guarantee the delivery of value proposed in the business model.

With this overall objective, the present article contains, in the subsequent section, a review of the literature concerning different perspectives for value creation, its importance to business performance, the reasons and means for its monitoring and measuring, and the performance indicators through which it can be managed. The following topics discuss the description of methodological procedures adopted, the presentation and analysis of results and the final considerations, with an interpretation of the findings and recommendations about steps to be taken in the future for the continuation of the study.

2. Different Perspectives of Value Creation in Business

The concept of value can be taken on different perspectives. When using the term value, it is necessary to contextualize which of these views it is referring to, even though, depending on the focus, there may be a specific meaning. An accounting-related reference, for example, involves calculating balances of existing accounts on a given date based on historical data, which may be different from the market value. Aspects such as inflation and the obsolescence curve might not appear on the composition of the value (Cerbasi, 2003).

On the other hand, there is not a single concept of market value. In the case of publicly traded companies, this value corresponds to the stock price in the market. According to Frezatti (2003), the market value calculated by this criterion represents an approximation and should be seen only as a reference in the case of a sale transaction, noting that the share price is affected by the supply and demand forces of the capital market. In addition, there can be prizes whose measurement is quite complicated.

There may also be influence of factors such as the expectation of future earnings flows, the degree of uncertainty and the discount rate adopted in calculating the present value of the projected results, influenced by the opportunity cost (Procianoy and Antunes, 2001). According to Sharpe, Alexander and Bailey (1995), another aspect to consider is the intrinsic value derived from future cash flows.

The literature on value creation, within the scope of the Administration, presents approaches that are complemented by considering different premises. One of them considers the precepts of agency theory, which addresses the issue of the diverse interests that move the actions of managers and investors of a business. According to this approach, the key role of managers is to make decisions that promote the creation of shareholder value (Friedman, 1970). Studies such as Copeland, Koller and Murrin (2002) and Stacey (2010) highlight the compelling character of the return obtained by the capital investment via generation of profits as an indicator of competitiveness and quality of management.

Also originated in the 1970s, the expanded view of customer value creation is sustained by the idea that it is this agent from which revenue comes. They are, in turn, building the profits of the business. Examples include the study of Zeithaml and Bitner (1988) which discusses the customer perception of price, quality, and value. Anderson, Fornell, and Lehmann (1994) evaluate clients' perception of value for their satisfaction, Woodruff, Schumann, and Gardial (1993) seek to understand the consumer's conception of value, and Churchill and Peter (2009) propose Marketing actions focused on creating value for the customer.

This predominant view in the 1970s was complemented by the emphasis given by authors such as Freeman (1984) to the expansion of the universe of interested and influential stakeholders in the results of the business. Stakeholder theory then emerges as a counterpoint to the view that focused on the value created for shareholders, extending it to issues of sustainability, especially the Brundtland Commission report (1987), which is a landmark designing the company as an integral part of a community that interacts in building joint results. The conception followed by Porter and Kramer (2011, p.1), with the proposal presented as a "big idea: creating shared value" holds that value must be created through "operational policies and practices that foster a company's competitiveness while simultaneously improving the economic and social conditions of the community in which the company operates."

Woodruff (1997) indicates the creation of value as a source of competitive advantage. Consistent with this conception much of the literature dedicated to the analysis of elements that lead to competitive advantages, as conditions for the survival and sustainability of the business. According to such design, the value creation logic happens to be a relevant factor in building competitive advantage for a given organization. This view considers the creation of strategic value as a condition for the company to conquer the preference of customers and consumers (Othman and Sheehan, 2011).

Prahalad, Krishnan and Serra (2008) understand that the ability to focus on new projects and to integrate into new teams, with the ability to disintegrate and reintegrate tasks, considering the changes and evolutions of reality, create significant value, making the organization stand out and gain competitive advantage by adjusting its internal processes to connect consumers and resources.

There are also conceptions that consider clients and consumers agents active in the construction of value by companies. Galvagno and Dalli (2014) view consumers as developers, or even actors of productive functions, such as participation in collaborative (open) innovation processes, or in consumer experience reports and observations. The consumer can then be considered as the protagonist of the process of value creation. So,

the focus of value creation turns to the relationship between consumer and business, which interact for "co-creation" of value (Prahalad and Ramaswamy, 2000, 2004a, 2004b, Vargo and Lusch, 2004, 2006, 2008, Ramaswamy, 2008, 2011, Payne, Storbacka, Frow, and Knox, 2009).

Regardless of the approach by which one considers the meaning of the term value, it is possible to understand that the creation of value represents an evolution of the value previously existing. According to Copeland and Others (2002), creating value represents a return higher than the opportunity cost of invested capital. That can be achieved by selecting strategies that maximize cash flows and economic profit.

In the next topic, we present a discussion about processes, resources, and capacities that can be considered as value drivers.

3. Dimensions of Value Creation

Designing strategies dedicated to value creation is a practice based on the assumption that value can be directed through interventionist management actions. That is the conception of McTaggart, Kontes, and Mankins (1994), according to which value drivers are processes and capabilities that enable the company to generate and sustain high-value strategies on an ongoing basis. For the authors, identifying these drivers allows an understanding of how to create and maximize value. This identification is equally important as a reference for decisions concerning priorities and optimized resource allocation (Copeland and Others, 2002).

Rappaport (2001) believes that value creation for the shareholder results from both management decisions and investment and financing decisions. Value drivers such as the sales growth rate, the operating profit margin and the income tax rate are directly influenced by management decisions related to the product portfolio, distribution, sales strategies, pricing policy, among others. Decisions to invest in installed capacity to production and inventories, in turn, can be considered as value drivers, such as investment in working capital and permanent assets. Similarly, financing decisions exert influence on drivers such as the cost and capital structure of the firm.

Barney and Hesterly (2009) consider the ability to generate higher economic value than competitors as a source of competitive advantage. These authors conceptualize economic value as the difference between the perceived benefits obtained by a client who buys products or services and how much it costs for him. Therefore, the size of a company's competitive advantage is the difference between the economic value that it can create and the one which the rivals do.

Up to this point, the conceptions of value creation studied uphold by the prism of economic market value, with focus on results from the management of assets. Other less tangible aspects consider optical, such as relationship assets, composed by the ability to create and develop relationships with partners such as customers, suppliers, shareholders and other stakeholders. From the results obtained through the management of contracts, commercial rights, trademarks, and patents it is possible to achieve value gains for the company.

A less tangible value is the one created through relationships with those who the company does business. Elements such as brand management, customer services, and other aspects of a business operation are interrelated to value composition (Low and Kalafut, 2003).

Richer (2000) considers that the value perceived by the customer in a service, product or brand can be noticed through the monetary returns generated for the company. Therefore, the importance of measuring the creation of value for the customer is indisputable. After all, given the importance that a buyer attributes to a product, service or brand, it is necessary to measure the return that this value generates for the company, as support for the decision to invest in shares that increase that amount.

In addition to the investment decision, there is a link between value creation and business results in terms of costs. Given the influence of costs on the value that an operation generates for the company, it can be considered that the quality of the relationship can directly impact its economic results. Research indicates that gaining new customers costs five to seven times more than keeping customers as usual, so customer loyalty and maintenance tend to increase profits because of reduced operating expenses (Galbreath, 2002).

In other words, the metrics that make it possible to evaluate performance regarding value creation have a close correlation with those that indicate the results from the financial perspective, so measures that link the results from marketing and sales actions to the economic return are recommended (Lehmann, 1997).

Larentis and Gastal (2004), highlight that this correlation applies not only to the evaluation of the economic result of the business but also in measuring the value to the client, which must be examined in conjunction with the financial performance. In this way, it is possible to uncover what are the best investment strategies and measure the returns obtained. For this to be possible, it is essential to find out which assets are valued by customers, and whether their needs and expectations have been fulfilled, to measure their satisfaction.

A model proposed by Seth (2001) establishes as necessary the analysis of five aspects: (1) What do the customers value? (2) Which are the most important among all dimensions of value that the customers desire? (3) To what extent are we offering the value that customers want? (4) What is the cause of our performance in essential dimensions of value? (5) What will the customers want in the future?

This measurement should be on a scale that specifies the value to the client, which may be heard through focus groups or interviews to identify the most important aspects. Focus groups generate "value items", in this step it is made a comparison of the value creation of the company before the competition, to identify what can be improved in the future to satisfy the desires of customers and stand out in the market.

The model in question, therefore, proposes a method to monitor business performance from the value created for the customer. Churchill and Peter (2009) point to the fact that monitoring the results of value creation is comprehensive and considers as many stakeholders as possible since they jointly influence the results achieved by the organization. Marketing must be turned to the value created considering the point of view of all stakeholders. For example:

> *[...] Customers may want golf clubs made of beryllium and copper alloy but working with this material can cause fatal illness in employees. Customers may want extremely low prices but offering them can lead to losses for homeowners and their lenders. Customers may want complete product lines with immediate delivery, but this may not be economically viable for suppliers and resellers (Churchill and Peter, 2009, p.14).*

Whereas in a complementary manner the different conceptions of value and its creation in business, a comprehensive system to allow measuring the value created and control the effectiveness of its delivery should contemplate various dimensions. From the conceptual models described above, it is understood that it is important and possible to adopt mechanisms to promote the management of value creation through actions that provide performance gains for organizations.

Aiming not to limit the study to a simple description of possibilities, a field research was conducted to know management practices that are based on the perspectives identified in the literature.

4. Methods

With exploratory purpose, the study followed the qualitative research method, counting on primary and secondary data. The primary data were obtained through in-depth semi-structured interviews with strategically-level leaders of organizations that were previously known and who were willing and interested in participating in the research and subsequently sharing the resulting information. The interviews were carried out with people considered prepared to provide the desired information and who presented, besides the availability and affinity with the subject, sufficient accessibility for the data collection to become viable.

To enable the triangulation procedure were considered secondary data available in newsletters, reports, interviews, and information displayed on the companies' website. In some cases, minute meetings, contractual documents, norms, and procedures were also analyzed, with the proper authorization of the participants.

The number of interviews was determined according to Johnson's (2002) recommendation, that the ideal quantity is one that the researcher judges sufficient to achieve the scope and even some of the informants who appear to have more considerable knowledge about a specific subject of a category. Thus, we have selected seven management professionals, as executives or entrepreneurs, in companies of varying sizes and market sectors operating in Brazil.

The first set of interviews encompasses five different small and medium-sized companies, in which it was sought to identify if there are awareness and attention to the importance of value creation and measurement mechanisms in its management philosophy. The subjects participating in this group are described in Table 1, which presents the profile of the interviewed subjects and the characteristics of the companies in which they work.

Table 1. Respondents profile – small businesses

Inter-viewed	Education	How long is in the company	Position	Area	Market	Employees	Annual Revenue Range (USD)
I1	Engineering	four years	Director	Sales	E-commerce	10	From 1 to 2 mi
I2	Marketing (MBA)	three years	Director	Marketing	Sports Marketing	10	Up to 1 mi
I3	Dentistry/ MBA	twelve years	CEO	Management	Means of payment	30	From 1 to 2 mi
I4	Journalism	ten years	Associated Director	Management	Internet Portal	20	From 1 to 2 mi
I5	Business Administration	five years	Director	Information Technology	Consulting	7	Up to 1 mi

Source: Research data

With the purpose of broadening the scope of the study, it was sought to know practices adopted by institutions that tend to present more complex management mechanisms and are committed to the accountability of different agents that integrate their governance systems. Thus, we also heard the opinion of professionals who work in management positions as executives of large companies, whose profiles and the characteristics of the companies in which they operate are presented in Table 2.

Table 2. Respondents profile – large sized businesses

Inter-viewed	Education	How long is in the company	Position	Area	Market	Employees	Annual Revenue Range (USD)
I6	Business Administration	six years	Manager	Management	Cosmetics	7 thousand	From 5 to 10 mi
I7	Business Administration/MBA	three years	Product Manager (SMB)	Sales	Internet	18,7 thousand	Over 10 mi

Source: Research data

Each one of them was interviewed at his workplace. The presentation of some excerpts from the interview, considered relevant to the achievement of the proposed objectives, preserves the identity of the interviewees, naming them by codes such as I1 (Interviewed subject No. 1), I2 (Interviewed subject No. 2), and so on.

For the treatment of the data, we used the method proposed by King (1998), so that the answers were interpreted through categorical content analysis, using the Template Analysis method, also known as Thematic Coding. Based on the conceptual model adopted as a reference for the research, a structure of categories to be used to classify the data obtained in the structure of the questions formulated as interview script was elaborated.

When conducting the interviews, it was observed that some of the codes assigned to certain categories or sub-categories established in the initial template were irrelevant, while others appeared with an expressive frequency of citations. Following the recommendation of King (1998), after a meticulous reading of the transcripts and the observation of codes relevant to the context of the research, we prepared the final

version of the template for interviews analysis. In this template were established four main categories of analysis: A - For whom to create and deliver value; B - Value creation logic; C - Dimensions of value creation; and D - Instruments for the evaluation and measurement of value creation.

The analysis of the interviews allowed the grouping of the references found in common themes, in a way that promoted its codification in thematic sub-categories that, grouped, formed the four categories of analysis preliminarily established. Table 3 shows the categories and subcategories considered.

5. Analysis

The main aspects on which the participants were questioned refer to the characteristics of the public for which it is intended to create and deliver value, the logic of creating value established in the business model, the dimensions of value creation for clients and other stakeholders and the instruments adopted to evaluate and measure value creation.

Table 3. Analysis categories and sub-categories

Category		Sub-category	
A	*For whom to create and deliver value*	A1	Clients' profile and what they value
		A2	Needs to satisfy and problems to solve
		A3	Other influential stakeholders and what they value
B	*Value creation logic*	B1	Products/services to each client segment
		B2	Actions to obtain the clients' preference and to retain them
		B3	Relationship channels and how they create value
		B4	Concern with the social conditions of the community
C	*Dimensions of value creation*	C1	Dimensions considered important regarding what customers most value
		C2	in what proportion the value desired by customers is actually being delivered by the company
		C3	how much the value desired by the other stakeholders is actually being delivered by the company
D	*Instruments for the evaluation and measurement of value creation*	D1	Return on investment indicators
		D2	Formal mechanisms for measurement of value delivered to customers
		D3	Means used to measure the value perceived by stakeholders

Source: The authors

Category A – For whom to create and deliver value - involves the profile of the company's customers, what they value, what needs to be addressed and problems to be solved, in addition to other stakeholders considered influential and what they value.

This category considers the assumptions of Woodruff and Others (1993) on the consumer's conception of value, and Churchill and Peter (2009), who find it appropriate to promote management actions focused on customer value creation.

In general, the Interviewed subjects demonstrate concern about the value that the client attributes to the satisfaction of their needs and resolution of their problems, as can be seen in some answers, such as:

> *[...] the main points they all value are increased sales conversion due to customer feedback and increased customer transparency (I1).*
>
> *[...] is what it needs to enter the market and we solve it by presenting the management model that shows where it can act (I2).*
>
> *The first problem I solve is to bring a payment service [...], and we get the solution. However, the most significant problem we address is the cash flow problem (I3).*
>
> *We seek to help these consumers or customers to invest their money in a way that will achieve a better result and thus, with the best result, spend more and increase their businesses (I7).*

It is possible to notice that when it comes to interpreting what customers value, there is a specific consideration of perceived value because of customer satisfaction, which is in line with the view of Anderson and Others (1994).

Some of the mentions of respondents are consistent with Zeithaml and Bitner (1988) and Woodruff and Others (1993), regarding the influence of aspects such as price, quality and value of the proposed solution in the value that the client attributes to what the company offers:

> *What they want is to be able actually to trust the e-commerce they are going to buy from, and that is precisely the purpose of my company (I1).*
>
> *[...] in the middle of these clients there are different profiles, where each one values a specific aspect of the service. Some show that their preference will be for a lower price, but there are those who explicitly choose to contract services for the quality offered (I2).*
>
> *They also value quality. In the case of customers who hire us as intermediaries for a content consultancy or advertisers, the important thing is the quality of delivery (I4).*
>
> *[...] how we work with specific solutions, this makes the customer consider more of the value of the solution we provide (I5).*

Based on the profile of the audiences that most influence the results of the company, the Interviewed subjects expressed themselves about other stakeholders who, besides the clients, are the target of value propositions. Mentioned examples are communication vehicles, research institutes, investors, governmental regulatory agents, as well as the employees:

> *Another audience is the press that I do not do much contact. Suppliers like IBOPE are also a public, and sports equipment companies are also important (I2).*
>
> *I spent a reasonable period with formal investors who did influence the company's guidelines. They have already left and given me greater comfort to work with. They influenced and not always positively (I3).*

> *I think it's the collaborator's public and the media. Employees value the differentials that the company offers, for example, benefits, daycare, relationship, care for people and diversity. The media is always very connected with the company, and there are always reports that reinforce our beliefs and values (I6).*
>
> *We also have governments, so it is important for governments, legislators, to understand [...] how it works so that they do not create laws that hurt the business ... that harm small businesses that depend on us to generate money, so this second audience is very important that we must deal with (I7).*

Those statements confirm the propositions found in stakeholder theory (Freeman, 1984; Brundtland Commission, 1987), and in the discussions on sustainability (Porter and Kramer, 2011), according to which value is created not only for the shareholder but also to other communities in which the companies are inserted.

Category B - Value creation logic - addresses aspects such as the products and services offered for each segment of clients, actions that are taken to obtain client's preference and loyalty, relationship channels and how they create value, as well as concern for social conditions of the community.

As for the actions to gain preference and fidelity, the Interviewed subjects affirm:

> *Investment in constant innovation, work tools, and relationship, always seeking to be close to the customer, prioritizing an excellent service (I1).*
>
> *[...] the customer feels much more comfortable with the humanized care, well-trained staff and this helps me to flow things differently. [...] what I do is to provide an excellent service to the customer and as he works with us for a more extended period, we will keep his loyalty by giving us a discount and reducing costs, this is what we are trying to do (I3).*
>
> *We seek to serve our large clients by developing a good job to build loyalty. For advertisers [...], we can propose actions together with the company, but they are personalized actions (I4).*
>
> *It is an ethical company and makes customers [...] believe in the mission of the organization, I think this generates loyalty (I6).*
>
> *[...] our way of being loyal can have a win-win relationship where the customer will have a result and so are we (I7).*

Such assertions reveal that there is an intention to create value as a strategy for competitive advantage (Woodruff, 1997; Othman and Sheehan, 2011), not only attracting new customers but also by interacting with current customers for co-creation of value, (Ramachandha and Ramaswamy, 2000, 2004a, 2004b, Vargo and Lush, 2004, 2006, 2008), Ramaswamy, 2008, 2011, Payne and Others, 2009).

We also note the concern with customer loyalty to further enhance the relationship quality, as Galbreath (2002) points out. Regarding the relationship channels, the interviews revealed that there is a search for ways that provide favorable conditions for value creation, considering the possibility of building it in a chain, adding the value of different links in the chain of relationships, as affirmed by Othman and Sheehan (2011). Some examples:

> *The channels we use are traditional, e-mail, Skype, and telephone, and we create value in these channels through [...] our company's performance reports [...] helping customers make decisions, [...] because the client wants to be sure that if something goes wrong or any doubt arises, he can always find us easily (I1).*
>
> *We have social networks with various channels of interaction with our audience as well. We use the inbound funnel to deliver the right information at the proper stage of the customer on their buying journey with us (I2).*
>
> *[...] he has an active SAC [...], we can talk to him real time. We use social media [...], and this generates value because the comments and conversations are visualized by other users, and today we have more than 100 thousand likes (I3).*
>
> *[...] the channels are e-mail, telephone, and a face-to-face meeting, but [...] the portal itself is the customer relationship channel as well as social media (Facebook, Twitter, and LinkedIn). They create value by appearing more, having greater visibility (I4).*
>
> *We have several channels of relationship with the end customer and our representatives, [...] there are these contacts, and we are very active in social networks. We are always recognized for the excellent service, and this is very strong (I6).*
>
> *We have several channels: from the reactive to the proactive and the service. [...] The way we generate value is helping customers create more results, and if they have more results, we have more investment, and we grow together (I7).*

Concerning the creation of value from benefits offered to the social conditions of the community, the answers show statements such as:

> *[...] we are part of BCTA today, which is a non-governmental entity maintained by the UN and several countries support and recognize companies that reach the eight-millennium goals. We were recognized for promoting financial inclusion (I3).*
>
> *[...] we have helped many professionals, we have contributed by offering free content to the internet professional (I4).*
>
> *The company has a lot of the vision of the surrounding communities and the Amazon. There are many projects and actions for the improvement of social conditions. There is an institute [...] that is separated from the business with a focus on education alone, with this we have a line focused on education and everything that we sell is reversed for these social actions (I6).*
>
> *[...] the way people help the most is by creating an avenue for people who want to start, [...] we succeed in creating opportunity and creating opportunity, you generate income, you create jobs, and you move the economy (I7).*

That is, the Interviewed subjects believe that their companies act to create social value. The company has operational policies and practices dedicated to its competitiveness, but at the same time, it improves the economic and social conditions of the community, which corresponds to Porter and Kramer's (2011) proposition.

Category C - Dimensions of value creation - encompasses the dimensions that respondents consider important about to what the client gives the most value and how much the value desired by customers and other stakeholders is being delivered by the company.

The interviews bring as illustrations some mentions about the dimensions of value creation. These results can provide references on which indicators would be important to measure the monetary values generated by the company and to consider the return on investment in customer value (Richers, 2000). Among the dimensions mentioned above, the most outstanding were the structure, proximity, and accessibility of the service, the quality of products and services, the image of the products regarding the concern with environmental sustainability and the simplicity of use, as exemplified by the following statements:

> *They look for constant contact with us, and they value a lot of the dedicated service, the proximity, and affection in the service to each of them. [...] We see a high degree of customer satisfaction (consumers), but we cannot measure this index (I1).*
>
> *[...] a guarantee structure that is the solution, but this for the customer is the wheel he is seeking for his car (I3).*
>
> *I believe it is quality delivery (I4).*
>
> *[...] products, business model and sustainability (I6).*
>
> *I think it is firstly a platform that is accessible to everyone, so it is not exclusive in the sense that you need such a massive investment [...]. So, we can generate business returns [...] (I7).*

It was also considered the creation of value for other stakeholders. For these, the main dimensions mentioned are the satisfaction of business partners, the quality of communication, the conditions offered to human resources, access to information about products and services and the clarity and transparency of the company in its interactions with the market. Examples are the following:

> *We can deliver enough value to banks and buyers (I3).*
>
> *Business model [...] profitable enough to invest in human resources with the objective of improving quality [...] (I4).*
>
> *[...] I believe that it could give clarity to all the public of the internal processes. We have the challenge of improving our communication process (I6).*
>
> *[...] the rulers understood how to use politics to communicate with voters through the platform, so it is a value they perceive, and we make many initiatives that also help [...] to understand small businesses and how to play a positive role for society (I7).*

Considering the statement of Richers (2000) about the need to measure the monetary values generated for the company and to consider the return on investment in customer value, the interviewees were asked to evaluate in which percentage they understood that the company delivered the value that your target audiences want. In the answers

obtained, none refers to precise metrics, but it stands out a notion that there is an opportunity to improve the performance of the company concerning the effective delivery of value:

> *About 80%. I believe that to reach 100% would be mainly investments in tool features (I1).*
>
> *We are currently delivering very little, [...] only 30%. There is a lack of better development of content production (I2).*
>
> *I don't consider 100%, I think it's about 80% and the 20% are tied to the increase of the economic ballast. My client would like to do the transaction, and the money to be released into his account on the same day. Technology is possible, but I don't have a financial structure for this. If I did that, my client would be super happy, but it's not an easy decision to take (I3).*
>
> *[...] I believe that is a high percentage, but we are not yet at 100% as there are opportunities for improvement in the processes, variety of products to suit all tastes (I6).*
>
> *[...] I think there's still quite a lot [...]. The US does not meet all our customers today [...], our product has a lot to improve to be simpler and so that everyone can have access and with this simplicity, resolve more customer problems [...]. We see that there's a gap there in which more people could be advertising since they have a business page (I7).*

The responses consider the assumptions of Low and Kalafut (2003) that elements such as brand management, customer services and other aspects of a business operation are interrelated to the composition of value. In general, these factors are present in the mentions of the interviewees. However, it is evident the absence of commitment to the measurement of the performance of the company about its value delivery proposal. According to Low and Kalafut (2003), both the higher and lower tangible elements should be measured using performance indicators. Therefore, we tried to understand how the interviewed subjects interpret their commitment to the monitoring of this performance, which was the fourth category of analysis (category D), presented below.

Category D - Instruments for the evaluation and measurement of value creation - refers to indicators of return on investments adopted, formal mechanisms to measure the value delivered to clients and the means used to measure the value perceived by stakeholders.

Concerning the means used by the company to measure the value perceived by the client, it is noticed that there is a predominance of intuitive evaluations and satisfaction surveys, without the use of metrics or data quantifiable with precision. The statements that illustrate this condition are:

> *We do not carry out any measurement or analysis of perceived value, it is more intuitive (I1).*
>
> *We research through e-mail. We use the Survey Monkey, and the staff responds well (I3).*
>
> *In the case of clients who hire us as intermediaries for a consulting or advertisers, the important thing is the quality of delivery (I4).*

We have frequent searches with our network [distribution] (I6).

The means are, mainly, in the Ad Manager, you can show there for any advertiser the result of what they are investing. Then, the Manager is a way to show to the client, in a self-service, he can see the results. For customers who have service, have attendance, we have as a plus an account manager which is a professional here who helps to show this effect and the investment and return connection (I7).

Looking ahead to the possibility that the evaluations were carried out in a predominantly subjective way, a specific question was included in the interview script about the existence of formal mechanisms (reports, performance indicators, scorecards) to know the value delivered to the company´s target-public. It also questioned what these arrangements would be. It was found, as expected, a significant difference between the mechanisms practiced by large and small companies.

In large companies, the maturity stage of the management structure and the commitment of the executive body to accountability in a more complex governance system, there are formal mechanisms dedicated to evaluating value creation. In small companies, however, although there is recognition of the importance of business success, as shown by the above statements, there are practically no metrics that allow the evaluation and conduct of the value creation process. That is evident in comments such as:

[...] We don't have yet anything formatted (I1).

No, currently we don't have that (I2).

We don't have that level of maturity (I3).

[...] It was good to talk about it. We are currently developing a performance appraisal system and choosing indicators. We will consider the importance of monitoring the delivery of value (I5).

In companies where there is a concern to follow the creation of value through formal indicators, there is also the monitoring of turnover as a natural indicator, through the evaluation of revenue evolution:

Yes, we have many measurement indicators. Today we have a system directed to the theme of the performance of all areas, which generates reports and feeds the processes (I6).

[...] we have enough metrics to understand the value that people create with their investment. [...] And we obviously monitor revenue, how it's going, and whether advertisers continue or stop advertising and what the evolution of advertisers is. What I would say is the primary way to see if it is generating value: if they stop investing, then it is not making value, and it is not working (I7).

Therefore, the conception of Richers (2000) is evidenced by the fact that the value perceived by the customer in a service, product or brand can be noticed using the monetary returns generated for the company. We also note Lehmann's (1997) proposal about the correlation between value creation and financial results from marketing and sales actions.

Based on Larentis and Gastal (2004), who understand that, given this correlation, the creation of value should be analyzed together with the financial performance, the Interviewed subjects were asked to question what control instruments the company uses to obtain the return on their investments. The answers indicate that, although it is not common to use tools explicitly dedicated to the monitoring of value creation, companies are concerned to monitor and control the economic and financial results of their business, using, therefore, measures such as return on investment (ROI), contribution margins and scorecards by business area:

> *We make a simple ROI calculation through spreadsheets. How much was invested in an initiative and how much it generated of results, however, this is something done in an early and punctual way, nothing formatted or structured (I1).*
>
> *We have a very specialized process of financial management. We use transactional and point-of-sale crossings, and we have that well-refined. As my product is money, I buy from the bank and see at the tip (I3).*
>
> *The company makes many follow-ups with controls/results. Some scorecards and indicators make this measurement (I6).*
>
> *We look at the margin of the company, so this is an important metric to see what we are generating over wages, servers, and facilities and what is the margin that the company then has in profit and which must continue producing this return, which is primary to keep the company's viability (I7).*

Thus, the research resulted in the identification of a set of conditions that surround the decision-making process of the participating organizations. Even with the recognition of the importance of value creation for the global economic-financial performance of the business, there is no evidence of the use of instruments for their specific monitoring and management.

The next section presents the discussion of the main research results and considerations about possible contributions and expected outcomes.

6. Conclusion

The decision-making process in companies includes activities that involve, cyclically, the analysis of the situation, the diagnosis in which alternatives of action are identified to seize opportunities and solve problems, from which strategies are formulated. In the sequence, the implementation takes place, which results are evidenced through a process of performance monitoring and measurement that makes possible control actions. From this point, a new similar cycle begins.

Monitoring and measuring are, therefore, essential elements of this cycle to keep developing and providing continuous improvements to organizational performance. Learning from the experiences and applying the knowledge thus assimilated to the increase of the management process are conditions that foster the qualitative development of the business. For this learning, it is essential to monitor performance, and to improve results continuously. That is, monitoring and measurement provide subsidies to the managerial action, identifying and evidencing the results obtained about the intended ones.

The basis of this process is the proposed business model. From the identification of opportunities in certain market segments, the value proposition to the public that composes these segments is defined.

The bibliographic research carried out in this study highlights the importance of creating value for the competitiveness of an organization. It presents different perspectives through which value creation is analyzed, its significance to the business, the reasons, and means for it to be monitored, measured and controlled and through which performance indicators it can be managed.

Questions formulated based on this reference were submitted, through interviews, to managers of companies of different segments and sizes. The answers reveal the awareness of these managers as to the importance and need to monitor and measure the active creation of value to different stakeholders as a condition to sustain competitive advantages.

However, this was not the only finding. In some of the companies participating in the research, it is not common to use metrics and indicators that allow this measurement, except those dedicated to financial results evaluation.

The limited number of participants is recognized as a limitation to the inference about the scope of the results. Despite this, as an exploratory approach, the research reveals that there are companies still lacking value creation measurement and evaluation systems, which may be a generalizable tendency.

With this study, we intend to contribute to the reflection on the benefits that could be provided to the performance of the organizations by development of mechanisms that allow that managerial action. Therefore, it is recommended to continue with the expansion of the sample space used here, including the application of the research to a substantial number of companies, to allow an understanding of what is in general occurring in the market.

Likewise, the contribution resulting from the proposal of a system dedicated to monitoring, measurement and evaluation of the companies' performance regarding value creation would be significant.

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