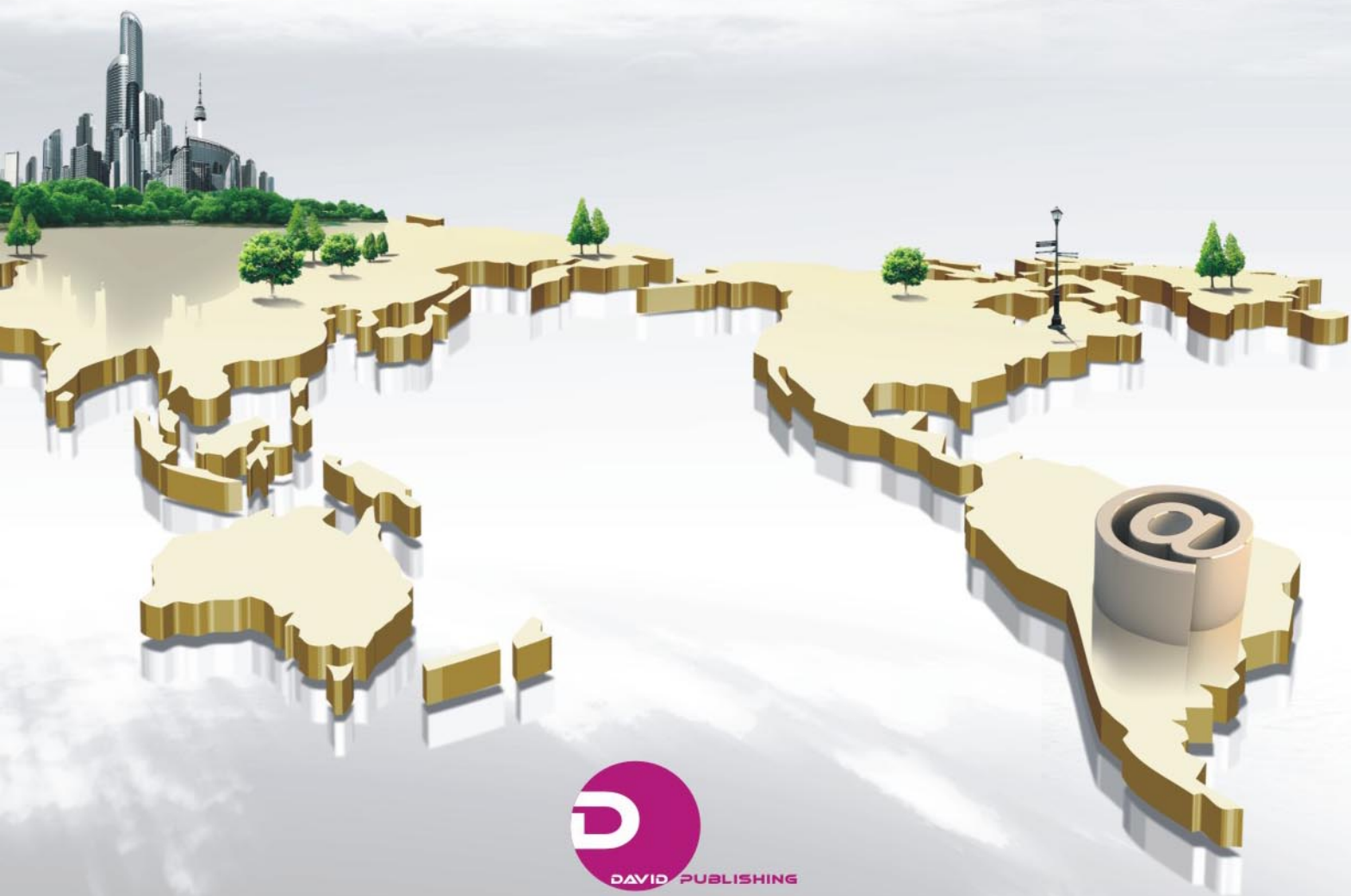


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The Impact of Crises on Youth Unemployment of Russian Regions: An Empirical Analysis

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The main purpose of this paper is to estimate the influence of the 1998 and 2008 crises on the youth unemployment rates (age class 20-29) in Russian regions. The investigation is founded on the panel data for 78 Russian regions during 1997-2008 provided by ROSSTAT (the main Russian State statistical organization). We compare the level and dynamics of the youth unemployment in various Russian regions and try to solve three main questions: Are there any special features of the youth unemployment in comparison with overall unemployment? How the 1998 crisis did change—and how the 2008 crisis is going to change—the youth unemployment dynamics? What can we learn from the impact of 1998 crisis and what is the main difference with the impact of the 2008 crisis? With the help of the obtained results we define some policy suggestions.

Keywords: financial crises, regional youth unemployment, Russian labour market

Introduction

In many countries, youth unemployment dramatically rose after the recent global economic crisis (ILO, 2010a; Arpaia & Curci, 2010; Choudhry, Marelli, & Signorelli, 2010)¹. The last crisis, started in 2007-2008 as financial crisis, led to the biggest recession (2008-2009) since the great depression of the 1930s, with widespread consequences in all countries around the world. The real effects of financial crisis (on production, income, expenditure, etc.) are always lagged². Considering the labour market consequences of the crisis, even longer lags exist.

It should be noted that, also in “good times” the integration of young people into the labour market is an important objective all over the world, due to the generally high and persisting youth unemployment rates. For example, in Europe, youth unemployment rates are generally more than twice as high as the adult rates, with significant differences across countries (Quintini, Martin, & Martin, 2007) and regions (Perugini & Signorelli, 2010a, 2010b).

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¹ The impact has been deeper on the weakest segments of the labour market, especially young people.

² It should be noted a remarkable shift (at the beginning of 2010)—more pronounced in some countries than others—from a financial crisis in the private sector to a fiscal (sovereign debt) crisis, because of large increases in public deficits, mainly as a consequences of GDP and revenue declines/accompanied by an increase in public expenditures.

The aim of this paper is to provide new econometric results on the youth labour market performance and dynamics of Russian regions, especially focusing on the impact of 1998 and 2008 crises.

The structure of the paper is the following. In section 2, the relevant literature review is distinguished into five sub-topics. The empirical evidence and results are presented in section 3, before a brief section of final remarks and policy implications.

Review of Literature

Considering the topic of the paper and the characteristic of the existing literature, we distinguish this part into five sub-sections. In fact, in the huge literature on labour markets, the topics regarding: (1) the youth segment; (2) the regional levels; and (3) the labour market impact of crises are generally considered separately. So, after a brief presentation of the definitions of “young people” adopted in the literature and a note on the better indicator between employment and unemployment rates, the second sub-section is dedicated to the “structural” determinants of youth unemployment rates (YURs) and the third one is devoted to key explanations of regional labour market performance, differences and dynamics. Then, after a review of the literature on the relationship between crisis and youth unemployment, in the final sub-section some key differences between 1998 and 2008 Russian crises are presented.

On the Definitions of “Young People” and the Better Youth Labour Market Performance Indicator

Although official statistics tend to focus on the group aged 15-24³, there is a considerable debate about the pros and cons of various definitions of youth and their consequences in the study of labour market performance and dynamics (e.g., Lefresne, 2003; O’Higgins, 1997). However, because of the larger data availability in the case of Russia, we shall use in our empirical estimates the 20-29 age class.

In general, employment rate indicators are better than unemployment rates, but this does not hold for “young people” considering the difficulties to take into account of the differences and changes in the “schooling participation”⁴. Obviously, in interpreting empirical evidence, it should be borne in mind that YURs are affected by all the problems related to general unemployment rates (in particular, the definition of unemployment and the role of discouragement effects)⁵. In addition, in the case of youth unemployment, some specific problems, such as underemployment and informal sector employment, may be particularly relevant (O’Higgins, 2005).

On the Structural Determinants of Youth Unemployment

As already highlighted in the section of introduction, the youth unemployment rate is generally higher than adult unemployment rate. According to the existing literature, many factors (including also the macroeconomic conditions and the set of labour market institutions) contribute to the youth labour market performance. It is well-known that unemployment, in general, depends significantly on macroeconomic cyclical conditions: however, macroeconomic performance and cyclical behaviour cannot explain many “persistent” employment difficulties of young people. The main reason of the generally worse youth labour market performance with respect to adults is related to the lower level (and/or different quality) of human capital (and productivity), which

³ As for a more complete definition of “youth unemployment” and some measurement aspects, see also ILO (2009). See also the empirical evidences presented in ILO (2010a, 2010b).

⁴ In other terms, a lower or/and decreasing youth employment rate is significantly related to high(er) “schooling participation”.

⁵ On this point, see Perugini and Signorelli 2004 and 2007.

ceteris paribus makes employers prefer adult people to young. The educational level is the most immediate variable measuring “human capital”, but young people lack the other two components of human capital, namely generic and job-specific work experience. From both a theoretical and an empirical viewpoint, Carmeci and Mauro (2003) have shown that educated youngsters need to acquire firm-specific knowledge by working activities for “schooling” human capital to become productive.

The links between the “institutional framework” and policies to contrast youth unemployment are discussed in a wide and recent literature (e.g., Brunello, Garibaldi, & Wasmer, 2007; Checchi, 2006; European Commission, 2008, chapter 5). The impact of the institutional settings has been previously stressed by many authors (e.g., Newmark & Wascher, 2004; Kolev & Saget, 2005; Bassanini & Duval, 2006). In particular, many authors have analysed the effects of temporary jobs (e.g., Booth, Francesconi, & Frank, 2002; Quintini & Martin, 2006) or of minimum wage regulations (e.g., Abowd et al., 1997, Neumark & Wascher, 1999). A part of the literature point on the role of temporary contracts in favouring the transition of young people to labour market (e.g., Ichino, Mealli, & Nannicini, 2005; Barbieri & Sestito, 2008; Picchio, 2008).

The school-to-work transition (STWT) processes and their changes over time have been widely investigated in the literature. Clark and Summers (1982) analyzed the determinants of the higher flows in and out of unemployment for young compared with adult people. The persistence of youth unemployment, initially considered by Heckman and Borjas (1980), is also the focus of Ryan (2001). Even macroeconomic variables, e.g., the labour demand level and relative wages (O’Higgins, 2005), may affect the school-to-work transition. As to the education systems in Europe, that can be classified according to their flexibility vs. rigidity and to their “dual” vs. “sequential” approach to training (Caroleo & Pastore, 2003, 2007), they determine, on the one hand, the “quality” of education and the performance of students and interact, on the other hand, with the STWT institution in influencing the youth labour market performance⁶.

Many other researches consider the human capital a prominent element in the explanation of the determinants of youth labour market performance (by considering the multiple features characterizing the transition of young people from school to the labour market, the risk of unemployment they face, their performance at work, the quality and stability of their positions). In particular, young people with low human capital and low skills are more exposed to long duration unemployment, to unstable and low quality jobs, perhaps to social exclusion (OECD, 2005). The microeconomic literature considers the educational choices as the optimal outcome of comparing the investment costs in education and the expected returns (probability to get a job, future incomes, better occupations and careers, social esteem, etc.). However, the decision of extending the study period and the choice of the type and level of school, as well as the final outcomes, depend also on the family (socio-economic and cultural) background. In fact, the participation to (different levels of) education is positively correlated, in all countries, with household background in terms of education and/or employment, with obvious effects in terms of social mobility; remarkable differences between countries exist and persist over time (Hertz et al., 2007); the objective of equal (or similar) educational and employment opportunities is far to be reached (e.g.,

⁶ Caroleo and Pastore (2007), arguing that the “youth experience gap” is a key factor in explaining youth unemployment, classify the EU countries into five groups (the North-European, the Continental European, the Anglo-Saxon, the South-European and that of new member states) according to the institutional setting and the mix of policy instruments (including various degrees and types of labour market flexibility), of educational and training systems, passive income support schemes and fiscal incentives.

Checchi, 2003; Brunello & Checchi, 2005).

An important cause of high youth unemployment and low quality employment—low entrance wages, bad-quality jobs, diffusion of non-standard labour contracts—has been found in the mismatch between the knowledge acquired through formal education and the skills required by the local/regional labour market. In general, the difference between educational supply and labour demand is in stronger connection to the performance of local economies than the level of educational stock itself (Rodriguez-Pose, 2003): A good level of formal education can have a limited impact on economic growth and performance if it is not suitable to the market needs. This is why the problem of an efficient—in terms of demand/supply match—investment in (higher) human capital and the measurement of (both private and social) returns on investment, e.g., in terms of increased labour productivity, is permanently in the agenda of the policymakers.

O'Higgins (2005) examines trends in the youth labour market in developing and transition countries, and highlights the main difficulties of integrating young people into “decent work”. He also stresses the importance of considering: (1) the “quality” of youth employment in terms of wages, weight of the informal sector, and underemployment; and (2) the existence of “state dependence” concerning the complex role of “child labour” (e.g., ILO, 2002) and the persistence of youth unemployment (e.g., Heckman & Borjas, 1980; Ryan, 2001). Other approaches explicitly focus on supply side aspects connected to the effects of demographic composition and changes, for example, Flaim (1990) shows the negative effect of the “baby boom” on unemployment rates; Shimer (1999) finds that a larger youth population share reduces the total unemployment rate and raises labour force participation by young people. Korenman and Neumark (1997) analyze the influence of the youth share of the population on youth unemployment, concluding that its role is overwhelmed by the effects of aggregate economic conditions.

On the Determinants of Regional Labour Market Performance and Differences

As to our knowledge, there are only few studies (Green, Owen, & Wilson, 2001; Perugini & Signorelli, 2010a, 2010b) investigating youth labour market performance at regional level (in the European context). The latter research highlighted also the following results: (1) the “unemployment problem” in the EU is especial and increasing due to youth unemployment; (2) the strong persistence over time of youth labour market performance; and (3) its clearcut spatial dependence. The second point should increase awareness that, if potential labour market weaknesses are left free to unfold, the price to be paid will be high for a long period of time; the other side of the coin is that policy efforts aimed at increasing labour market performance, if successful, may be able to produce durable outcomes, and this time pattern of benefits should be carefully considered when assessing the present costs of policy interventions. The third point (spatial autocorrelation), indicates that supra-regional aspects do matter in shaping labour market performance and that policy design should carefully consider the true spatial extent and interactions which take place at regional level.

Differently, a large literature exists in regional labour market, not specific for youth segment. As regards the determinants of differences and dynamics in EU regional labour markets, the literature generally distinguishes the two blocks of transition and old EU-15 countries⁷. Considering the empirical literature on transition

⁷ For the sake of brevity, here we just recall a part of the literature on transition European countries without considering the large literature on Western European countries.

countries⁸, part of the literature focuses on sigma and beta regional convergence. Boeri and Scarpetta (1996) show the large increase in regional labour market disparities, and others (e.g., Smith, 1998; Gorzelak, 1996; Petrakos, 1996; Römisch, 2003) present evidence of the sigma divergence of unemployment, wages, and GDP per capita in Central and Eastern European countries. Marelli (2004, 2007) considers both sigma and beta convergence in old-EU and new-EU (transition) countries. As regards the literature which also contains theoretical perspectives, Ferragina and Pastore (2006, 2008) present interesting surveys and results explaining the high and persistent disparities in regional unemployment rates in relation to the optimal speed of transition theory (Aghion & Blanchard, 1994; Boeri, 2000). Huber (2007) surveys the empirical literature on regional labour market development in transition, focusing on the evidence of increasing regional disparities and polarisation of capital cities and regions closer to EU borders. An additional survey on the “mystery” of regional labour market performance differentials can be found in Elhorst (2003). Some authors have highlighted the importance of regional differences in initial conditions: Scarpetta (1995) showed that transition negatively affected especially those regions on which planned economy concentrated most economic activities (particularly in the manufacturing sector); Gorzelak (1996) stressed the importance of geographic distance from the core of Europe. Other authors focus on the role of the degree of restructuring, affected by the depth and speed of reform processes: Newell and Pastore (2000) showed that, when unemployment is positively related to workers’ reallocation across regions, spatial unemployment differentials increase, the main reason being the different pace of industrial change. In order to explain regional unemployment, Boeri (2000) focused on the geographical immobility of workers, mainly caused by lack of housing in potential destination areas, and on the existence of wage rigidities. Similarly, Fidrmuc (2004) noted the scanty role of migration in reducing regional disparities in the CEECs. Many other authors have attempted to identify the complex mechanisms of regional labour market adjustment in transition (e.g., Bornhors & Commander, 2006; Huber, 2004; Gacs & Huber, 2005).

Finally, it should be noted, especially considering regions with quite different level of economic development (like Russian regions), the latter affects both total and youth unemployment rates.

As already noted—with few exceptions—in the existing literature the two subjects of youth and regional labour markets have generally been considered as separate topics.

On the Relationship Between Crisis and Youth Unemployment

The literature on the impact of “economic crises” on youth unemployment is still quite scarce.

First of all, it should be recalled that, the overall and specific impact on labour market of a crisis is usually different across (and within) countries depending on many factors, such as: (1) the economic structure; (2) the institutional framework (including STWT, i.e., the “school-to-work transition” institutions); and (3) the policymakers response at different levels⁹. The previous factors affect, in the first place, the size and the degree of (in)stability of the relationship between economic growth (or output decline) and unemployment rate, i.e., the

⁸ As shown by Kornai (1980, 1992), the situation before transition was characterised by a chronic labour shortage (over-employment with low productivity), especially in the most developed and industrialised CEECs. The same author (Kornai, 2006) also highlights the fact that unemployment emerging in the early stage of transition was largely unexpected in its main features (two-digit levels and wide regional differences). In addition, the initial (and optimistic) theoretical models of transition (e.g., Aghion & Blanchard, 1994) presumed, wrongly, that it would have only lasted a short time.

⁹ In many countries, policies are adopted—with different degrees of coordination and autonomy—in more than one level of government (see Signorelli, 2008).

so-called “Okun’s law”¹⁰. However, a decline in aggregate demand—as occurred in 2008-2009 in many countries—negatively affects labour demand, with different immediate responses (also as a consequence of labour hoarding practices), various time lags and different degrees of the persistence of the effects.

Considering the young people, Scarpetta, Sonnet and Manfredi (2010) highlighted that the crises exacerbate a number of structural problems that affect the transition from school to work. In fact, during and after a (financial and/or economic) crisis, the decline in GDP turns—after some months—into a reduction of labour demand¹¹: In this situation, school-leavers are competing with more jobseekers for fewer vacancies¹², while the youth already in the labour market are generally among the first to lose their jobs, mainly due to the higher diffusion of temporary contracts¹³, with a consequent high difficulty to get another one (OECD, 2009).¹⁴ The labour hoarding practices, especially in countries with the highest EPL on “permanent contracts”, favour adult segments and can further increase the size and duration of the impact of the crisis on youth unemployment.

It should be noted that, generally, “education matters” and the consequences of a crisis are usually more dramatic for low-skilled youth, already in great difficulties in good times, since the crisis further increases their risk of long-term inactivity and exclusion. Many authors find that a “scarring” effect of unemployment on youth depends on overall labour market conditions, but it is significantly higher for disadvantaged youth (e.g., Bell & Blanchflower, 2009). In any case, adopting the definitions of Quintini and Manfredi (2009), the crisis is pushing more and more youth, even those who have performed well in good times, into the group of “poorly-integrated new entrants” and possibly in to the group of “youth left behind”¹⁵. In particular, Scarpetta et al. (2010) highlight the risk to have a “lost generation” and the need to adopt effective (active and passive) labour policies and STWT institutions for minimizing the increase in the number of youth losing effective contact with labour market and permanently damaging their employment prospects.

Verick (2009) considers the effects on unemployment of the past “Big 5 Crises” (Spain, 1977; Norway, 1987; Finland, 1991; Sweden, 1991; Japan, 1992) in order to better investigate the impact of the recent crisis on the labour market, especially on young men and women. The author argues that data on the five previous financial crisis, as well as on the recent one, reveal that young people are hit hardest and the impact persist long

¹⁰ See Okun, 1962. For a discussion on the stability (and main direction of causality) of the output-unemployment relationship (Signorelli, 2005).

¹¹ Labour demand (at both firm and aggregate level) can be also distinguished in “desired” and “actual”, especially considering—together with other factors—the hiring and firing costs (also related to the labour hoarding strategies and to the evidence of co-existence of vacancies and unemployment). In addition, it should also be considered the partly different dynamics of labour demand if considered either in terms of “number of workers employed” or in terms of “overall number of hours worked”.

¹² As mentioned in the previous section, the existence of a “youth experience gap” favors a higher employability of adult (with generic and sector specific skills) with respect to youngsters.

¹³ The higher diffusion of temporary contracts between youngsters leads to the adoption of a sort of “last-in first out” rule.

¹⁴ So, the high diffusion of temporary contracts is a key explanation of the higher business-cycle sensitivity for youth in the labour market. However, many authors (e.g., Cockx & Picchio, 2009; Scarpetta et al., 2010) notice also that—for many youth—temporary contracts (especially apprenticeship) are more often a stepping stone to a permanent contract than a “trap”. The trap effect of temporary contracts seem to be higher in countries with a large difference in the stringency of regulations for permanent contracts (i.e., strict “employment protection legislation”, EPL) as compared to temporary (or other atypical) contracts.

¹⁵ According to Scarpetta et al. (2010), the size of the group of “youth left behind” can be proxied by the number of young people who are neither in employment, nor in education or training (NEET). This group represented 11% (on average) of 15-25-years-old in the OECD in 2007.

after the economy is growing again¹⁶; the size and persistence of the impact on youth unemployment depend on: (1) the degree of economic contraction; (2) the sectoral composition of employment prior to the crisis; and (3) the institutional structures. In particular, Verick (2009) further confirms that—during and after a severe recession—young people find increasingly difficult to both acquire a job as a new entrant in the labour market, especially as a consequence of hiring freezes, and to remain employed, since they are more likely to be laid off than workers with more seniority. So, the youth unemployment rates are more sensitive to the business cycle than witnessed for adult (OECD, 2008).

Arpaia and Curci (2010) produce a wide analysis of the labour market adjustments in EU-27 after the 2008-2009 recession (in terms of employment, unemployment, hours worked and wages) and they also highlight that workers with weaker work contracts and a lower qualification and experience have borne the brunt of the “great recession”, with a consequent huge increase in youth unemployment rates.

In a global perspective, according to ILO (2010b), youth unemployment rates (15-24) increased from 12.1 in 2008 to 13.0 in 2009, corresponding to an increase of more than 6 millions people, with significant differences across world regions. However, the impact on youth, as evidenced in ILO (2010b), is well beyond the unemployment indicator.

Considering the complex relationship between unemployment, employment and participation rates (see, for example, Perugini & Signorelli, 2004, 2007), it should be noted that—especially during and after a crisis—the increase in (youth and total) unemployment rates can undervalue the negative impact if the possible decrease in the (youth and total) participation rates is not adequately considered. This is the well known “discouragement effect” (usually more relevant for women) that produce a reduction of the actual labour force and—especially in the case of young people—can partly consist in an increase in the duration of “education”.

Finally, Choudhry et al. (2010) investigated the effect of financial crises on youth unemployment rates during the period 1980-2005 for a large number of countries (about 70) and obtained that crisis impact on youth unemployment rate is significant and robust and persist till five years after the crisis.

On Some Key Differences of the 1998 and 2008 Russian Crises

One of the main experts on the Russian labour market, Kapeliushnikov (2009) believes that the reaction of the Russian labour market to the negative shocks can be considered settled. There is not much reduction in employment but a reduction of working time due to the wide use of various forms of underemployment. This model is observed in the previous and the current crisis. If the previous crisis was structural and institutional (individual sectors such as trade and finance have grown and participants of labour market could switch to these sectors from, e.g., building construction), the current crisis is cyclical, and it struck simultaneously in all major sectors. The main difference of the present crisis from the previous one is that this crisis takes place in conditions of relatively low inflation. The main mechanism used by employers in the 1990s—impairment of earnings due to inflation at this time was completely blocked. In addition, since the last crisis has occurred formalization of labour relations and workers become harder to dismiss. All this enable the author to conclude that a sharp rise on unemployment in the Russian market is not expected.

¹⁶ Differently from previous crises, in the last crisis the young men have been particular affected, mainly due to the high proportion of young men in heavily impacted sectors.

The similar conclusion makes another expert of the Russian labor market Anna Lukiyanova. She stressed that if we compare the rate of unemployment in Russia and OECD countries (Lukiyanova, 2010), Russia in 2007—the beginning of 2008 was at average OECD level, but significantly lower than the EU as a whole. In summer 2008, the unemployment began rising in Russia and the EU. In the second half of 2009, the situation in Russia started to improve (opposite the situation in the OECD, EU and US). One of the interesting observations of the author consists in the fact that during a recession there was no increase in the relative unemployment of graduates. However, increased unemployment can be seen for a wider group—young people from 20 to 29 years.

Linz (2004, 2008) also observes the importance of age structure for the Russian labor market. Using Russian Longitudinal Monitoring Survey (RLMS) Phase II (rounds VI-XIII) she demonstrated that “workers become more concerned about the possibility of losing their jobs as they age, and only after age 42 do they begin to regain some confidence”.

For the analysis of unemployment in so great country as Russia, of course it is important to take into account regional specificities. As noted, for example, by Shilov (2009) “beyond this general development, however, one can observe substantial variation across regions. In 2005 the Moscow region evidently experienced an unemployment rate of only 1%, whereas the Dagestan region in the Northern Caucasus had unemployment as high as 22.6%. In 2005, the national median wage was roughly 230 USD per month, but regional monthly wages were 583 USD in the capital and 122 USD in Dagestan. Another important feature of the Russian labor market is low interregional mobility. About a third of Russian regions are actually locked in “poverty traps”, and even in other regions the effect creates significant obstacles. Russian regions may therefore be more plausibly considered isolated labor markets than U.S. regions”.

Data, Descriptive Evidences and Econometric Results

In this section, we present the characteristic of the data, some descriptive evidences and new econometric results.

Data and Model

We based our analysis on the panel of 78 Russian regions (see Appendix Table A1) during the period 1997-2008. The source of the data is ROSSTAT site (www.gks.ru) and ROSSTAT publications (Labour and employment in Russia, 1999, ..., 2009).

Our basic empirical models are:

$$Y_{it} = \mu + \beta_1 GDP_{it} + \beta_2 GDPGROWTH_{it}^2 + \beta_3 LessMIN_{it} + \beta_4 d1998 + \beta_5 d1999 + \beta_6 d2008 + \alpha_i + \varepsilon_{it}$$

where i and t are the number of a region and time, respectively, $i = 1, \dots, 78$, $t = 1997, \dots, 2008$, $\varepsilon_{it} \sim IID(0, \sigma_\varepsilon^2)$, α_i are constants for the fixed effects model and $\alpha_i \sim IID(0, \sigma_\alpha^2)$ for random effects model (we add dummy variables for corresponding Russian federal districts in random effects models).

We have used two sets of three dependent variables:

(1) The first set: $YUNEMPL_{it}$, $UNEMPL_{it}$ —official youth (in 20-29 age group) and total unemployment rate (according to the International Labor Organization methodology) in region i at time t , and there difference $UNDIF_{it}$.

Unfortunately, these data are available only ones in two years, $t = 1998, 2000, 2002, 2004, 2006, 2008$.

(2) The second set: $YOUNEMPLOYMENT_{it}$, $TOTALUNEMPL_{it}$ —the share of unemployment in 20-29 age group and in whole population region in region i at time t , and there difference $UNEMDIF_{it}$. These data are

available annually, $t = 1997, 1998, \dots, 2007, 2008$.

Our control variables include *GDPPP*—purchasing parity per capita GDP, *LESSMIN*—the percentage of total population in the region with incomes below the subsistence level, *GDPGROWTH2* for the first set and *GDPGROWTH* for the second set—biannual or annual growth. All these variables are a measure of regional economic development.

As we can see in Table A3 in Appendix that all Spearman's correlation coefficients of dependent and control variables are significantly different from zero, this shows a monotonic dependence.

Econometric Results

Table 1 contains the results of estimation of our basic fixed effects and random effects models for the first set of dependent variables. The results of estimation of models for the second set of dependent variables are shown in Table 2.

Table 1

Models for Official Unemployment Rate and Youth Unemployment Rate

| Dependent variable | YUNEMPL | | | UNEMPL | | | UNDF | | |
|--------------------------------|------------|------------|--------------------------|--------------|-------------|--------------------------|-----------|-----------|--------------------------|
| Number of model | Model 1.1 | Model 1.2 | Model 1.3 | Model 2.1 | Model 2.2 | Model 2.3 | Model 3.1 | Model 3.2 | Model 3.3 |
| Type of model | FE | RE | RE with regional dummies | FE | RE | RE with regional dummies | FE | RE | RE with regional dummies |
| Control variables | | | | | | | | | |
| GDPPP | -7.71e-06* | -7.65e-06* | -6.1e-06 | -7.64e-06*** | -7.4e-06*** | -6.55e-06*** | -6.27e-08 | -9.66e-07 | -7.19e-08 |
| GDPGROWTH2 | -0.020 | -0.018 | -0.026 | -0.009 | -0.009 | -0.013 | -0.01 | -0.002 | -0.01 |
| LESSMIN | 0.082*** | 0.138*** | 0.134*** | 0.069*** | 0.098*** | 0.096*** | 0.013 | 0.057*** | 0.048*** |
| d1998 | 7.366*** | 7.349*** | 7.25*** | 4.55*** | 4.54*** | 4.51*** | 2.81*** | 2.85*** | 2.74*** |
| d2008 | -0.309 | 0.432 | 0.228 | -0.146 | 0.213 | 0.103 | -0.162 | 0.533 | 0.32 |
| SOUTH | | | 10.79*** | | | 8.14*** | | | 2.54*** |
| SIBERIA | | | 3.62** | | | 2.93*** | | | 0.32 |
| Const | 11.414*** | 9.692*** | 1.07*** | 8.46*** | 7.56*** | 5.94*** | 2.94*** | 1.54*** | 1.39*** |
| Observation | 465 | | 465 | 465 | 465 | 465 | 465 | 465 | |
| Model significance | 70.01 | 345.84 | 433.39 | 85.58 | 414.16 | 499.45 | 17.14 | 105.81 | 150.09 |
| <i>p</i> -v | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| <i>F</i> -test that all FE = 0 | 12.38 | | | 19.49 | | | 2.14 | | |
| <i>p</i> -v | 0.000 | | | 0.000 | | | 0.000 | | |

Notes. * significant at 10%; ** significant at 5%; *** significant at 1%.

According the Hausman test in all cases fixed effects models are preferable. However, the signs of estimated coefficients and their significance are the same in fixed and random models, but models with random effects allow you to obtain estimates for the coefficients of unchanging factors, such as dummy variables for regions. Estimation of the random effects models with a set of regional dummies allowed us not only to catch the regional differences, but also test our models for stability. Inclusion of the new variables did not change signs and significance of the coefficients of other variables.

In all models, the signs of the coefficients of variables *GDPPP*, *GDPGROWTH*, *GDPGROWTH2* are

negative (insignificance of the GDPGROWTH2 coefficient may be result of multicollinearity) and the sign of LESSMIN coefficient is positive, i.e., in more economically developed regions the youth and total unemployment rates (and share) are lower.

Table 2

Models for Shares of General and Youth Unemployment in Whole Population and in 20-29 Age Group

| Dependent variable | YOUNEMPLOYMENT | | | TOTALUNEMPL | | | UNEMDIF | | |
|---|----------------|--------------|--------------------------|--------------|--------------|--------------------------|--------------|--------------|--------------------------|
| | Model 4.1 | Model 4.2 | Model 4.3 | Model 5.1 | Model 5.2 | Model 5.3 | Model 6.1 | Model 6.2 | Model 6.3 |
| Type of model | FE | RE | RE with regional dummies | FE | RE | RE with regional dummies | FE | RE | RE with regional dummies |
| Control variables | | | | | | | | | |
| GDP | -1.46e-05*** | -1.36e-05*** | -1.3e-05*** | -9.65e-06*** | -9.24e-06*** | -8.92e-06*** | -4.91e-06*** | -4.43e-06*** | -4.19e-06*** |
| GDPGROWTH | -0.047*** | -0.049*** | -0.053*** | -0.028*** | -0.029*** | -0.032*** | -0.017* | -0.017* | -0.02** |
| LESSMIN | 0.047*** | 0.076*** | 0.073*** | 0.023*** | 0.035*** | 0.034*** | 0.023*** | 0.043*** | 0.038*** |
| d1998 | 3.264*** | 3.213*** | 3.21*** | 1.83*** | 1.808*** | 1.808*** | 1.432*** | 1.412*** | 1.41*** |
| d1999 | 4.011*** | 3.734*** | 3.79*** | 2.42*** | 2.312*** | 2.335*** | 1.583*** | 1.399*** | 1.46*** |
| d2008 | 0.088 | 0.321 | 0.207 | 0.177 | 0.27 | 0.224 | -0.089 | 0.081 | -0.002 |
| SOUTH | | | 5.44*** | | | 4.26*** | | | 1.17*** |
| SIBERIA | | | 2.08*** | | | 1.73*** | | | 0.345 |
| Const | 9.61*** | 8.742*** | 7.67*** | 6.52*** | 6.16*** | 5.27*** | 3.091*** | 2.512*** | 2.41*** |
| Observation | 927 | 927 | 927 | 928 | 928 | 928 | 927 | 927 | |
| Model significance statistic | 100.15 | 614.5 | 697.07 | 114.59 | 678.23 | 757.08 | 41.53 | 304.39 | 332.46 |
| <i>p</i> -v | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| F-test that all FE = 0 | 13.89 | | | 26.94 | | | 3.2 | | |
| <i>p</i> -v | 0.000 | | | 0.000 | | | 0.000 | | |
| Breusch and Pagan Lagrangian Multiplier test chi2 | | 943.5 | 655.03 | | 1670.6 | 1344.44 | | 92.15 | 62.34 |
| <i>p</i> -v | | 0.000 | 0.000 | | 0.000 | 0.000 | | 0.000 | 0.000 |
| Hausman test chi2 | 101.99 | | | 1445.71 | | | 22.32 | | |
| <i>p</i> -v | 0.000 | | | 0.000 | | | 0.000 | | |

Notes. * significant at 10%; ** significant at 5%; *** significant at 1%.

In all models the coefficients of d2008 are insignificant, but the coefficients of d1998 and d1999 are significant and positive. Hence the 1998-1999 crisis had negative impact on youth and total unemployment, but the beginning of 2008 crisis had no impact on youth and total unemployment of 2008¹⁷. At the same, time positive and significant coefficients of variables d1998 and d1999 in models 3.1-3.3, 6.1-6.3 indicate that the impact of the first crisis on youth unemployment was more serious than in general case.

As noted above we included a set of regional dummy variables in random effects models and test the hypothesis about the possibility of removing the group of insignificant regional dummy variables. Positive and significant coefficients of the variables "SOUTH" and "SIBERIA" in models 1.3, 2.3, 4.3, 5.3 allow us to conclude that in South and Siberian districts youth and total unemployment are higher than in others. And in the

¹⁷ As for more complete results, we are waiting for the availability of the 2009 regional data.

South district during the 1998-1999 crisis the situation with youth unemployment was more serious than in other districts (as evidenced by a positive and significant coefficient for the variable “SOUTH” in models 3.3 and 6.3).

As we noted above, we didn't find out—with 2008 data—the impact of the beginning of the second crisis on youth and total unemployment. Unfortunately, we have no all necessary data for 2009. But according to the Federal State Statistics (see Figure 1 and Table 3) of the Russian Federation as a whole, we note that the second crisis has negatively affected the total and youth unemployment, and the impact on the youth unemployment was more serious.

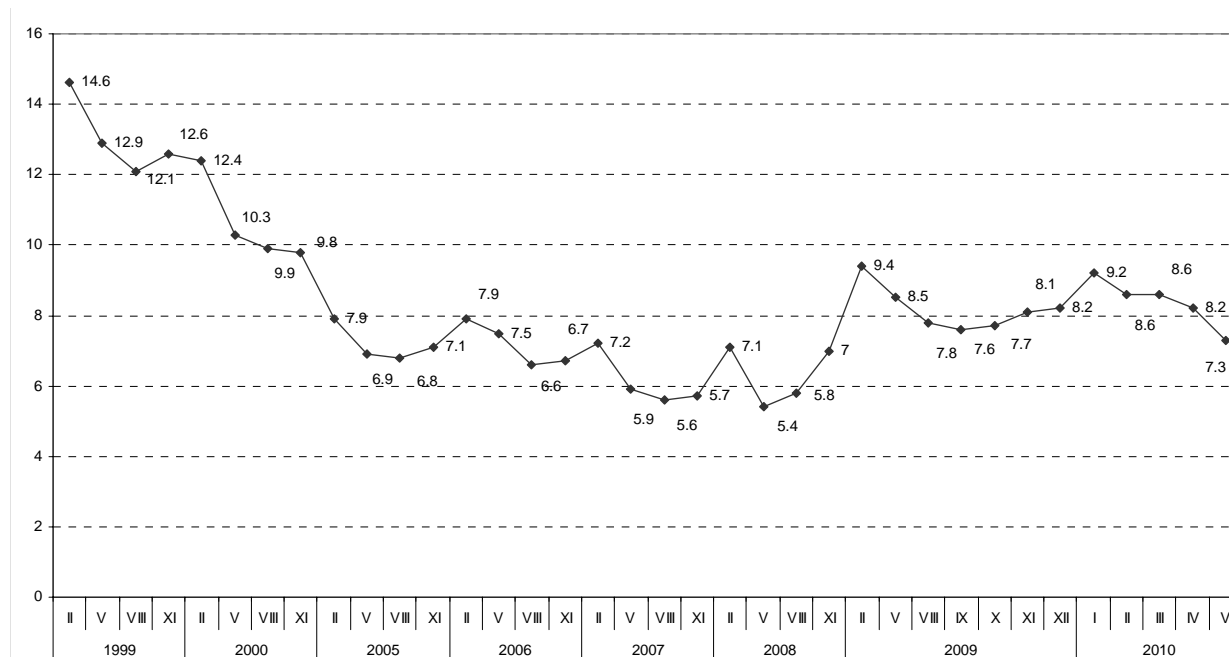


Figure 1. Unemployment rate in Russia (without seasonal correction). Source: Employment and unemployment in the Russian Federation, May 2010 (Follow-up surveys on employment) (<http://www.gks.ru>).

Table 3

Unemployment Rate by Age Groups in Russia

| Year | Total | Age | | | | | | | | | |
|------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| | | < 20 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | > 60 |
| 2000 | 9.8 | 27.6 | 16.2 | 10.6 | 9.5 | 9.3 | 8.4 | 7.2 | 6.1 | 7.1 | 6.2 |
| 2001 | 8.8 | 29.1 | 15.1 | 8.7 | 9.0 | 8.0 | 7.6 | 6.6 | 5.5 | 6.1 | 5.6 |
| 2002 | 8.5 | 27.8 | 14.3 | 8.8 | 8.6 | 7.4 | 7.0 | 6.3 | 6.2 | 5.5 | 5.6 |
| 2003 | 7.8 | 30.0 | 14.4 | 7.8 | 7.2 | 7.1 | 6.1 | 6.0 | 5.3 | 4.7 | 4.4 |
| 2004 | 7.9 | 32.1 | 13.8 | 7.6 | 6.9 | 7.3 | 6.4 | 6.4 | 5.9 | 4.7 | 5.3 |
| 2005 | 7.1 | 29.2 | 12.3 | 7.1 | 6.5 | 5.8 | 5.5 | 5.7 | 5.3 | 3.9 | 4.8 |
| 2006 | 6.7 | 27.8 | 14.2 | 7.2 | 5.0 | 5.8 | 5.0 | 5.7 | 4.7 | 3.7 | 2.7 |
| 2007 | 5.7 | 24.0 | 11.2 | 5.0 | 5.6 | 4.4 | 5.1 | 4.6 | 4.3 | 2.6 | 2.6 |
| 2008 | 7.0 | 30.9 | 12.9 | 6.5 | 6.6 | 5.8 | 5.4 | 5.1 | 5.4 | 4.6 | 4.7 |
| 2009 | 8.2 | 28.0 | 16.9 | 8.3 | 7.2 | 6.8 | 6.5 | 6.8 | 6.0 | 6.6 | 4.0 |

Notes. Source: Economically active population in Russia (based on sample survey). Statistical Bulletin, Moscow, 2010 (<http://www.gks.ru>).

Final Considerations

Youth labour market performance is extremely difficult to study due to interactions with schooling and many other reasons, highlighted by the literature reviewed in section 2.

In this paper, we obtained the following main results for Russian regions: (1) Descriptive evidence clearly highlighted the huge regional differences in terms of total and youth unemployment rates; (2) According to all models the higher the level of development of the region, the less the level of common and youth unemployment; (3) The consequences of the first crises (1998-1999) for youth unemployment are more serious than the consequences for general unemployment; (4) The problem of youth and total unemployment is more serious for South and Siberian federal districts; (5) During the 1998-1999 crisis periods the problem of youthful unemployment in southern district has become more aggravated; and (6) We did not discover the impact of the second crisis beginning (the year of 2008) on youth and general unemployment.

Waiting for the 2009 regional data (that will permit to complete the assessment of the last crisis impact), we can derive the following further preliminary consideration: It seems that—similarly to many other countries (like Germany, Italy and France)—“internal flexibility”, i.e., working time reductions (due to labour hoarding and underemployment), mitigate the impact of last crisis on total and youth unemployment rates in many Russian regions, but the recovery will be probably in several regions a “job-less recovery” with a low “new-hiring rate” that will particularly affect young people, i.e., youth unemployment rates will further increase and persist at high level. So, the monitoring of regional labour market dynamics is extremely important in order to better define general and specific economic and institutional policy interventions. In addition to counter cyclical economic policy measures—devoted to avoid that the creation of “Keynesian unemployment” will persist over time increasing the “structural unemployment”—effective national and regional development policies seem of crucial importance together with further improvements and integration of active and passive labour policies. We argue that the regional level—according to the best practices in many other countries—seems the more appropriate government level for active labour market policies.

Appropriate “active” policies are even more required, especially in regions where youth performance was awful even before the crisis. In this respect, also the improvement in the school-to-work transition institutions (e.g., placement services and educational and training activities) is of key importance. As for the “educational system”, a progressive shift towards an effective “dual and flexible” system seems appropriate in order to avoid that the “NEET generation” (Not in Employment or in Education or in Training) will expand.

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Appendix

Table A1

List of Russian Regions

| Russian federation | | | |
|--------------------|--------------------------|----|--------------------------------------|
| ID | Central federal district | ID | Privolzhsky (Volga) federal district |
| 1 | Belgorod region | 41 | Republic of Bashkortostan |
| 2 | Bryansk region | 42 | Republic of Marii El |
| 3 | Vladimir region | 43 | Republic of Mordovia |
| 4 | Voronezh region | 44 | Republic of Tatarstan |
| 5 | Ivanovo region | 45 | Republic of Udmurtia |
| 6 | Kaluga region | 46 | Republic of Chuvashia |
| 7 | Kostroma region | 47 | Perm territory |
| 8 | Kursk region | 48 | Kirov region |
| 9 | Lipetsk region | 49 | Nizhny Novgorod region |
| 10 | Moscow region | 50 | Orenburg region |
| 11 | Orel region | 51 | Penza region |
| 12 | Ryazan region | 52 | Samara region |
| 13 | Smolensk region | 53 | Saratov region |
| 14 | Tambov region | 54 | Ulyanovsk region |
| 15 | Tver region | | Ural federal district |
| 16 | Tula region | 55 | Kurgan region |
| 17 | Yaroslavl region | 56 | Sverdlovsk region |

(to be continued)

| | | | |
|----|-----------------------------------|----|-----------------------------|
| 18 | Moscow | 57 | Tumen region |
| | North West federal district | 58 | Chelyabinsk region |
| 19 | Republic of Karelia | | Siberian federal district |
| 20 | Republic of Komi | 59 | Republic of Altay |
| 21 | Arkhangelsk region | 60 | Republic of Buryatia |
| 22 | Vologda region | 61 | Republic of Tyva |
| 23 | Kaliningrad region | 62 | Republic of Khakassia |
| 24 | Leningrad region | 63 | Altay Territory |
| 25 | Murmansk region | 64 | Krasnoyarsk Territory |
| 26 | Novgorod region | 65 | Irkutsk region |
| 27 | Pskov region | 66 | Kemerovo region |
| 28 | Saint-Petersburg | 67 | Novosibirsk region |
| | South federal district | 68 | Omsk region |
| 29 | Republic of Adygea | 69 | Tomsk region |
| 30 | Republic of Dagestan | | Far East federal district |
| 31 | Republic of Ingushetia | 70 | Republic of Sakha (Yakutia) |
| 32 | Republic of Kabardino-Balkaria | 71 | Kamchatka territory |
| 33 | Republic of Kalmykia | 72 | Primorsky Territory |
| 34 | Republic of Karachaevo-Cherkessia | 73 | Khabarovsk Territory |
| 35 | Republic of Northen Osetia–Alania | 74 | Amur region |
| 36 | Krasnodar Territory | 75 | Magadan region |
| 37 | Stavropol Territory | 76 | Sakhalin region |
| 38 | Astrakhan region | 77 | Jewish autonomous area |
| 39 | Volgograd region | 78 | Chukotka autonomous area |
| 40 | Rostov region | | |

Table A2

Variables Description

| Variables | Definition | Comment |
|---------------------|---|--|
| Dependent variables | | |
| UNEMPL | The level of unemployment is determined as a ratio of the unemployed to the total number of economically active population, in percentage. | Official definition of unemployment rate. |
| YUNEMPL | The level of unemployment in 20-29 age group (is determined as a ratio of the unemployed in 20-29 age group to the total number of economically active population of the 20-29 age group, in percentage). | Official definition of 20-29 age group unemployment rate, data are available only at 1998, 2000, 2002, 2004, 2006, 2008 years. |
| UNDIF | The difference of unemployment in 20-29 age group and in whole population, in percentage. | We calculated this variable using the following formula: $UNDIF = YUNEMPL - UNEMPL$ |
| YOUNEMPLOYMENT | A ratio of the unemployed in 20-29 age group to the total number of population of the 20-29 age group, in percentage. | We calculated this variable using the following formula: $YOUNEMPLOYMENT = YOUTHUN^* UNEMPL * ACTIVITY / SHARE$ |
| TOTALUNEMPL | Total unemployment-a ratio of the unemployed to the total number of population, in percentage. | We calculated this variable using the following formula: $TOTALUNEMPL = UNEMPL * ACTIVITY / 100$ |
| UNEMDIF | The difference of unemployment shares in 20-29 age group and in whole population, in percentage. | We calculated this variable using the following formula: $UNEMDIF = YOUNEMPLOYMENT - TOTALUNEMPL$ |

(to be continued)

| Control variables | | |
|--|--|--|
| GDPGROWTH | A ratio of gross domestic product in the current year and in the previous one in percentage minus 100 percentages. | YEAR = 1998, 1999, ..., 2008 |
| GDPGROWTH2 | A ratio of gross domestic product in the current year and two years ago in percentage minus 100 percentages. | YEAR = 1998, 2000, ..., 2008 |
| GDPPP | Purchasing parity per capita GDP. | GDP per capita in the region divided by MINRATIO. |
| LESSMIN | The percentage of total population in the region with incomes below the subsistence level. | |
| CENTRAL, NORTHWEST, SOUTH, VOLGA, URAL, SIBERIA, FAREAST | Dummy variable for corresponding Russian Federal Districts. | |
| d1998, d1999, d2008 | Dummy variable for corresponding years. | |
| Auxiliary variables | | |
| YOUTHUN | A ratio of 20-29 age unemployed to the total number of unemployed, in percentage. | |
| ACTIVITY | Share of economically active population (labour force)-persons, which for the observed period are considered employed or unemployed. | The number of the economically active population includes data on employed and unemployed based on the results of surveys on employment of population. |
| SHARE | A ratio of 20-29 age group to 16-72 age group, in percentage. | |
| GDPpercap | GDP per capita in the region. | |
| MINRATIO | The ratio of subsistence minimum level in the region and in Russia as a whole. | |

Table A3

Spearman's Correlation Coefficients

| | YUNEMPL | UNEMPL | GDPPP | GDPGROWTH2 | LESSMIN |
|----------------|----------------|-------------|------------|------------|---------|
| YUNEMPL | 1.0000 | | | | |
| UNEMPL | 0.9209*** | 1.0000 | | | |
| GDPPP | -0.6508*** | -0.6873*** | 1.0000 | | |
| GDPGROWTH2 | -0.3409*** | -0.3297*** | 0.4330*** | 1.0000 | |
| LESSMIN | 0.5154*** | 0.5703*** | -0.7767*** | -0.1763*** | 1.0000 |
| | YOUNEMPLOYMENT | TOTALUNEMPL | GDPPP | GDPGROWTH | LESSMIN |
| YOUNEMPLOYMENT | 1.0000 | | | | |
| TOTALUNEMPL | 0.9326*** | 1.0000 | | | |
| GDPPP | -0.6939*** | -0.6615*** | 1.0000 | | |
| GDPGROWTH | -0.2697*** | -0.2552*** | 0.3568*** | 1.0000 | |
| LESSMIN | 0.5569*** | 0.5463*** | -0.7081*** | -0.0911*** | 1.0000 |

Note. *** *P*-*v* for the hypothesis H_0 : Spearman's $\rho = 0$ is less than 0.01.

Effects of Migration on Tax Policy in the EU Countries: An Empirical Analysis^{*}

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In this paper, we study whether migration affects taxes on labor and capital income. The analysis is based on panel data for 14 European countries. The results indicate that migration does affect subsequent tax rates, and taxes on labor income increase with increased migration, especially in countries with large public sectors. However, this effect is reduced for countries with large foreign trade and/or large shares of elderly in the population.

Keywords: migration, labor tax, capital tax, European Union

Introduction

The linkages between migration and economic policy are of growing importance in today's world. The integration of many Eastern European countries into the European Union has made this an important political issue, so has illegal and legal migration from Latin America to the USA, as well as from Africa to the European Union. In this paper, we examine whether migration has influenced tax policy in the European Union.

Linkages between migration and economic policy have been of interest to economists for a long time, and a number of theoretical studies have been made. However, the empirical research so far has largely focused on the determinants of migration, and the linkages from various policies to migration, rather than on the linkages from migration to other policies. Moreover, although links between migration and tax policy have been explored in a number of theoretical studies, there has been little empirical work on those links.

Despite the limited empirical evidence, concerns about the economic impacts of migration have featured prominently in the political debate in many countries. During the economic crisis in the 1970s, concern that immigrants would compete with native workers for jobs led to more restrictive immigration policies throughout the Western world. This concern was followed by a concern that immigrants were over-utilizing the welfare systems compared to the population in general. With the expansion of the European Union, both concerns have featured at the same time. Concerns that the welfare systems of western Europe would be overwhelmed by welfare seekers from the new member countries and lead to higher taxes or lower benefits, and/or that low wage

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labor from the east would compete for employment with the native workers and cause higher unemployment, caused many of the older EU members to impose restrictions on immigration from the new member countries. Experiences from those countries that did not impose restrictions suggest that the fear of increased unemployment was exaggerated, however, impacts on the tax systems of the recipient countries remain an unexplored issue.

While it is too early to systematically evaluate the effects of the post-enlargement immigration on the tax systems of the recipient countries, many of these countries have been net recipients of immigrants for extended periods of time. Thus, it is possible to use data on earlier migration to see what the earlier impacts of migration on tax policy have been.

In this paper, we use a panel of 14 European countries in order to study whether policymakers have considered the impacts of migration when setting labor and capital taxes. Our results suggest that migration has indeed been linked to higher tax rates on labor income, especially in countries with large public sectors. However, we also find that this effect is offset for countries where a large portion of the population is elderly and for countries with large foreign trade. We find little indication that migration has been linked to changes in taxes on capital income.

Previous Literature

Links between economic policy and migration have been discussed at length, both in the academic literature and in the political debate, although the main focus has often been on public good provision and on redistributive policies rather than on taxation. Hicks (1932) shows that income differentials, implicitly, net income differentials will encourage migration from low income to high income localities. Tiebout (1956) shows that migration can function as a means of generating a more efficient provision of local public goods, as citizens can move to the localities with the public good provision closest to their own preferences. Todaro (1969) and Harris and Todaro (1970) study migration within poor countries and show that differences in expected wage outcomes can lead to migration even to areas where unemployment is higher than in the area of origin.

Tax competition for capital and/or labor has been studied theoretically in a large number of papers (see e.g., Wilson, 1980, 1982, 1992, 1995, 1999; Bucovetsky & Wilson, 1991; Wildasin, 1991; Boadway, Marchand, & Vigneault, 1998; Andersen, 2005; Simula & Trannoy, 2006; Backlund, Sjögren, & Stage, 2008). Impacts of migration on economic policy other than taxation have also been modeled, Razin, Sadka and Swagel (2002) and Boerner and Uebelmesser (2007) show that migration can lead to changes in distributional policies, both through changes in the voting population and through changes in the tax base, although the two studies reach different conclusions about the likely direction of these changes.

In empirical studies, the determinants of migration have often been of greater interest to analysts than its impacts. Mincer (1978) studies the importance of family ties for the decision to migrate, and Ghatak, Levine and Price (1996) provide an overview of empirical studies of the Harris-Todaro model as well as extensions to the original model. Several authors have studied to what extent differences in economic policy act as drivers for migration (see e.g., Day & Winer, 2006; Ashby, 2007, for recent examples), and impacts of migration on the migrants themselves have been studied (see e.g., Borjas, 1987, 1989, 1994). However, empirical studies on the effects of taxation on migration are still very rare. One of the few exceptions is Liebig and Sousa-Poza (2006)

who use Swiss panel data to analyze the impact of an agent's tax burden on his/her migration decision.

From the theoretical literature, we know that tax rates and other aspects of public policy may be influenced by migration, but such effects remain largely unexplored in the empirical literature. Razin et al. (2002) attempted to examine empirically whether their model of migration's impacts on voting preferences holds in practice, one of the few studies to look at the empirical impacts of migration on economic policy. Another such study is the one by Armenter and Ortega (2007), who find that internal US migration has led to convergence in state level tax rates but do not find any indication either of a race to the bottom in tax rates, or of convergence in state distributional policies. Other than these two studies, little has been done empirically on the impacts of migration on public policy. Our paper therefore contributes to filling an important gap in the existing literature.

Model and Econometric Specification

Consider a world economy made up of H countries, and where each country is made up of mobile residents, immobile firms and a government. Each agent lives for T time periods and in any time period there are T generations alive. Within each cohort, there is heterogeneity, since agents may differ in terms of their migration history. We will therefore refer to generation type when we talk about a group of agents who have the same migration history within a generation.

In each time period t , an agent belonging to generation type nm , where n refers to the time period when the agent was born and m refers to an agent with migration history $m \in M_n$, where M_n is the set of all possible migration histories in generation n , derives utility from consumption, c_t^{nm} , and leisure, z_t^{nm} . The instantaneous utility function is written $u_t^{nm} = u(c_t^{nm}, z_t^{nm})$, and it is increasing and concave in both arguments. In each period t , an agent decides whether or not to emigrate, at the end of the period. The decision rule for this is as follows. If the agent decides not to emigrate, his/her future utility is given by the value function V_{t+1}^{nm} . On the other hand, if the agent chooses to emigrate at the end of period t , his/her future utility is given by $V_{t+1}^{*nm} - q^{jnm}$, where the superindex "*" denotes a "foreign" variable and where q^{jnm} is a utility cost of migrating, due to, e.g., home attachment. This cost is agent specific (the superindex j varies between agents), and is assumed to have a known distribution within generation type nm . Then, if $V_{t+1}^{*nm} - q^{jnm} \geq V_{t+1}^{nm}$, an agent emigrates at the end of period t .

For the government, we assume for simplicity that during each time period t , the government aims to maximize the utility of the electorate within that time period. This means that we can write the government's objective function in period t as a general welfare function $W_t = W_t[V^{nm}(\Omega_t, \Phi_t)]$.

The government budget constraint is given by $\tau_t w_t l_t^{nm} N_t^{nm} + \theta_t r_t K_t - R = 0$, where τ_t and θ_t are the tax rates on labor and capital, w_t is the hourly wage rate, l_t^{nm} is the amount of labour supplied per worker, N_t^{nm} is the number of workers, r_t is the rate of return on capital, K_t is the capital stock, R is a fixed revenue constraint, and where we also assume that there is a constraint on government borrowing¹.

The type and amount of labor available at time t will thus be determined by historical migration. Observe, however, that this specification of the model means that the government will not treat migration as an endogenous variable. The reason is that only historical migration influences the tax base for labor in period t , and since the government only maximizes the welfare during time period t , it does not take into account that its decisions will

¹ The IMF monitored member country borrowing in the early part of the period studied, and the EU stability and growth pact currently regulates borrowing among most of the countries in our dataset.

influence future migration. This is intended to model the actual policy debate in the affected countries during this period. None of the countries involved explicitly set tax rates in order to encourage or discourage migration during most of this period; the current and future migration was largely targeted directly through changes in migration policies, and the policy debate centered around the impact that the already existing stock of migrants had on government finances.

Maximizing the government's objective function w.r.t. τ_t and θ_t defines the optimal tax rates as functions of historical migration, i.e., $\tau_t = \tau_t(M_{t-1}^{nm}, M_{t-1}^{*nm})$ and $\theta_t = \theta_t(M_{t-1}^{nm}, M_{t-1}^{*nm})$. From this model, we would expect that immigration to the country in period $t-1$ will lead to lower tax rates in period t , and immigration will increase the tax base and make it easier for the country to meet its revenue goal, making it possible to reduce the tax rates on labor and capital income.

To study the impact of migration on tax policy empirically, the following equations are estimated:

$$\tau_{it} = \beta_0^l + \beta_1^l mig_{it-1} + \beta_2^l une_{it-1} + \beta_3^l gov_{it-1} + \beta_4^l open_{it-1} + \beta_5^l left_{it-1} + \beta_6^l old_{it-1} + \beta_7^l mig_{it-1} une_{it-1} + \beta_8^l mig_{it-1} gov_{it-1} + \beta_9^l mig_{it-1} open_{it-1} + \beta_{10}^l mig_{it-1} left_{it-1} \quad (1)$$

$$\theta_{it} = \beta_0^c + \beta_1^c mig_{it-1} + \beta_2^c une_{it-1} + \beta_3^c gov_{it-1} + \beta_4^c open_{it-1} + \beta_5^c left_{it-1} + \beta_6^c old_{it-1} + \beta_7^c mig_{it-1} une_{it-1} + \beta_8^c mig_{it-1} gov_{it-1} + \beta_9^c mig_{it-1} open_{it-1} + \beta_{10}^c mig_{it-1} left_{it-1} + \beta_{11}^c mig_{it-1} old_{it-1} + \varepsilon \quad (2)$$

where τ_{it} and θ_{it} are the tax rates on labor and capital, respectively, in country i at time t . In general, we assume that the response of the taxes to a change in the economic structure is not immediate. As such, the key explanatory variable, net per capita immigration mig_{it-1} , is introduced with a lag in the regression equations.

Turning to the other explanatory variables, we include the level of unemployment at time $t-1$, une_{it-1} , as a proxy for factors outside the control of the government which affects the labor market. These shocks may, in turn, influence the tax base for labor and thereby also affect the government's tax policy.

Government expenditure is also included as a possible determinant of taxes. This requires some motivation. In the public economics literature, public expenditure is usually determined jointly with the taxes and as such they are both endogenous variables. However, at a given point in time t , the level of expenditure may also be determined by factors that are outside the control of the government at time t (e.g., earlier borrowing or earlier political commitments which influence current expenditure). As a proxy for this, we include the lag of government expenditure divided by GDP, gov_{it-1} , in the regressions.

We also want to control for globalization by incorporating an indicator of how open an economy is to the rest of the world. Following earlier research, we use the ratio of exports plus imports relative to GDP as an indicator for openness, denoted $open_{it}$. In line with earlier research, we also want to include an indicator for political preferences. The traditional hypothesis is that left-wing governments have preferences for a large public sector which may result in higher tax rates. This is captured by the variable $left_{it}$ which takes the value 1 if left wing parties are in majority in the parliament and zero otherwise. To control for the age structure of the population, we include the fraction of the population over 65 years at time $t-1$ in the regressions.

Since migration may influence the economy through interactions with other variables, we also include interaction terms for all the discussed variables with migration. Finally, we include country fixed effects and an error term which is independently and normally distributed with a constant variance.

Data

To estimate the model, we use an unbalanced panel over the time period 1964-1996 which includes 14 European countries². To obtain data for the dependent variables, we follow the approach used by Mendoza et al. (1994) to calculate effective tax rates on labor and capital income for the relevant time period³. Data for the explanatory variables are collected from the OECD Statistical Compendium and from Eurostat. Table 1 presents some descriptive statistics.

Table 1

Descriptive Statistics

| Variable | Mean | Std. Dev. | Min. | Max. |
|--------------------------------|-----------|-----------|------------|-----------|
| Labor tax rate | 0.360022 | 0.0936314 | 0.1027612 | 0.5685341 |
| Capital tax rate | 0.2953312 | 0.1456671 | 0.0696927 | 0.7356118 |
| Unemployment | 0.0558654 | 0.0463281 | 0.00003 | 0.23662 |
| Openness | 0.5904173 | 0.248424 | 0.13341 | 1.472667 |
| Left wing majority | 0.3324176 | 0.4717282 | 0 | 1 |
| Elderly as share of population | 0.1327995 | 0.0207331 | 0.078 | 0.178 |
| Govt. exp. as share of GDP | 0.1895418 | 0.0474283 | 0.0783826 | 0.2942448 |
| Net immigr. as share of pop | 0.0007402 | 0.0029417 | -0.0121142 | 0.009962 |
| <i>N</i> = 364 | | | | |

Notes. Tax rates reported for 1965-1996, and other variables reported for 1964-1995.

From Table 1, we see that the average labor tax rate, and its standard deviation, is higher than that of the capital tax rate. Net immigration as a share of population is on average almost zero, but there is some variation between countries and over time, respectively. As for the level of unemployment, it varies considerably over time and between countries. This reflects the different labor market histories experienced by the countries in this time period. As for the globalization measure, which is the ratio of exports plus imports divided by GDP, Table 1 indicates that most countries are relatively open in terms of this measure.

Turning to the political indicator, it is a dummy variable which takes the value one if left-wing parties together have 50 percent or more of the seats in the parliament. As indicated in Table 1, it shows a relatively large variation. The data for this variable is collected from Armingeon, Leimgruber, Beyeler and Menegale (2008). Finally, we include that the ratio of total population over 65. As indicated in Table 1, it varies significantly between countries and over time. The data for this variable is also collected from Armingeon et al. (2008).

Results

A Wooldridge test for serial correlation in panel data was carried out and indicated the existence of serial correlation. The models presented in the previous section were therefore estimated using generalized least squares. The results for labor taxes are presented in Table 2.

² Austria, Belgium, Denmark, Finland, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom. Other members of the European Union and the European Economic Space were excluded because not all variables were reported according to the same criteria for these countries.

³ An alternative set of tax rate data has been compiled by Carey and Tchilinguirian (2000), who use the same method as Mendoza but use different sources, leading to slightly different tax rates. The results using the Carey data are similar to those using the Mendoza data.

Table 2

Tax on Labor

| | Coefficient | Std. Err. | <i>z</i> | <i>P</i> > <i>z</i> |
|------------------------|-------------|-----------|----------|---------------------|
| Net immigration | 7.092143 | 3.928429 | 1.81 | 0.071 |
| Unemployment | 0.2221374 | 0.0690274 | 3.22 | 0.001 |
| Government expenditure | 1.27083 | 0.1103543 | 11.52 | 0.000 |
| Openness | 0.1871182 | 0.0183837 | 10.18 | 0.000 |
| Left wing | -0.0068602 | 0.0052039 | -1.32 | 0.187 |
| Elderly | -0.0840839 | 0.1968152 | -0.43 | 0.669 |
| Net immigration | | | | |
| Unemployment | -24.97994 | 17.20353 | -1.45 | 0.146 |
| Government expenditure | 70.38791 | 19.08547 | 3.69 | 0.000 |
| Openness | -8.027514 | 3.788022 | -2.12 | 0.034 |
| Left wing dummy | 2.537201 | 1.735224 | 1.46 | 0.144 |
| Elderly | -104.8747 | 33.51133 | -3.13 | 0.002 |
| Wald: 3,499 | | | | |
| <i>N</i> = 364 | | | | |

Note. The model is corrected for serial correlation (GLS).

Most results are in line with earlier research. A larger public sector is linked to higher taxes, and higher unemployment results in higher taxes. Note that we cannot find any indication that a left wing majority in parliament indicates higher taxes, other than through the size of the public sector. Somewhat surprising, and not in line with theory, is the result that the more open and trade oriented a country is, the higher the labor tax.

Table 3

Tax on Capital

| | Coefficient | Std. Err. | <i>z</i> | <i>P</i> > <i>z</i> |
|------------------------|-------------|-----------|----------|---------------------|
| Net immigration | -6.286775 | 7.836511 | -0.80 | 0.422 |
| Unemployment | -0.6631513 | 0.1376972 | -4.82 | 0.000 |
| Government expenditure | 0.7575957 | 0.220137 | 3.44 | 0.001 |
| Openness | 0.0149114 | 0.0366722 | 0.41 | 0.684 |
| Left wing | -0.0097454 | 0.0103809 | -0.94 | 0.348 |
| Elderly | 3.505063 | 0.3926111 | 8.93 | 0.000 |
| Net immigration | | | | |
| Unemployment | -57.50057 | 34.31795 | -1.68 | 0.094 |
| Government expenditure | 28.05472 | 38.07209 | 0.74 | 0.461 |
| Openness | 9.277527 | 7.556424 | 1.23 | 0.220 |
| Left wing dummy | -2.447164 | 3.46146 | -0.71 | 0.480 |
| Elderly | -7.504435 | 66.84909 | -0.11 | 0.911 |
| Wald: 1,986 | | | | |
| <i>N</i> = 364 | | | | |

Note. The model is corrected for serial correlation (GLS).

Looking at the impact of migration, we find several noteworthy results. The general result is that net immigration to the country leads to higher tax rates. In addition to this, the combination of a large public sector and large net immigration causes further increases in the tax rate. However, a high degree of openness, and/or a

large share of elderly in the recipient country's population, tends to offset these effects, and the combination of these two factors and net immigration leads to lower tax rates. Unemployment and net immigration have no joint effect on tax rates, once the initial effects are accounted for.

Turning to taxation of capital, many results are similar to those for taxes on labor. In Table 3, we can see that most coefficients have the same sign as for the labor tax, but that many of them are not statistically significant, hardly any of the interaction terms matter, however, and neither does net immigration by itself. Economic openness has no significant impact on the country's capital tax rate, either directly or through interaction with net immigration. As with the labor tax, the political composition in the country's parliament has no impact other than through the size of the public sector, which does have an impact, neither of these variables appears to have additional effects through immigration. It is noteworthy that the effect of unemployment is the opposite compared to that for the labor tax, and the higher the unemployment in the previous period, the lower the tax rate on capital. Interaction with unemployment appears to be the one case where net immigration may have an impact on capital taxes, as the combination of these two variables is linked to lower capital tax rates. A large share of elderly leads to higher capital taxes, but immigration has no impact on this effect.

Concluding Remarks

This paper represents a first attempt to examine whether immigration has affected tax rates in European countries. The results suggest that migration has indeed mattered, at least for taxation of labor. The concerns that immigration could become a burden on the public purse appear to have had some support in reality. Immigration has been linked to higher taxes on labor, especially in countries with large public sectors, although it does not seem to have mattered much for the capital tax rate.

However, the effect of immigration on labor taxes has been less pronounced in countries with a large share of elderly. One interpretation could be that such countries have had greater need of additional labor, and that new immigrants have therefore had an easier time entering the labor market. Our results also suggest that a high degree of openness in the economy reduces the effect of immigrants on the tax rate. It is not obvious why this should be the case, but in a country where many employers trade with other countries, it may become easier for immigrants to find work.

Our relatively simple model has probably not captured all the channels through which migration has affected recipient countries, but our results certainly indicate that the issue is complex, and it is difficult to state clearly whether the impact has been negative or positive overall. The main impact appears to have been to increase taxes, but as we have seen there have also been counteracting mechanisms. Exploring the precise channels through which these mechanisms have acted remains an important task for future research.

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Technology vs. Trade Policies in South Korea

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We performed empirical analyses to see which factor had contributed more to economic growth among trade and R&D investment growth in South Korea. Firstly, we estimated gravity model using the data of trade volume, GDP and geographic distances, for answering what determined the trade volume of South Korea with trade partner, Japan and the US. Gravity model used in trade theory was fitted well to data. When controlled by geographic distances between countries, GDP of Korea and R&D gap were significant statistically. Variance decomposition results show that in four variable VAR systems, the explanatory power of trade is larger than that of R&D investments. This implies that S&T policy in Korea had weaker effect on growth than trade policy. Random coefficient model shows that trade affected GDP (growth) positively mainly in the 1980s and R&D contributed mainly in the 1990s.

Keywords: R&D investment, growth, technology policies, R&D subsidies, trade policy

Introduction

There are controversies about whether high growth rate of South Korea was due to R&D effort or trade liberalization (export-oriented development strategies) (Krugman & Obsfeld, 2006) and South Korea adopted export-oriented not import substituting strategy for development.

The former exploits economies scale for raising the growth of selected industries. The latter refers to relatively balanced growth strategy which protects domestic producers through tariff or subsidies. This development strategy is based on the infant industry argument, which is used now for microfoundation of strategic trade policy argument. In general, industrial policy implementation is based on unbalanced growth theory, infant industry protection.

Simultaneously, it also adopted technology-promoting policy as a means for development.

Figure 1 shows the share of trade in developing countries. Table 1 shows trading volume of South Korea and whole volume of developing countries. The dependency on external economies for Korea is relatively moderate (the lowest among four dragons). But, all economists agree Korea's growth benefited from outward growth strategy. Notwithstanding, other factors also affected growth like high saving rates, and human investment (Krugman, 1994). Now, it is important to check whether trade permitted or caused high rate of growth of South Korea (Krugman et al., 2008; Grossman & Helpman, 1991).

We can ask the following questions: Did export-oriented development strategy and trade liberalization contribute significantly to the high rate of growth in South Korea? Or, is the growth mainly attributed to R&D efforts and catch-up strategy?

We also examine whether outward growth strategy caused to high growth, or is merely correlated with

growth by investigating data for trade volume and R&D data (see Figures 2-4). We use simple econometric model for answering these interesting questions.

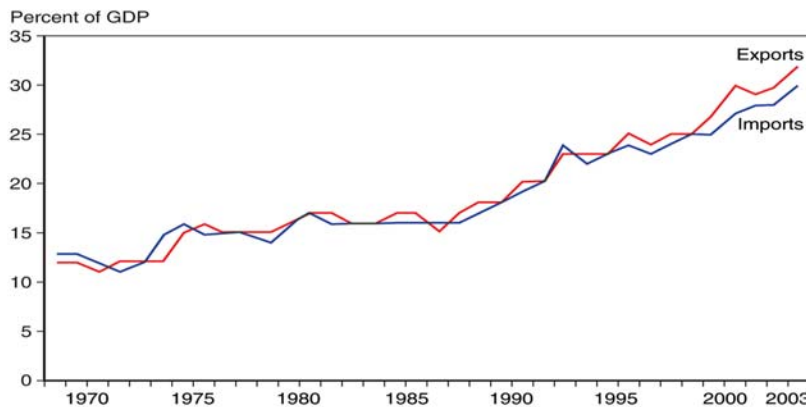


Figure 1. The growth of developing-country trade. Liberalization and developing-country trade: Trade liberalization after 1985 led to a surge in both imports and exports as a percentage of GDP. Source: World Bank.

Table 1

Share of Trade Volume as Percentage of GDP (Krugman & Obsfeld, 2006)

| Country | 1960-1969 | 1970-1979 | 1980-1989 | 1990-1999 | 2000-2004 |
|-----------------|-----------|-----------|-----------|-----------|-----------|
| Singapore (%) | 280.5 | 297.5 | 257.3 | 335.4 | 386.8 |
| Hong Kong (%) | 165.3 | 168.9 | 208.5 | 266.7 | 313.4 |
| Malaysia (%) | 78.6 | 87 | 112 | 177.5 | 215 |
| Thailand (%) | 33.2 | 40.5 | 54.5 | 87 | 125.6 |
| Philippines (%) | 31.8 | 45.8 | 52.4 | 81.2 | 102.6 |
| Korea (%) | 26 | 55.5 | 68.2 | 60.9 | 75.9 |
| Indonesia (%) | 23.3 | 41.6 | 47.1 | 57.7 | 67.7 |
| China (%) | 7.6 | 9 | 21.3 | 36.4 | 47.2 |
| India (%) | 9.2 | 10.2 | 13.3 | 21.2 | 28.7 |
| Japan (%) | 19.4 | 22.8 | 23.6 | 18.2 | 21.6 |
| Average (%) | 67.5 | 77.9 | 95.8 | 114.2 | 138.5 |

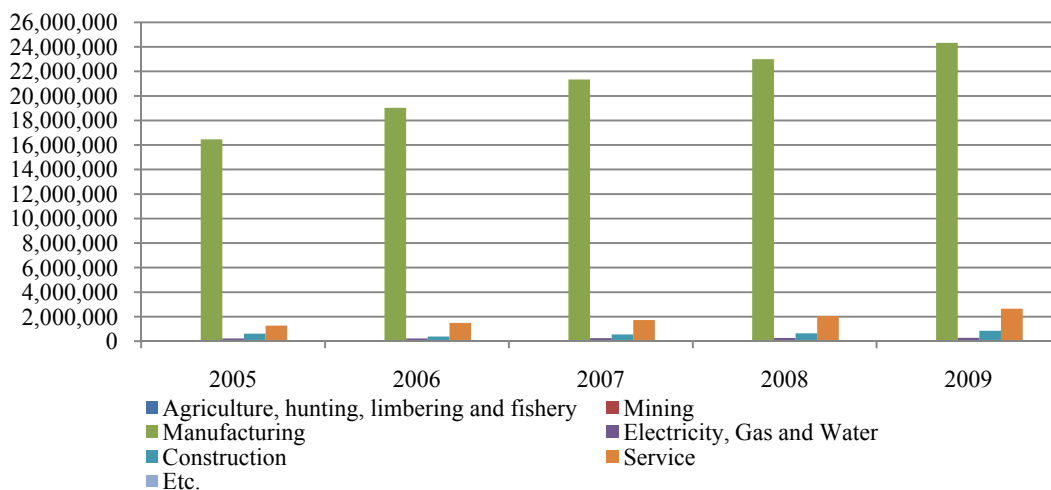


Figure 2. Volume of total (upper graph) and government (lower graph) R&D investments in South Korea (100 Mil. Won, NTIS).

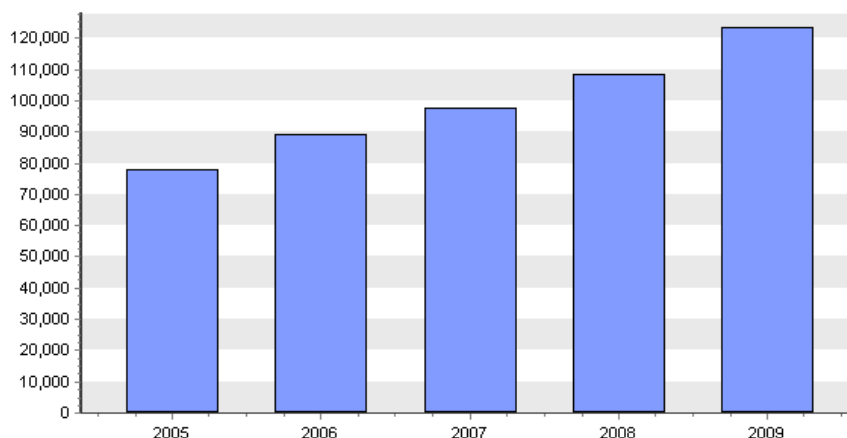


Figure 3. Trend of volume of government R&D investments (100 Mil. Won, NTIS).

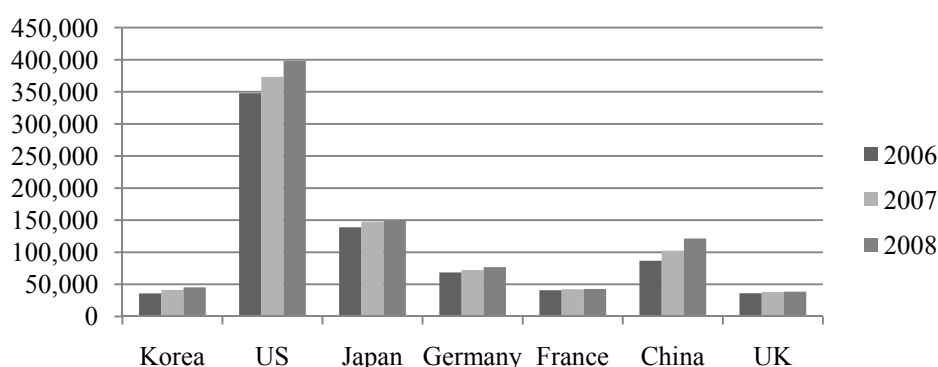


Figure 4. Amount of R&S expenditures (Korea-the US-Japan-Germany-France-China-the UK).

We use three approaches for testing these hypotheses:

First, we use the gravity model that explains the volume of trade as a function of GDP and distance between two countries incorporating productivity (R&D) into GDP terms. From this, we check that trade and R&D is correlated highly.

Second, we adopt the causality and variance decomposition approach in reduced VAR model to disentangle the effects of trade and R&D on growth.

Third, we use state-space model to see and compare the changes of coefficients (trade and R&D) that explain the growth rate.

In R&D policy viewpoint, Korea focused on catch-up strategy and increased government (and, private) research expenditures, in addition to perform government innovation itself. R&D intensity as of 2009 is among top-5 from whole countries. In addition, government used diverse policies such as accelerated depreciation, tariff exemption, tax credit, government procurement policy, tech. information disclosure, promotion of cooperative R&D, and HRST policy, etc. (Kim, 2005).

According to endogenous growth theory, these efforts increases balanced growth path of growth rates (Romer, 1990). As expected, this contributed to the increase of growth rate of per capita income of South Korea. Empirical analysis is performed for this in section 3 and section 4.

In trade policy viewpoint, Korea supported trade liberalization focusing on export-orientation policy (see

Table 2). Latin American countries mainly adopted import-substitution policy, but in the mid-1980s, they changed their policy toward trade liberalization. Korea used industrial policy, and this produced high performance in increasing of export volume. Meanwhile, government can use strategic trade policy. In the spirit of protectionism, government can actively intervene with trade market for creating comparative advantage for domestic industry. This argument is based on economies to scale and hedge amount of investment for appropriating it. The effect of this policy on growth need to be discussed in future research.

Figure 5 for average rate of protection shows indirectly that East Asian economies adopted export-oriented trade policy (compared to that of the US, see Figure 6). We can have question that the effects of this strategy for growth dominated those of technology policies. In this study, we need to distinguish the area between R&D and education or physical investment promotion policy. The reason is that the mechanism through which they affect growth is somewhat different between STI policies.

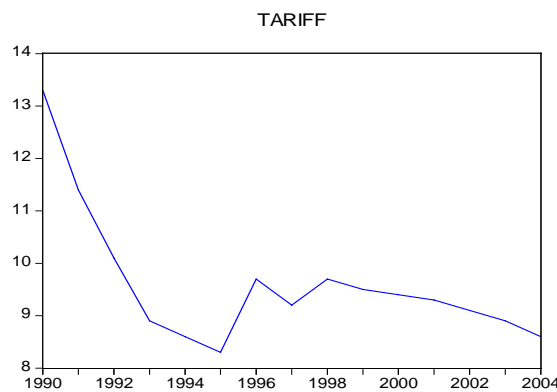


Figure 5. TARIFF: Rate of average import tariff of Korea (%), UNCTAD) Source: Krugman and Obsfeld, 2006.

Table 2

Average Rates of Protection

| Column attribution | Average tariff rate |
|----------------------------------|---------------------|
| High performance Asian economies | 24 |
| Other Asia | 42 |
| South America | 46 |
| Sun-Saharan Africa | 34 |

Note. Source: World Bank. (1993). The East Asian miracle: Economic growth and public policy. Oxford: Oxford University Press, 300.

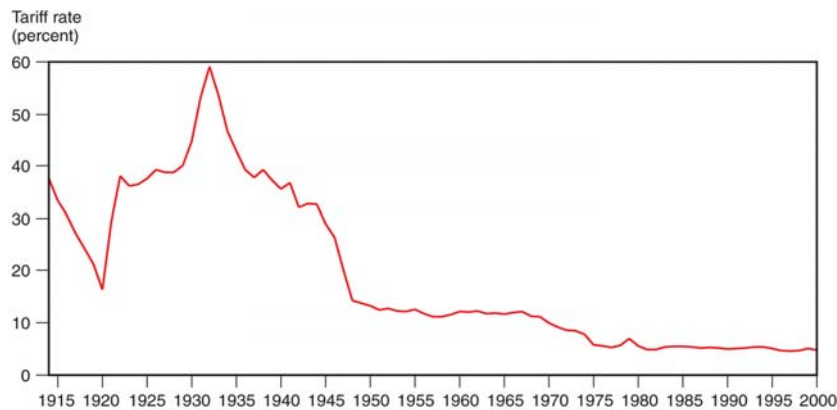


Figure 6. The US traffic rate. Source: Krugman and Obsfeld (2006).

Basic Theoretical Model

Issue

Our basic model asserts that first-best policy (R&D) and second policy have the same effects on growth. We want to check the validity of these arguments.

Small Open Economy: Trade and Welfare

In general, the equilibrium may deviate from socially optimal allocation, in economies with endogenous innovation. First, a static distortion would arise when the price is not set at the marginal cost by market power. Second, dynamic distortions result from the failure to take into account spillover contributions. This model is needed for discussing the effects of trade and technology policy on welfare.

Grossman and Helpman (1991) consider with an economy that trades two consumer goods. We derive the long-run allocation of resources and examine the welfare properties. This model is also helpful for comparing trade and technology policies on growth in the open economy.

We study a small open country that trades two final goods at (exogenously) given world prices.¹ We assume that each sector uses only one primary input. Local producers manufacture these goods using primary and intermediate inputs. The sector that produces good Y employs human capital in amount H_Y and the sector that produces good Z employs unskilled labor in amount L_Z . The productivity gains come from endogenous innovation in the sector that produces (non-tradable) intermediate inputs D .

Compared with ours, Aghion and Howitt (1998) find level effects of opening the autarky economy. They assume the trade of intermediate goods of which the ranges are different. But, in our model of GH (1991), the product of research is not traded. Only focusing the tradable final goods, we can discuss the growth effects of tariff or R&D subsidy.

Each final good is produced according to a Cobb-Douglas technology with CRS (constant returns to scale).

$$Y = A_Y D^\beta H^{1-\beta} \quad (1)$$

$$Z = A_Z D^\beta L^{1-\beta} \quad (2)$$

where β is the income share of capital (intermediate goods).

In equation (1) and equation (2), D represents an index of the intermediate inputs used in sector i , $i = Y, Z$. Intermediate goods are non-traded goods: $D = \int x^\alpha dx$ (Either production function, 1982).

In this way, Grossman and Helpman (1991) analyzed the steady-state equilibrium in small open economy. We omit the introduction in detail for this model in this section.

They assume that human capital is used as input for R&D. In the production of Y , human capital is used, while unskilled labor in Z .

Firms may enter freely into R&D. They can choose to take research or to save their money in the bank. An entrepreneur who devotes n units of knowledge capital to R&D for a unit time interval acquires the ability to produce a , as new products. The effort creates value for the entrepreneur of $v = w_H (a/n)$, since each blueprint has a market value of v ($w_H =$ reward to human capital)² which denotes the productivity of research.

We can identify some reasons why the allocation may deviate from the social optimum with endogenous R&D. In addition, the R&D input n and trade volume of Y and Z are closely related. We examine this relation in

¹ We adopt the usual interpretation of a small economy as being one that does not affect the larger economic environment, and accept the world commodity price as given.

² This free-entry condition may mean that the cost of entry is equal to the value of a firm in the non-tradables sector.

empirical analysis.

In general, attainment of the first-best allocation requires two policy instruments. One is for correcting the static distortion from monopoly pricing for invention and the other offsetting the net effect of the dynamic one (like spillovers). We examine the second-best policy problem that arises when the government has a limited set of policy instruments at its disposal. We investigate whether R&D policies may be used alone to improve welfare and whether trade policies can play such a second-best role³. In general, second-best policy is explained by the number of efficiency conditions. If one of k conditions is violated, it seems to satisfy $(k-1)$ conditions. But, Lipsey and Lancaster (1956) say that this is not the case. It implies that piecemeal approach may not be good instrument leading unexpected outcome.

As mentioned, there are positive externalities (spillovers) in knowledge production. Technological spillovers from industries that are innovative cause the problem of (domestic) market failures. Some economists who argue market failure in favor of protection against free trade put importance on the theory of the second best.

For example, if R&D input is underinvested due to spillovers, a policy of subsidizing private R&D may be good policy, which is useless in an economy with no market failure. Some economists say that domestic imperfections of an economy need interfering in its external functioning. So, this suggests that trade policy like import tariffs may provide a partial solution. But, in Grossman and Helpman (1991), they show that this second-best trade policy can reduce total welfare in some conditions. We investigate to compare the growth effects of these two first-best and second-best policies⁴.

The government requires two policy instruments in order to achieve the first-best allocation in a decentralized economy. An appropriate subsidy to final good producers could be used to eliminate the static distortion from monopoly pricing. This first subsidy compensates the part of the cost of components (the use of intermediate goods) of final goods. It relaxes the resource constraints between (productivity-adjusted) gross output and the rate of innovation.

Growth Effects

In addition, a second policy directed at R&D can be used in combination with the input subsidy to ensure an efficient rate of innovation. It attains best allocation outcome along (new) resource constraint curve.

These two policies compose of the first-best policy package.

Some difficult problems arise as to whether the same results for R&D policy apply when the first-best subsidy is unavailable, due to being unable to implement the first subsidy on the use of intermediate inputs.

We consider the implications of a policy whereby the government only bears a fraction ϕ of the cost of R&D. But, it uses market mechanism for the determination of input prices instead of input subsidy. The solution gives the second-best rate of innovation:

$$\gamma'' = (h/a) - (\rho/\beta\mu)$$

Notice that:

$$\gamma'' = \gamma'$$

that is, the first and second-best rates of innovation coincide. This makes the second-best optimal policy the same

³ A first-best solution is essentially what would be chosen by a planner with complete command over resources. A second-best outcome arises whenever constraints are placed on what the planner can do. Such constraints could be an inability to remove market power, or to dispose all policy instruments.

⁴ We can derive the following equation for the optimal rate of innovation: $\gamma' = (h/a) - (\rho/\beta\mu)$ where h measures the market value of the resource endowment in units of human capital. ρ : subjective discount rate, β : intermediate input share μ : $(1-\alpha)/\alpha$.

as the first-best R&D policy⁵.

In later section, we test this proposition by empirical methods.

Due to the fact that competition maximizes welfare, some economists argue that we should eliminate tariff as a distortion. We consider the implication of trade policy. We introduce T , $i = Y, Z$ to represent (1+ the rate of trade protection) provided to sector i , where protection is an import tariff. This change in relative prices causes the change in production and the price facing consumers.

Trade balance now implies that aggregate spending is equal to the value of output at domestic prices plus government transfers⁶.

Welfare Effects

Through some calculations, we can obtain an equation that shows the total effect of trade policy on welfare.

$$(1-\beta) \rho dU = \{(1-d) \beta \theta(LX) - [\beta \mu (\gamma + \rho) [d\beta \theta(LX) + (1-\beta) \theta(Z)]/\rho\} (T(Y)^* - T(Z)^*) \quad (3)$$

Letting a "star" over a variable denote a proportional rate of change.

In the above equation, θ_{Lx} denotes the value share of factor L in the cost of producing intermediate inputs and θ_Z is the share of sector Z in the value of final output. Later in section 2, we calibrate this welfare function equation using real Korean parameter data.

A trade policy ($T_Z^* > 0$) that promotes growth can reduce its aggregate welfare, and one ($T_Y^* > 0$) that retards growth can raise its welfare.⁷ The ambiguity is consistent with the theory of the second best. This means R&D policies may be used alone to improve welfare by correcting the static distortion and the effect of the dynamic one. But, trade policies may not play such a second-best role.⁸

We want to check the validity of this theory through simple calibration.

Empirical Analysis

Calibration: Welfare Effect

For a small open economy model, we choose the parameter values to match the same set of steady state values on the Korean economy. Hence, overall, we have parameters to calibrate: ($\beta, \rho, \delta, \theta_{Lx}, \mu, \gamma, \theta_Z$).

We set β to match the capital income share of 0.33 (= 1/3) (Bank of Korea & Jones, 2002). We set the subjective discount rate, ρ , to 0.02, an average real interest rate (Bank of Korea).

$\delta = \alpha$ in the case of horizontally differentiated intermediates, and the elasticity substitution parameter is set to 1.99 (STEPI, 2007). θ_{Lx} means the value share of factor L in the cost of producing intermediate inputs and it is set at 0.67 (= 2/3) (Jones, 2002). In no-arbitrage equation, $\mu = (1-\alpha)/\alpha$, in the model of expanding product variety. γ is the rate of innovation, and is calibrated as 0.16 (Young, 1995). θ_Z denotes the share of Z on the value of final output (= 0.6) (STEPI, 2007).

⁵ Typical example of second-best optimum is in the case of Cournot competition in undifferentiated products. In this case, the assumption of a fixed number of firms in standard Cournot model is replaced by free entry condition. The first-best optimum is to subsidize one firm to require price be set to marginal cost. But, if the government cannot regulate an industry, it may be able to control the number of firms. By this, it can attain second-best optimum (Carlton & Perloff, 2005).

⁶ $E = Q + \sum (T_i - 1) p_i^* M_i$ where p_i^* stands for the international price and M_i the volume of imports of good i and M the volume of imports of good i .

⁷ The rate of innovation is as follows: $d\gamma = \psi(T_Z - T_Y)$.

⁸ We can think of an economy that is poorly endowed with unskilled labor (and relatively unproductive in the R&D). When R&D efficiency is low, R&D is insensitive to factor prices. And when unskilled labor is scarce, there is no scope for one final goods industry to expand. This implies that relatively little human capital will move between the R&D laboratory and the production plants that produce final good Y . In these cases, the net effects of trade policy on growth are reduced.

We need to evaluate the sign of the term in the curly brackets in equation (4) in order to identify the nature of the trade intervention with welfare.

$$(1-\beta) \rho dU = \{(1 - \delta) \beta \theta (LX) - [\beta \mu (\gamma + \rho) [d\beta \theta (LX) + (1 - \beta) \theta (Z)]/\rho\} (T(Y)^* - T(Z)^*) \quad (4)$$

The parameter values are summarized in Table 3, 4, 5. A clear conclusion emerges: If we take the parameter values as a measure of the structure of the Korean economy, then a trade policy that promotes growth ($T_Z^* > 0$) reduces welfare. It means, as a second-best trade policy used when first-best R&D policy is unavailable, policy that promotes labor-intensive industry reduces social welfare.

Table 3

Calibration of Korean Economies: Fundamental Values

| | β | ρ | δ | θ_{Lx} | μ | Γ | θ_Z | { } |
|-----|---------|--------|----------|---------------|---------|----------|------------|-------|
| KOR | 0.33 | 0.02 | 1.99 | 0.67 | -0.4975 | 0.16 | 0.8 | 1.223 |

Table 4

Calibration of Korean Economies ($\theta_Z = 40\%$, $\theta_{Lx} = 67\%$)

| | β | ρ | δ | θ_{Lx} | μ | Γ | θ_Z | { } |
|-----|---------|--------|----------|---------------|---------|----------|------------|-------|
| KOR | 0.33 | 0.02 | 1.99 | 0.67 | -0.4975 | 0.16 | 0.40 | 0.827 |

Table 5

Calibration of Korean Economies ($\theta_Z = 40\%$, $\theta_{Lx} = 50\%$)

| | β | ρ | δ | θ_{Lx} | μ | Γ | θ_Z | { } |
|-----|---------|--------|----------|---------------|--------|----------|------------|-------|
| KOR | 0.33 | 0.02 | 1.99 | 0.50 | -0.497 | 0.160 | 0.40 | 0.718 |

A trade policy that promotes growth ($T_Z^* > 0$) reduces its aggregate welfare, and one that impedes growth ($T_Y^* > 0$) raises its welfare (Grossman & Helpman, 1991). The ambiguity entirely depends on the value of parameters.

We also consider the other cases. We can see that the smaller the value of θ_Z , the smaller the value of the term in the curly brackets { }. It means that structural change of the Korean economy into more human-capital intensive production structure makes second-best trade policy more unattractive.

Trade and Productivity

In trade theory, gravity model is frequently used as a model that explains the volume:

$$K(t) = G[n(t), T(t)]$$

T : accumulated trade volume.

$$[\Sigma(X + IM)]$$

$$K(t) = n \Psi(T/n)$$

$$\Delta n = F[K, L] = (1/a) [n \Psi(T/n) L]$$

We estimated this relation using patents and TFP. It shows significant effect, and we conclude that trade affects productivity of knowledge production.

Our Almon lag estimation shows that the increase in the volume of trade leads to decrease at first, but gradually increases knowledge production.

Finite distributed lags model DL (6):

$$y_t = \beta + \beta(0) x_t + \beta(1) x_{t-1} + \beta(2) x_{t-2} + \beta(3) x_{t-3} + \beta(4) x_{t-4} + \beta(5) x_{t-5} + \beta(6) x_{t-6} + e_t$$

We can estimate delay and interim multipliers from PDL (polynomial distributed lag).

$$\begin{aligned}
 B(i) &= \alpha(0) + \alpha(1)i + \alpha(2)i^2 + \alpha(3)i^3 + \alpha(4)i^4 + \alpha(5)i^5 + \alpha(6)i^6 \\
 y(t) &= \alpha + \alpha(0)z_{t0} + \alpha(1)z_{t1} + \alpha(2)z_{t2} + \alpha(3)z_{t3} + \alpha(4)z_{t4} + \alpha(5)z_{t5} + \alpha(6)z_{t6} + e_t \\
 z_{t0} &= x_t + x_{t-1} + x_{t-2} + x_{t-3} + x_{t-4} + x_{t-5} + x_{t-6} \\
 z_{t1} &= x_{t-1} + 2x_{t-2} + 3x_{t-3} + 4x_{t-4} + 5x_{t-5} + 6x_{t-6} \\
 &\dots
 \end{aligned}$$

We used distributed lag model, but ARDL model (equivalently, infinite distributed lag model) allows more flexible specification, and can capture more accurate multipliers (see Table 6 and Table 7).

Table 6

*Estimation of the Effects of International Trade on Innovation*⁹

| Lag distribution of LOG (trade) | Coefficient | Std. error | t-Statistic |
|---------------------------------|-------------|------------|-------------|
| * . . . | -0.40646 | 0.27326 | -1.48741 |
| . . * . | 0.46110 | 0.27356 | 1.68559 |
| . . . * | 0.70982 | 0.14277 | 4.97181 |
| . . . * | 0.39193 | 0.25093 | 1.56191 |
| * . . . | -0.19183 | 0.25928 | -0.73988 |
| * . . . | -0.49223 | 0.33930 | -1.45073 |
| . . * . | 0.28848 | 0.34596 | 0.83384 |
| Sum of lags | 0.76081 | 0.35429 | 2.14739** |

Notes. ** denotes the significance at the significance level 1%; Dependent variable: LOG (PAT_KOR) in n ; Method: Least Squares; Sample (adjusted): 1983, 2002.

Table 7

Estimation of the Effects of International Trade on Productivity

| Lag distribution of LOG (trade) | i | Coefficient | Std. Error | t-Statistic |
|---------------------------------|-----|-------------|------------|-------------|
| . . . * | 0 | 0.01993 | 0.02727 | 0.73081 |
| . . . * | 1 | 0.02133 | 0.02271 | 0.93888 |
| . . . * | 2 | 0.02272 | 0.01846 | 1.23058 |
| . . . * | 3 | 0.02412 | 0.01479 | 1.63074 |
| . . . * | 4 | 0.02551 | 0.01222 | 2.08774 |
| . . . * | 5 | 0.02690 | 0.01152 | 2.33514 |
| . . . * | 6 | 0.02830 | 0.01300 | 2.17674 |
| Sum of lags | | 0.16881 | 0.10352 | 1.63074 |

Note. Dependent variable: D (LNTEFP) ΔA .

The Gravity Model: Trade Volume

In the above section, we considered the causation from trade to productivity. Now, we see the reverse relation.

In trade theory, gravity model is frequently used as a model that explains the volume of trade between any two countries. Recently, Grosche et al. (2007) applied this model to estimation of airline passenger volume. This gravity model is used in so many widespread fields.

If trade $T(ij)$ is the volume between South Korea whose GDP is $Y(i)$, and the US whose GDP is $Y(j)$, it is determined by the following condition. $D(ij)$ is the distance between two countries.

⁹ The diagram in left side means the magnitude of delay multipliers.

$$T(ij) = A \times Y(i)^a \times Y(j)^b / D(ij)^c \tag{5}$$

where a , b , and c are allowed to differ from 1.

If other than factors like R&D affects the trade volume, previous equation can be modified:

$$T(ij) = A(R\&D) \times Y(i)^a \times Y(j)^b / D(ij)^c \tag{6}$$

We compare the estimates and goodness-of-fit of two equations by using trade data for South Korea (see Tables 8-9). All data were obtained from KOSIS, BOK and OECD.

Table 8

Estimation for Gravity Model (i = the US, Japan): Pooled and Fixed Effects

| Dependent variable: LOG (trade) | | | Dependent variable: LOG (trade) | | | Dependent variable: LOG (trade) | | | Dependent variable: LOG (trade) | | |
|---------------------------------|-------------|-------|---------------------------------|-------------|-------|---------------------------------|-------------|-------|---------------------------------|-------------|-------|
| Variable | Coefficient | Prob. | Variable | Coefficient | Prob. | Variable | Coefficient | Prob. | Variable | Coefficient | Prob. |
| C | 9.26 | 0.03 | C | -6.98 | 0.08 | C | 7.94 | 0 | C | 9.49 | 0 |
| LOG(Y) | -0.100 | 0.60 | LOG(Y) | 0.70 | 0.00 | LOG(Y/DISTANCE) | -0.012 | 0.16 | LOG(Y/DISTANCE) | 0.70 | 0 |
| LOG(DISTANCE) | -0.285 | 0.43 | LOG(DISTANCE) | 1.31 | 0.00 | LOG(Y_KOR) | 0.75 | 0 | LOG(Y_KOR) | 0.47 | 0 |
| LOG(Y_KOR) | 0.322 | 0.0 | LOG(Y_KOR) | 0.47 | 0 | | | | Fixed effects(cross) | | |
| LOG(RD-RD_KOR) | 0.64 | 0 | | | | | | | _JAP | -2.32 | |
| | | | | | | | | | _US | 2.32 | |

Table 9

Estimation for Gravity Model (i = the US, Japan): Fixed Effects

| Dependent variable: LOG (trade) | | | Dependent variable: LOG (trade) | | | Dependent variable: LOG (trade) | | |
|---------------------------------|-------------|--------|---------------------------------|-------------|--------|---------------------------------|-------------|--------|
| Variable | Coefficient | Prob. | Variable | Coefficient | Prob. | Variable | Coefficient | Prob. |
| C | 9.494451 | 0 | C | 9.494451 | 0 | C | 9.494451 | 0 |
| LOG(Y/DISTANCE) | 0.702467 | 0.0005 | LOG(Y/DISTANCE) | 0.702467 | 0.0005 | LOG(Y/DISTANCE) | 0.702467 | 0.0005 |
| LOG(Y_KOR) | 0.476308 | 0 | LOG(Y_KOR) | 0.476308 | 0 | LOG(Y_KOR) | 0.476308 | 0 |
| fixed effects (cross) | | | Fixed effects (cross) | | | Fixed effects (cross) | | |
| _JAP-C | -2.329787 | | _JAP-C | -2.329787 | | _JAP-C | -2.329787 | |
| _US-C | 2.329787 | | _US-C | 2.329787 | | _US-C | 2.329787 | |

Estimation results show that the prediction of gravity model explains the volume of trade well. In special, both GDP of Korea and its counterparts are significant in explaining trading volumes. Fixed effects estimation has high goodness-of-fit as well as pooled estimation. It is worth noting that R&D gap between partner is significant in explaining trade volume, so that Fagerberg (1996) and Hughes (1986)'s tech. gap theories apply well.

Variance Decomposition

We analyze variance decomposition to see the effects of (R&D and) trade volume on the productivity (and growth). For this, we construct reduced VAR (vector autoregressive) model that explores the causal relationship between time-series variables. Pesaran and Shin (2002) presented generalized VD as a mean of identifying structural disturbances from observation.

Lag lengths in a VAR is determined by log-likelihood, likelihood ratio or information criteria. Most criteria show that optimal lag length is three (see Table 10).

An (reduced-form) VAR (3) is expressed as:

$$x_t = \alpha(1) + \beta(1)x_{t-1} + \theta(1)y_{t-1} + \delta(1)z_{t-1} + \beta(2)x_{t-2} + \theta(2)y_{t-2} + \delta(2)z_{t-2} + \beta(3)x_{t-3} + \theta(3)y_{t-3} + \delta(3)z_{t-3} + e_t$$

$$y_t = \alpha(4) + \beta(5)x_{t-1} + \theta(5)y_{t-1} + \delta(5)z_{t-1} + \beta(6)x_{t-2} + \theta(6)y_{t-2} + \delta(6)z_{t-2} + \beta(7)x_{t-3} + \theta(7)y_{t-3} + \delta(7)z_{t-3} + e_t$$

$$z_t = \alpha(8) + \beta(9)x_{t-1} + \theta(9)y_{t-1} + \delta(9)z_{t-1} + \beta(10)x_{t-2} + \theta(10)y_{t-2} + \delta(10)z_{t-2} + \beta(11)x_{t-3} + \theta(11)y_{t-3} + \delta(11)z_{t-3} + e_t$$

where, x : R&D expenditure; y : trade volume; z : TFP.

Table 10

Four Variable VAR Lag Selection

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|-----|----------|-----------|-----------|------------|------------|------------|
| 0 | 77.39733 | NA | 8.81e-08 | -4.893155 | -4.706329 | -4.833388 |
| 1 | 201.2816 | 206.4738 | 6.71e-11 | -12.08544 | -11.15131* | -11.78660 |
| 2 | 217.5803 | 22.81821 | 7.01e-11 | -12.10535 | -10.42392 | -11.56745 |
| 3 | 247.7247 | 34.16367* | 3.23e-11* | -13.04832 | -10.61957 | -12.27134* |
| 4 | 263.8274 | 13.95565 | 4.61e-11 | -13.05516* | -9.879113 | -12.03912 |

Notes. * denotes the significance at the significance level 5%; VAR lag order selection criteria. Endogenous variables: LNRD (R&D) LOG (trade) (TRADE) LNTFP (Productivity) PERGDPDIF (Growth Rate). Sample: 1965, 2009.

Granger causality tests suggest that if lagged value x has explanatory power for y , then there is causality from x to y . Test results shows that there are causality from trade to R&D and from growth to R&D (see Table 11).

Table 11

Pairwise Granger Causality Tests

| Null hypothesis | Obs. | F-Statistic | Prob. |
|--|------|-------------|----------|
| LNRD does not granger cause LOG(TRADE) | 34 | 0.73404 | 0.3982 |
| LOG(TRADE) does not granger Cause LNRD | | 9.87962 | 0.0037** |
| GROWTH does not granger cause LOG(TRADE) | 34 | 0.11490 | 0.7369 |
| LOG(TRADE) does not granger cause GROWTH | | 2.23061 | 0.1454 |
| GROWTH does not granger cause LNRD | 34 | 4.48679 | 0.0423** |
| LNRD does not granger cause GROWTH | | 1.66146 | 0.2069 |

Notes. ** denotes the significance at the significance level 1% respectively, hereafter. Sample: 1965, 2009; Lags: 1.

Variance decomposition analysis is used to decompose the share of specific effect of variance when decomposing the forecast error variance of a specific variable. It is based on the estimates of VAR coefficients.

Variance decomposition shows that the explanatory power of the variance in R&D for the variance of forecast error is about 30% (see Table 12). But, the explanation for productivity of trade is merely below 5%.

We can find that the share of explanation of R&D on TFP is relatively large. So, we can say that as far as R&D effort aims at improving productivity, its goal seems to have succeeded. Next, we investigate whether these R&D efforts succeeded in attaining high growth rate. For this, we compare relative share of variance of R&D and trade jointly.

We expand reduced VAR (vector autoregressive) model into 4 variables model by adding the variable of growth rate in income per capita.

The explanatory power of the variance in R&D for the variance of forecast error of growth is about 20 (see Figure 5). But, the explanation for growth of trade is larger than that of R&D (near 40%) (see Table 13 and Table 14).

These results imply that the contribution of trade is larger than research effort. Implicitly, we can infer that trade liberalization and export-oriented development strategy have led to more contribution to growth than R&D policy.

Table 12

Cointegration Tests

| Hypothesized | | Trace | 0.05 | |
|--|------------------------|-----------|----------------|---------|
| No. of CE(s) | Eigenvalue | Statistic | Critical value | Prob.** |
| None * | 0.816319 | 33.90432 | 15.49471 | 0.0000 |
| At most 1 | 0.000660 | 0.013202 | 3.841466 | 0.9083 |
| Trace test indicates 1 cointegrating eqn(s) at the 0.05 level | | | | |
| Unrestricted cointegration rank test (maximum eigenvalue) | | | | |
| Hypothesized | | Max-eigen | 0.05 | |
| No. of CE(s) | Eigenvalue | Statistic | Critical value | Prob.** |
| None * | 0.816319 | 33.89112 | 14.26460 | 0.0000 |
| At most 1 | 0.000660 | 0.013202 | 3.841466 | 0.9083 |
| Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level | | | | |
| (normalized by $b^* S11^* b = I$): | | | | |
| Normalized cointegrating coefficients (standard error in parentheses) | | | | |
| PAT_KOR | TRADE | | | |
| 1.000000 | -0.000413 (3.5E-05) | | | |

Notes. *, ** Denote the significance at the significance level 5%, 1% respectively, hereafter. Sample (adjusted): 1983, 2002; Series: PAT_KOR TRADE A; Unrestricted cointegration rank test (trace).

Table 13

Variance Decomposition for TFP

| Variance decomposition of LNRD | | | | |
|---------------------------------------|------|--------|-------------|-------|
| Period | S.E. | LNRD | LOG (TRADE) | LNTFP |
| 1.00 | 0.15 | 100.00 | 0.00 | 0.00 |
| 2.00 | 0.23 | 97.66 | 1.00 | 1.33 |
| 3.00 | 0.30 | 97.18 | 1.95 | 0.87 |
| 4.00 | 0.35 | 96.65 | 2.73 | 0.62 |
| 5.00 | 0.42 | 96.66 | 2.73 | 0.61 |
| 6.00 | 0.48 | 96.06 | 3.06 | 0.87 |
| 7.00 | 0.55 | 94.91 | 3.90 | 1.19 |
| 8.00 | 0.61 | 93.92 | 4.44 | 1.64 |
| 9.00 | 0.68 | 93.10 | 4.77 | 2.13 |
| 10.00 | 0.74 | 92.28 | 5.14 | 2.58 |
| Variance decomposition of LOG (trade) | | | | |
| Period | S.E. | LNRD | LOG (TRADE) | LNTFP |
| 1.00 | 0.10 | 0.51 | 99.49 | 0.00 |
| 2.00 | 0.12 | 0.67 | 99.30 | 0.03 |
| 3.00 | 0.12 | 6.30 | 93.66 | 0.04 |
| 4.00 | 0.14 | 26.63 | 68.35 | 5.01 |
| 5.00 | 0.18 | 43.63 | 44.33 | 12.04 |
| 6.00 | 0.21 | 52.75 | 31.13 | 16.12 |

(to be continued)

| 7.00 | 0.25 | 57.93 | 23.36 | 18.71 |
|---------------------------------|------|-------|-------------|-------|
| 8.00 | 0.29 | 61.19 | 17.74 | 21.08 |
| 9.00 | 0.33 | 63.10 | 14.05 | 22.85 |
| 10.00 | 0.37 | 64.15 | 11.84 | 24.01 |
| Variance decomposition of LNTFP | | | | |
| Period | S.E. | LNRD | LOG (TRADE) | LNTFP |
| 1.00 | 0.03 | 15.86 | 22.68 | 61.45 |
| 2.00 | 0.04 | 26.92 | 9.05 | 64.04 |
| 3.00 | 0.05 | 28.85 | 5.93 | 65.22 |
| 4.00 | 0.07 | 30.27 | 3.93 | 65.80 |
| 5.00 | 0.08 | 30.42 | 2.87 | 66.70 |
| 6.00 | 0.09 | 30.36 | 2.37 | 67.27 |
| 7.00 | 0.10 | 30.25 | 2.06 | 67.69 |
| 8.00 | 0.11 | 30.20 | 1.77 | 68.03 |
| 9.00 | 0.11 | 30.12 | 1.56 | 68.33 |
| 10.00 | 0.12 | 30.02 | 1.41 | 68.57 |

Table 14

Variance Decomposition for Growth Rate (of GDP per Capita)

| Variance decomposition of LNRD | | | | | |
|---------------------------------------|------|--------|-------------|-------|-----------|
| Period | S.E. | LNRD | LOG (TRADE) | LNTFP | PERGDPDIF |
| 1.00 | 0.09 | 100.00 | 0.00 | 0.00 | 0.00 |
| 2.00 | 0.12 | 98.10 | 0.64 | 1.14 | 0.12 |
| 3.00 | 0.15 | 74.59 | 8.85 | 1.15 | 15.41 |
| 4.00 | 0.17 | 56.17 | 20.28 | 6.45 | 17.10 |
| 5.00 | 0.19 | 51.83 | 18.74 | 12.51 | 16.92 |
| 6.00 | 0.20 | 48.27 | 17.61 | 17.60 | 16.53 |
| 7.00 | 0.22 | 43.01 | 18.53 | 22.33 | 16.14 |
| 8.00 | 0.23 | 41.36 | 18.34 | 23.98 | 16.31 |
| 9.00 | 0.24 | 41.13 | 17.29 | 23.96 | 17.62 |
| 10.00 | 0.25 | 40.47 | 17.23 | 23.84 | 18.45 |
| Variance decomposition of LOG (TRADE) | | | | | |
| Period | S.E. | LNRD | LOG (TRADE) | LNTFP | PERGDPDIF |
| 1.00 | 0.10 | 21.23 | 78.77 | 0.00 | 0.00 |
| 2.00 | 0.13 | 24.48 | 72.42 | 0.16 | 2.94 |
| 3.00 | 0.14 | 27.47 | 67.36 | 0.25 | 4.92 |
| 4.00 | 0.15 | 30.96 | 59.65 | 4.96 | 4.43 |
| 5.00 | 0.16 | 33.56 | 49.19 | 9.12 | 8.14 |
| 6.00 | 0.17 | 34.66 | 46.62 | 8.71 | 10.01 |
| 7.00 | 0.18 | 33.86 | 47.32 | 8.41 | 10.41 |
| 8.00 | 0.18 | 32.18 | 48.38 | 8.99 | 10.45 |
| 9.00 | 0.19 | 30.35 | 48.42 | 10.75 | 10.48 |
| 10.00 | 0.19 | 29.10 | 47.18 | 13.24 | 10.49 |
| Variance decomposition of LNTFP | | | | | |
| Period | S.E. | LNRD | LOG(TRADE) | LNTFP | PERGDPDIF |
| 1.00 | 0.02 | 39.99 | 22.10 | 37.91 | 0.00 |

(to be continued)

| | | | | | |
|-------------------------------------|------|-------|-------------|-------|-----------|
| 2.00 | 0.03 | 40.66 | 16.52 | 41.53 | 1.29 |
| 3.00 | 0.03 | 31.98 | 26.85 | 38.15 | 3.02 |
| 4.00 | 0.04 | 27.57 | 32.25 | 34.38 | 5.80 |
| 5.00 | 0.04 | 25.75 | 35.36 | 32.41 | 6.48 |
| 6.00 | 0.04 | 24.31 | 35.08 | 34.68 | 5.93 |
| 7.00 | 0.04 | 23.30 | 32.56 | 38.65 | 5.49 |
| 8.00 | 0.04 | 22.19 | 30.52 | 42.13 | 5.17 |
| 9.00 | 0.04 | 21.25 | 29.95 | 43.84 | 4.95 |
| 10.00 | 0.04 | 21.11 | 30.39 | 43.70 | 4.80 |
| Variance decomposition of PERGDPDIF | | | | | |
| Period | S.E. | LNRD | LOG (TRADE) | LNTFP | PERGDPDIF |
| 1.00 | 0.04 | 33.83 | 23.69 | 3.84 | 38.65 |
| 2.00 | 0.04 | 29.51 | 33.10 | 3.85 | 33.53 |
| 3.00 | 0.04 | 27.64 | 35.16 | 3.61 | 33.58 |
| 4.00 | 0.04 | 25.78 | 35.50 | 7.21 | 31.50 |
| 5.00 | 0.05 | 23.83 | 37.62 | 6.84 | 31.71 |
| 6.00 | 0.05 | 23.37 | 39.37 | 6.61 | 30.64 |
| 7.00 | 0.05 | 23.83 | 38.98 | 7.19 | 30.00 |
| 8.00 | 0.05 | 24.70 | 37.88 | 8.72 | 28.70 |
| 9.00 | 0.05 | 24.72 | 36.76 | 10.59 | 27.93 |
| 10.00 | 0.05 | 24.47 | 36.74 | 11.17 | 27.62 |

State-Space Model

We set up time-varying parameter (state-space) model using Kalman filter.

We use two random coefficient (sv1, sv2) models to compare time-varying parameters of log values of trade and R&D investments on log value of GDP.

State space model uses measurement and transition equations for estimating time-varying parameters. It uses prediction-updating algorithm for parameter estimate (henceforth, dependent variable), which consists famous Kalman filter (EViews 6: statistics package).

$$\begin{aligned}
 lngdp &= c(1) + sv1 * log(trade) + sv2 * lnrd + [ename = e1, var = exp(c(2))] \\
 @state \ sv1 &= sv1(-1) + [ename = e2, var = exp(c(3))] \\
 @state \ sv2 &= sv2(-1) + [ename = e3, var = exp(c(3))] \\
 @evar \ cov(e1,e2) &= c(4)
 \end{aligned}$$

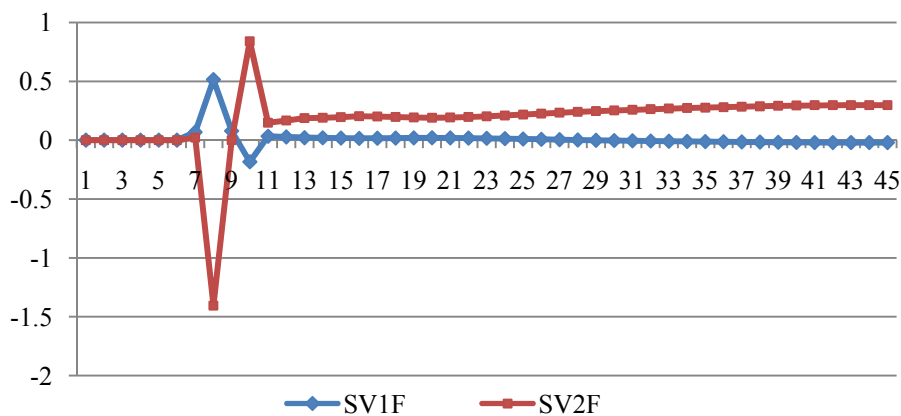


Figure 7. Time-varying parameter model.

Estimates of coefficients show that each contribution to GDP (growth) differs in their time-periods. We can just compare the shapes, but cannot the magnitude exactly.

Conclusion

We find the following facts:

(1) Gravity model explains the trade volume well in Korea. In addition, it is also explained by the R&D gap between trade partners. This implies that there is correlation between trade and R&D. But, to see the causality from R&D (gap) to trade volume, we need more developed statistical tools. This may come only from the fact that trade is allowed by research. We can see whether there is causality from R&D to trade.

(2) The fluctuations of growth rate are explained better by trading volume than that of R&D activity. Causality test shows that R&D is not exogenous variable. This implies that trade caused growth incorporating the spillover or transfer from developed countries' commodities. We can say that at least in Korea, trade was more important to growth than knowledge production. This is derived from empirical evidence, not from analytical model.

(3) The effect of trade and R&D on GDP (growth) can be separated by the time-periods. In the 1980s the former had greater effect, but in the 1990s the latter had greater effect.

Finally, this study suggests that we should not overstate the role of Science and Tech (S&T) policy in South Korea explaining the growth rate, since it may be merely endogenous variable in development process. Rather, we focus on the effects of trade on R&D or the growth on R&D.

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Impact of the Global Financial Crisis on the EU and Euro Area vs. the USA

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This paper will recap the events leading to the global financial crisis, and explore the issues—vulnerability of the banking system, State's independence in regulating its own financial and banking sectors, and the effect of the State's economic fundamentals in order to rise above the crisis—and the effect of this crisis on the EU and in particular the Euro area. Additionally, the impact of this financial crisis in comparison with the USA and China (where data is available) will be discussed.

Keywords: EU/EMU financial crisis, global financial crisis, USA financial crisis

Background

Since the inception of the European Union (EU) in 1957 and the European Monetary Union (EMU) in 1999, to date, 27 countries have joined the EU and 16 countries have joined the EMU. However, at the time of the crisis, only 15 countries had joined the EMU. See Table 1 for a listing of countries and year of membership into EMU and EU.

So, how have these countries or groups of countries fared the global financial crisis? A comparison of the EU-EMU data to that of the United States and China will be provided where available.

The global financial crisis came to a head in early September 2008 following the inevitable sub-prime mortgage crisis in the USA of the prior year. The U.S. sub-prime mortgage crisis erupting in August 2007 spread throughout Europe almost immediately causing write-downs and credit losses of major European banks. According to Stratfor.com, the Europe-wide cost of the subprime crisis up to the time of the global financial crisis resulted in \$323.3 billion in asset write-downs (Schechter, 2009).

Thus, in September 2008, faced with the nationalization, merging, and failure of a number of American financial companies, coupled with tight and illiquid credit markets, fallen consumer spending, and lack of consumer confidence, major instability on the global stock markets with major decreases in market value occurred between September 15-17, 2008.

Many plans to mitigate this crisis were put forward and within a few weeks, U.S. President George W. Bush announced a \$700 billion financial aid package. But the USA was not alone in the reparation plans. On September 28, 2008, Fortis, a large banking and finance firm announced it would be semi-nationalized with Luxembourg, Belgium and the Netherlands investing over 14 billion and 17 billion Euros, respectively, into the company. Soon after, Iceland nationalized the Icelandic lender Glitnir, and nine billion Euros were made available to the bank Dexia by France, Belgium and Luxembourg (Schechter, 2009). On September 29, the United Kingdom, took

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control of mortgage lender Bradford and Bingley and announced it would spend 50 billion pounds on rescuing (and thus partially nationalizing) Abbey, Barclays, HBOS, HSBC, Lloyds TSB, Nationwide Building Society, Royal Bank of Scotland and Standard Chartered (The Financial Crisis in Europe, 2008).

Table 1

European Union/European Monetary Union Countries

| Country | EU year | EMU year | ERM-II year |
|----------------------|---------|---------------------------------------|-------------|
| Belgium | 1957 | 1999 | |
| France | 1957 | 1999 | |
| Germany | 1957 | 1999 | |
| Italy | 1957 | 1999 | |
| Netherlands | 1957 | 1999 | |
| Ireland | 1973 | 1999 | |
| Luxembourg | 1973 | 1999 | |
| Portugal | 1986 | 1999 | |
| Spain | 1986 | 1999 | |
| Austria | 1995 | 1999 | |
| Finland | 1995 | 1999 | |
| Greece | 1981 | 2001 | |
| Slovenia | 2004 | 2007 | |
| Cyprus | 2004 | 2008 | |
| Malta | 2004 | 2008 | |
| Slovak republic | 2004 | 2009-Not in emu when crisis occurred. | |
| Denmark ^o | 1973 | | 1999 |
| U. K. ^o | 1973 | | * |
| Sweden [^] | 1995 | | * |
| Czech rep | 2004 | | * |
| Poland | 2004 | | * |
| Hungary | 2004 | | * |
| Lithuania | 2004 | | 2004 |
| Estonia | 2004 | | 2004 |
| Latvia | 2004 | | 2005 |
| Bulgaria | 2007 | | * |
| Romania | 2007 | | * |

Notes. * Does not participate in ERM II established on January 1, 1999, as a successor to ERM, convergence criterion requires participation in ERM II; ^o opt-out clause for EMU; [^] failed central bank independence rule-requires constitutional amendment.

On October 5, the German government announced a (second) bailout proposal of 50 billion Euros to Hypo, one of the largest real estate companies. Then, unlike the British and German bank-specific bailouts, Spain introduced a 30 billion euro-aid package to buy goods assets from banks. However, in a country where 70% of all bank savings portfolios were in real estate, this type of bail-out package suggested that the entire Spanish system, not just a select number of companies, may in fact have been in need of a bail-out (The Financial Crisis in Europe, 2008).

Later on that month, on October 12, leaders from the 15 Eurozone countries along with British Prime Minister Gordon Brown met to try to solve the worldwide liquidity crisis. They agreed on measures such as guaranteeing interbank loans for up to five years and buying ownership stakes in banks. Specifically, this would be accomplished either by injecting capital straight into the banks (as it was the case with the United Kingdom) or

by setting up interbank loan guarantees. As an example of these agreed-upon measures, together, Germany, France and the United Kingdom announced more than 163 billion Euros of new bank liquidity and 700 billion Euros in interbank loan guarantees (Schechter, 2009).

Reasons for the European Financial Crisis

Three main reasons are posited for the European financial crisis: vulnerability of the banking system, State's independence in regulating the financial/banking sector, and the State's economic fundamentals. So, while most analysts would agree that the underlying reason for Europe's vulnerability in the global financial crisis was not necessarily rooted in the U.S. sub-prime mortgage crisis, this may have served as a trigger; and the underlying real culprit in Europe may be the inter-relationship between the banking system and businesses.

Unlike the United States where the crisis might be contained within the financial and housing sectors, in Europe, close ties exist between banks, industry and at times the government. In fact, a close connection amongst banks and businesses since the 19th century was encouraged by the government. Bank executives often sat on the boards of major industries, and industrial executives sat on the boards of major banks, with the most common example of Siemens AG and Deutsche Bank. This inter-connectivity shields the economy from minor shocks, but with major shocks to the system, especially in times of a global shortage of capital, the economy is left worse off and in this case, the European companies are left with few financing alternatives.

Vulnerability of the Banking System

Thus, irrespective of the U.S.'s sub-prime mortgage crisis, Europe's banking vulnerabilities can be further broken down into three categories: the broad credit crunch, European sub-prime rate, and the Balkan/Baltic overexposure (The Financial Crisis in Europe, 2008).

The global restriction in credit exposes an economy's inefficiencies and underlying economic deficiencies in which many argue were first caused by the post-9/11 global credit expansion in combination with the adoption of the Euro. After the U.S. attacks on September 11, 2001, all monetary authorities—the European Central Bank (ECB) included—flooded money into the system. The U.S. Federal Reserve System dropped interest rates to 1%, and the ECB dropped interest rates to 2% (The Financial Crisis in Europe, 2008).

Cheap credit led to a consumer spending boom (stronger in the credit-poor or smaller economies) both in the real estate market and the overall economy. With the adoption of the Euro, countries like Portugal, Ireland, Italy, Greece and Spain (PIIGS), enjoyed low interest rates normally reserved for the highly-developed, low-inflation economies like Germany. Thus, this offered consumers cheap credit for the first time! The burst in Europe's real estate boom was evident as Spain built more homes in 2006 than Germany, France and the United Kingdom combined. In addition, banks pushed for more lending by giving out liberal mortgage terms, Ireland adopted a no-down-payment 110% mortgage product, and credit checks in Spain were often waived (The Financial Crisis in Europe, 2008).

As a result of this expansion, growth rates approached an unprecedented 15% in the Baltic countries (i.e., Estonia, Latvia, Lithuania and Finland-prior to World War II) causing double-digit inflation whereby making it more difficult for the Baltic States to take out loans to service their enormous trade imbalances. Figure 1 shows the average consumer prices from 2000 to projected 2014. Since the crisis, the gap between the EU's inflation rate in comparison to the EMU, USA and China has widened. Of note, over the entire period, China has experienced the lowest rate of inflation.

Most economists speculate that the prime reason that growth rates were less pronounced in the Balkans (i.e.,

Albania, Bosnia & Herzegovina, Bulgaria, Croatia, Greece, Macedonia, Montenegro, Romania, Serbia, Slovenia, and Turkey) is because these countries either obtained EU membership at a later time, as with Bulgaria and Romania which joined the EU in 2007, or have not yet joined the EU at all, as with the case of Croatia (which applied in 2003 but has yet to joined the EU) and Serbia (which has not applied for EU membership). As a result, these countries did not experience the full credit-expanding effect of being associated with the European Union (The Financial Crisis in Europe, 2008).

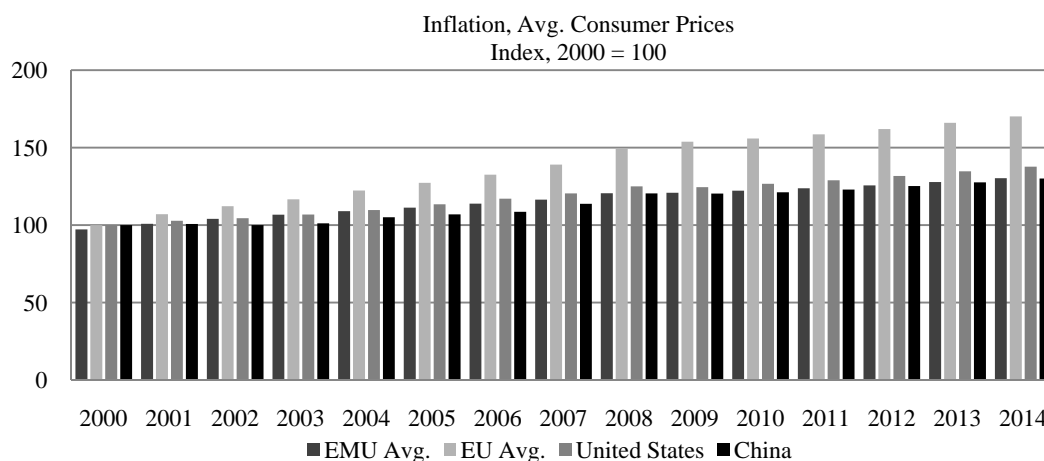


Figure 1. Inflation index. Source: Statistics, 2009.

But, in the Western European banks' quest to expand credit, due to somewhat limited expansion of their local domestic markets, they pushed aggressively into the Central, Eastern, and Southeastern European regions. The Scandinavian banks expanded into the Baltic countries; the Greek and Austrian banks focused on the Balkans; while the Italian and French banks reached out to Russia. The 12 Central, Eastern, and Southeastern European countries in Table 2, show the percentage of foreign ownership of financial institutions from 54% to 97.4%; Macedonia and Slovakia, respectively.

Table 2

Foreign Ownership of Financial Institutions

| Top 12 EU countries | Percent of total banking sector |
|---------------------|---------------------------------|
| Slovakia | 97.4 |
| Czech Republic | 96.2 |
| Croatia | 90.4 |
| Bosnia | 83.3 |
| Bulgaria | 80.0 |
| Poland | 79.6 |
| Montenegro | 78.1 |
| Romania | 70.0 |
| Latvia | 67.5 |
| Serbia | 60.0 |
| Hungary | 58.9 |
| Macedonia | 54.0 |

Note. Source: 2008 Strategic Forecasting Inc. www.stratfor.com.

Unfortunately, with the tightening of credit, while these banks that once led the expansion of credit to other countries were now facing difficulty maintaining credit lines even in their own home markets, these Central/Eastern/Southeastern European, heavily foreign-owned financial institutions were now left “mired in almost Soviet-era credit starvation” (The Financial Crisis in Europe, 2008).

State’s Independence in Regulating the Financial/Banking Sectors

In addition to Europe’s banking vulnerabilities, Europe’s inability to adequately address the challenges facing this financial crisis lies in the fact that each country has the autonomy to deal separately with this situation. Unlike the United States where the President is able to enact a bailout plan for the entire nation, the EU member states are not regulated at the supra-EU level. Each member state regulates its own financial and banking sectors. So, while the Eurozone members agreed to follow general guidelines, the administrative burden of developing, staffing, funding, and managing their bail-out plan lies with each member state and not Brussels or the ECB. While disagreements arose among the fiscally healthy states of Germany and the UK against the heavily budget deficit/national debt states of France and Italy, at the EU level, the only actual proposals to address this crisis have been an increase in the minimum government-guaranteed bank deposit from 20,000 Euros to 50,000 Euros, and a wide reduction in interest rates. But the latter solution also poses issues with respect to the ECB’s guidelines. The Maastricht Treaty dictates that the ceiling on inflation is 2%. With inflation in the Eurozone of 3.6%, a decrease in interest rates would go against the EU by-laws (The Financial Crisis in Europe, 2008)!

State’s Economic Fundamentals

The ability of the individual states to act will be determined by their economic fundamentals. The stronger a state’s economic fundamentals (i.e., trade deficit, budget deficit, national debt, unemployment), the more likely the country will be able to raise money—either by raising taxes or issuing bonds—in order to overcome the crisis. So, which countries are at risk? According to *stratford.com*’s statistics, the countries that are most seriously at threat, due to high budget deficit and government debt are France, Italy, Greece and Hungary with the first three also having active banking ownership in emerging markets in the Balkan States and Central Europe (areas deemed to suffer the most from the credit crisis). Closely following these countries are Romania, Poland, Slovakia, Netherlands, Portugal and Lithuania. Furthermore, dependence on foreign exports and high trade imbalances makes it difficult for a country to purchase European exports on credit. At risk are Germany, the Czech Republic and Sweden as their industrial exports decrease due to a decline in demand and the Central European country will suffer given their high current account deficits expressed as a percent of GDP (The Financial Crisis in Europe, 2008). When graphed over time, Figure 2 shows the current account balances expressed as a percent of GDP from 2000 to a projected 2014. Of note, while the European countries and the U.S. have experienced a deficit over the entire period (except for the average of the EMU countries from 2002-2004), China has reported positive current account balances as a percent of GDP over the entire period peaking at 11% in 2007.

According to Eurostat (Statistics, 2009), the latest data shows that of the 27 members of the European Union, only Denmark, Estonia, Luxembourg, Sweden and Finland had deficits below the pact’s limit of 3% of their cash surplus/deficit as a percent of GDP!

With respect to the 60% guideline for the central government debt as a total percent of GDP, the data shows that the 27 members of the EU have an average debt of 73.6%. Additionally, of the 11 EU countries only Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Romania, Poland, Denmark and Sweden; and from the 16 EMU countries, only Spain, Luxembourg, Finland, Slovenia, Slovakia, and Cyprus had a general government

consolidated gross debt as a percentage of GDP below the pact’s limit of 60% (Statistics, 2009).

Lastly, a graph of the unemployment rate as a percent of the labor force is shown in Figure 3.

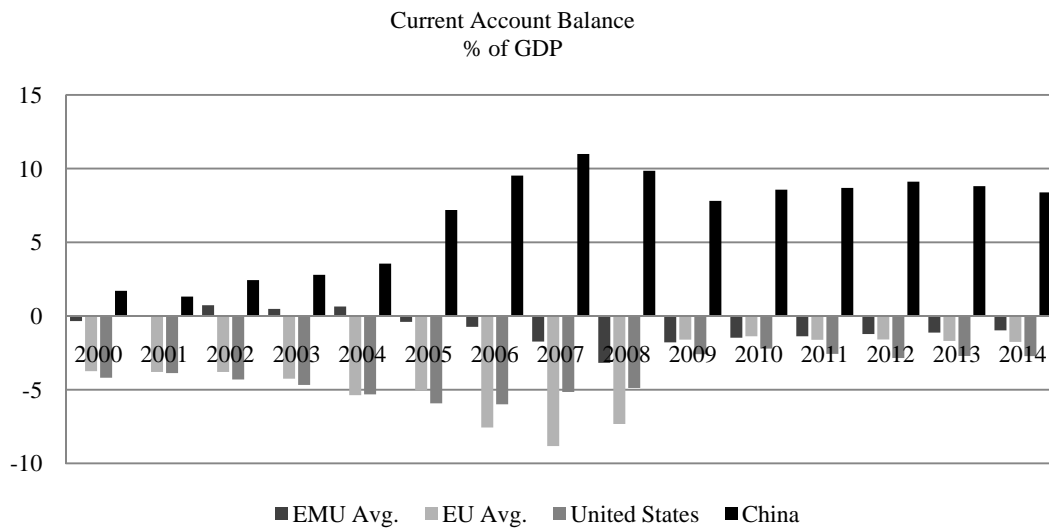


Figure 2. Current account balances. Source: Statistics, 2009.

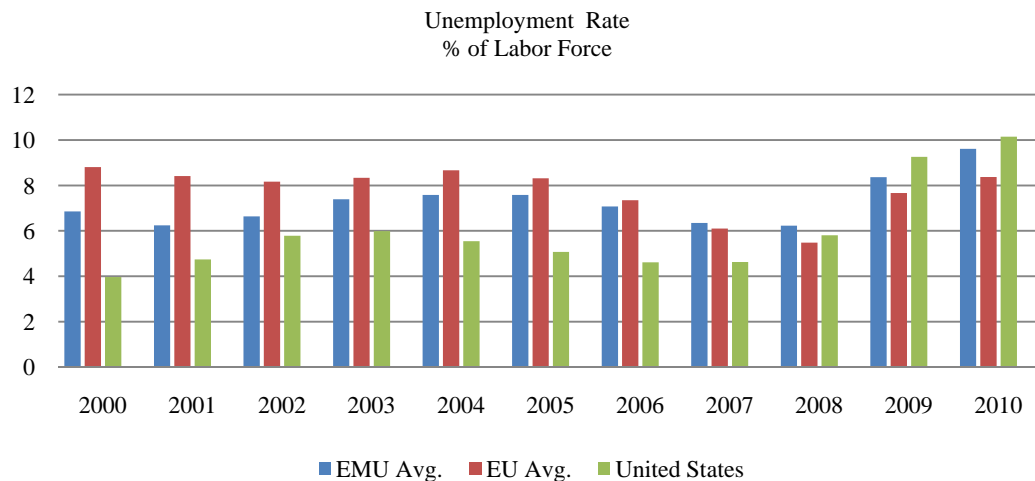


Figure 3. Unemployment rate. Source: Statistics, 2009.

With respect to the unemployment rate of the EMU countries, Netherlands enjoys the lowest average 2000-2010 unemployment rate of 3.74% while Spain suffers from the highest unemployment rate over the same period of 12.18%. Also at risk with rates above the EMU group’s average of 7.27% are Greece, France, Malta, Germany, Finland, Italy and Belgium (in this order). While the average unemployment rate for the EU is 7.79%, at risk is the Slovak Republic with an average unemployment rate of 14.86% over this period. In contrast, the US’s average unemployment rate over this period is 5.96%—spiking from 5.81% in 2008 to 9.3% after the crisis in 2009 (No data was reported for China).

Summary

To date, 27 economies have joined the EU of which 17 (i.e., Belgium, France, Germany, Italy, Netherlands, Ireland, Luxembourg, Portugal, Spain, Austria, Finland, Greece, Slovenia, Cyprus, Malta, Slovak Republic, and Estonia) have entered the monetary “Euro” union. With monetary policies dictated by Brussels, but the execution of agreed-upon policies to be developed, staffed, funded, and executed by each individual nation, the inter-twined managerial and capital connections that exist amongst the banking system and the businesses in which they provide/supply funding, surviving a global financial crisis is not an easy feat! Some believe the European Union and the Eurozone may not survive the financial crisis. In a speech made by the European Commission President Jose Manuel Barroso on March 6, 2009, he stated: “The European Union is facing an unprecedented situation due to the economic crisis and needs to work at different levels to restore credit flows”. He said the bloc’s economy is expected to contract by 2% this year (Schechter, 2009).

The concerns raised with this crisis have initiated a plethora of issues in the economic and political global arena. There is no simple solution to this global financial crisis!

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Changes in Marketing Process Management Employing TMS: Establishment of Toyota Sales Marketing System *

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The purpose of the total marketing system (TMS) is to aid changes in marketing process management by correctly identifying customer demands, conducting proper business and sales activities and implementing customer science to contribute to merchandise development. As an example of application study using science SQC, the author established the Toyota sales marketing system (TSMS), an intelligent customer information network system, to improve the repeat customer ratio for Toyota vehicles. The achievements of the present study are currently being applied at Netz Chiba and other Toyota dealers.

Keywords: science TQM, total marketing system, customer science, science SQC, CAID and cramer's analysis, Toyota sales marketing system, Toyota

Introduction

Having predicted the state of manufacturing in the next generation, the author proposed Science TQM as the principle of scientific quality management to enhance the key axis of total quality management (TQM) activities. To apply the proposed total marketing system (TMS) which is the core principle of Science TQM, to the business and sales activities, the author demonstrates its effectiveness through Toyota's new TQM activities aimed at developing innovate ways to build ties with customers. As an example of application study, Science SQC is used to enable the scientific application of customer information utilization software for Toyota user information, and the intelligent development and application of a customer information network is discussed. Concretely speaking, the study deals with the subject of improving the sales rate for replacement Toyota vehicles, which involves setting up Toyota Netz dealers in a model case.

Categorical automatic interaction detector (CAID) and Cramer's analysis is used to identify characteristics and variations in customer orientation through the analysis of user questionnaire data. Accordingly, specific models are developed for customers of high replacement probability. Next, the knowledge thus obtained is used to generate specific measures for increasing sales through customer retention (CR) based on customer type, enabling the construction of the Toyota sales marketing system (TSMS), an intelligent customer information network system. The achievements of the present study are currently being applied at Netz Chiba and other Toyota dealers.

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Background: Need for a Marketing Strategy Which Considers Market Trends

Today's marketing activities require more than just short-term strategies, such as 4P (product, price, place and promotion) activities by the business and sales divisions. After the collapse of the bubble economy, the competitive environment in the market has drastically changed. Since then, companies that have implemented strategic marketing quickly and aggressively have been the only ones enjoying continued growth (Okada et al., 2001).

After close examination, it was said that strategic marketing activities must be conducted as company-wide, core corporate management activities that involved interactions between divisions inside and outside of the company (Jeffrey & Bernard, 2005). Therefore, a marketing management system needs to be established so that business/sales/service divisions, which are carrying out development and design for appealing products projects, and which are also in the closest position to customers, can organizationally learn customers' tastes and desires by means of the continued application of objective data and scientific methodology (James & Mona, 2004; Shimakawa, Katayama, Oshima, & Amasaka, 2006).

However, at present, the organizational system has not yet been fully established in these divisions. In some cases, even the importance of this system has not been commonly realized (Niiya & Matsuoka, 2001; Gary & Arvind, 2003; Ikeo, 2006).

Changes in Marketing Process Management Employing TMS

Role and Expectations of TMS

To create attractive, customer-oriented products to meet customers' satisfaction, the various divisions of a manufacturer must share a common language, ensuring unity and proper direction. This is necessary for all divisions, including business, sales, service, planning, development, design, production engineering, manufacturing, logistics, administration and management.

Thus, the author (Amasaka, 2004, 2008) proposed Science TQM having five core principles—total marketing system (TMS), total development system (TDS), total production system (TPS), total intelligence management system (TIS) and total job quality management system (TJS)—as a new principle for manufacturers' TQM activities in the next generation as shown in Figure 1.

Figure 2 shows a conceptual diagram that indicates expectations for the new core technology of total marketing system (TMS), which is the core principle of Science TQM facilitating new TQM activities of the business and sales divisions. These activities include: (1) market creation activities through collection and utilization of customer information; (2) strengthening of merchandise power based on the understanding of elements required for products to retain their value; (3) establishment of marketing systems from the viewpoint of building ties with customers; and (4) realization of a customer information network for CS (customer satisfaction), CD (customer delight) and CR (customer retention) elements needed for the corporate attitude (behavioral norms) to enhance customer values.

Need for Customer Science Using Science SQC

The author (Amasaka, 2005) proposed customer science so as to contribute to systematizing the TMS as shown in Figure 3. To plan and provide customers with attractive products is the mission of enterprises and the basis of their existence. It is particularly important to convert customers' opinion (implicit knowledge) to images

(linguistic knowledge) through market creation activities, and to accurately reflect this knowledge in creating products (drawings, etc.) using engineering language (explicit knowledge). This refers to the conceptual diagram that rationally objectifies subjective information (y) and subjective objective information (\hat{y}) through application of correlation technology.

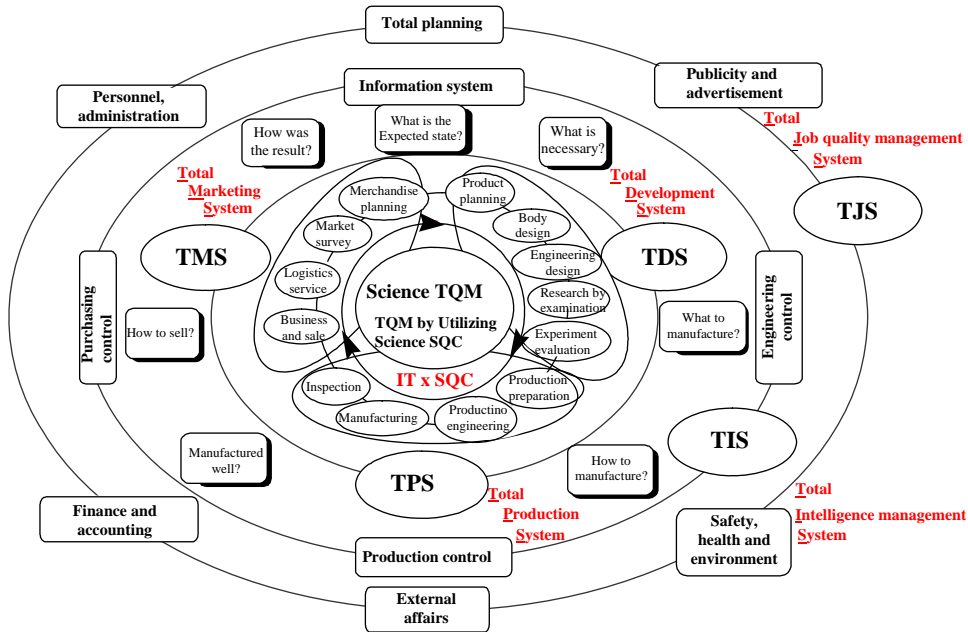


Figure 1. Science TQM, new quality management principle.

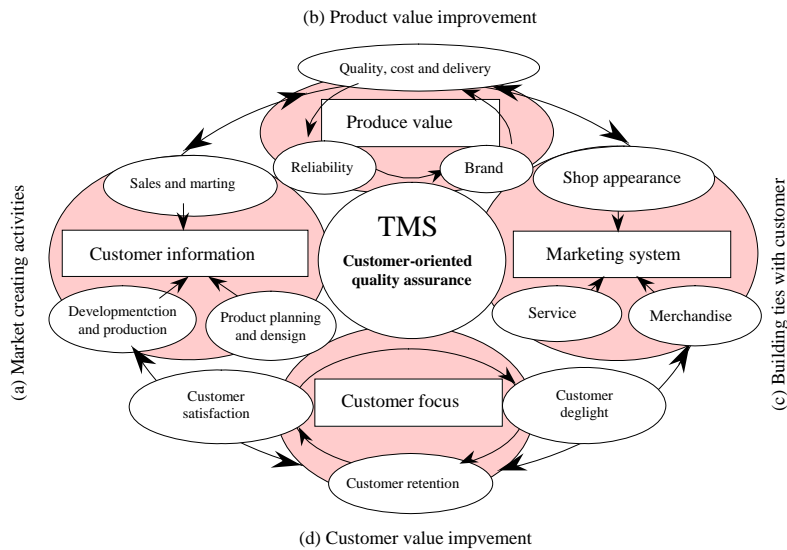


Figure 2. Conceptual diagram of TMS.

Thus, the author (Amasaka, 2003) applies the Science SQC having four core principles—scientific SQC, SQC technical methods, integrated SQC network “TTIS” and management SQC—for strategic development of science TQM, which is designed to develop customer science in the business and sales divisions as a change in marketing process management as shown in Figure 4.

Importance of Innovating Dealers’ Sales Activities

Considering recent changes in the marketing environment, it is now necessary to implement innovation of business and sales activities to accurately grasp the characteristics and changes of customer preferences independently of convention. Contact with customers has never called for more careful attention and practice.

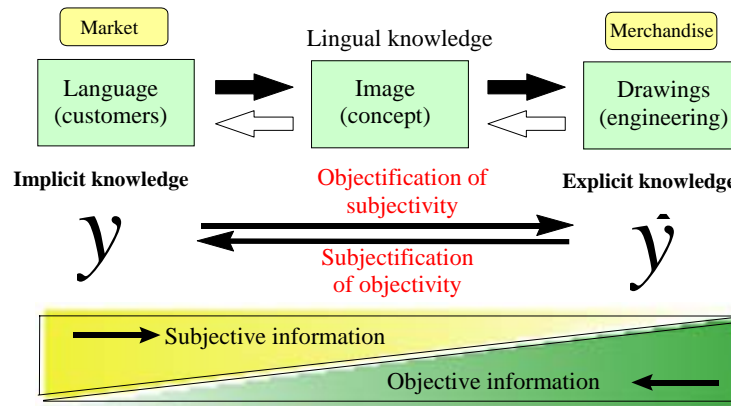


Figure 3. Conceptual diagram of customer science.

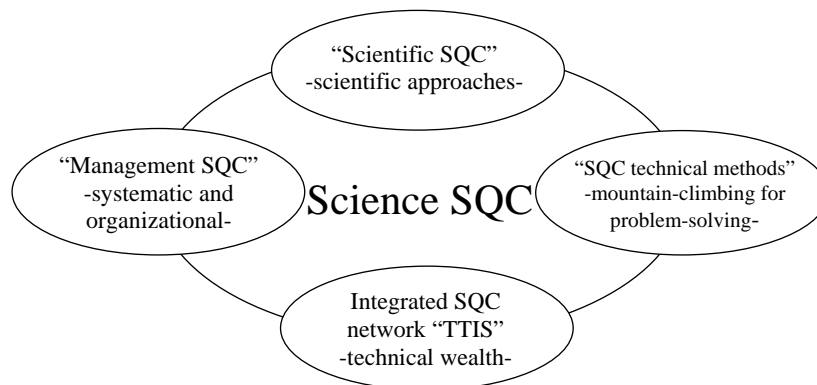


Figure 4. Science SQC, new quality control principle.

For example, it is now more important to construct and develop an intelligent customer information network that systematically improves know-how related to the application of customer information software with respect to users of various vehicle makes. This information network turns customer management and service into a science by utilizing science SQC according to customers’ involvement with their vehicles in daily life. To realize the innovation of business and sales activities as shown in Figure 5, the following three factors are important: merchandise, shop and selling power, and shop appearance and operation. These factors are: (1) innovation for building ties with customers is particularly important in innovating shop appearance and operation. It constitutes the base for the innovation of; (2) business negotiation; (3) employee images; and (4) after-sales service (Amasaka, Kishimoto, Murayama, & Ando, 1998).

Establishment of Toyota Sales Marketing System (TSMS)

As an example of research studies for innovating the mode of business and sales operation, the author established an intelligent customer information network system called the Toyota sales marketing system (TSMS)

to improve the repeat customer ratio for Toyota vehicles. The achievements of the present study are currently being applied at Netz Chiba and other Toyota dealers (Amasaka et al., 1998; Amasaka, 2001a).

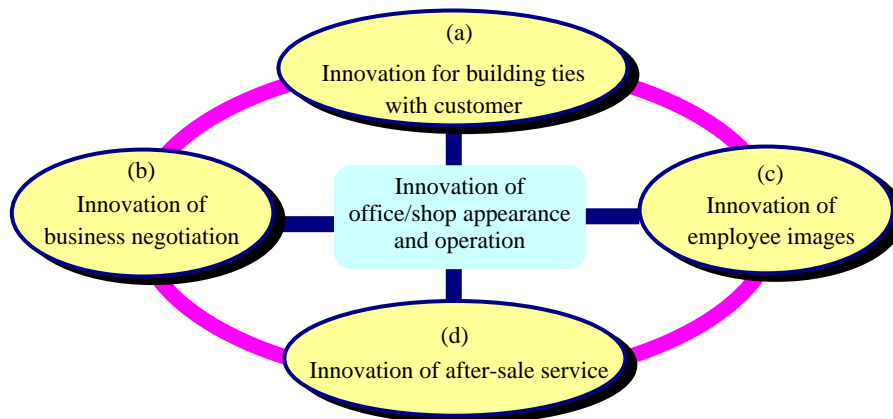


Figure 5. Innovation of the business and sales activities.

Trial for Increasing Sales Through CR Based on Customer Type

The author implemented customer science to enable increased sales through customer retention (CR) based on customer type. For a model case, two Toyota A-dealers (Netz Chiba and one other) were selected and sales activities were enhanced by developing specific models for customers with a high probability of replacing their Toyota vehicle. Concretely speaking, this is a change from the current customer information-based uniform CR method to a CR method based on customer type for stratifying customers by ascertaining their orientation and/or changes from a wider area of selection of the conditions.

Practical Studies on Science SQC

The author solves problems by using scientific approaches such as “mountain climbing for problem-solving” (development of specific models for customers of high replacement probability) following the steps from (i) to (ix) shown in Figure 6. This involves application of SQC technical methods (demonstrative scientific methods using a combination of new seven tools (N7), multivariate analysis (MA), experimental design (DE), etc.), which is one of the core techniques of science SQC (Amasaka, 2003).

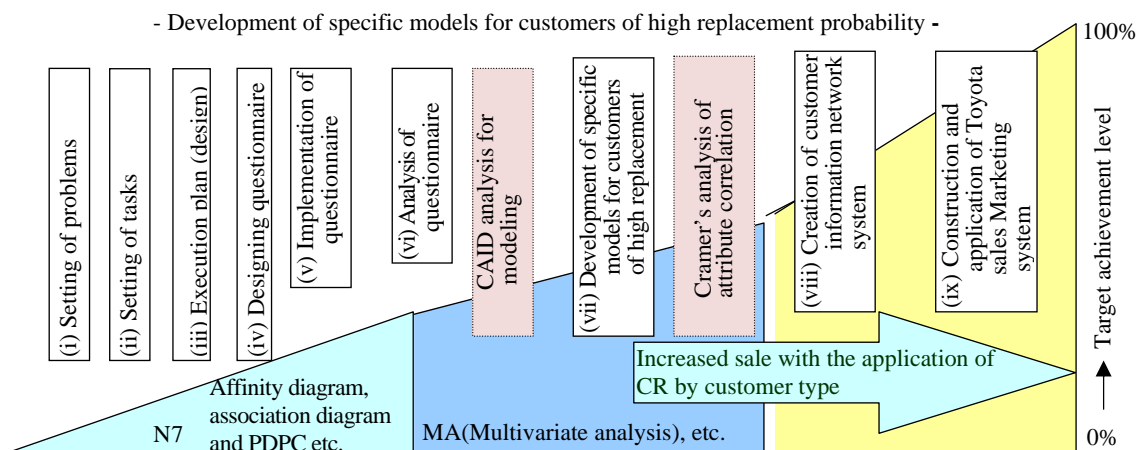


Figure 6. Mountain climbing for problem-solving.

In steps (i) and (ii) shown in Figure 6, consideration was given to the development of specific models for high replacement probability customers as shown in Figure 7, an “application type” association diagram. The aim was to increase sales through CR based on customer type, and the tools used include the N7 (affinity diagram, relation diagram, process decision program chart (PDPC), etc.). Then, in step (iii), a scenario of implementation plans for about a year was established.

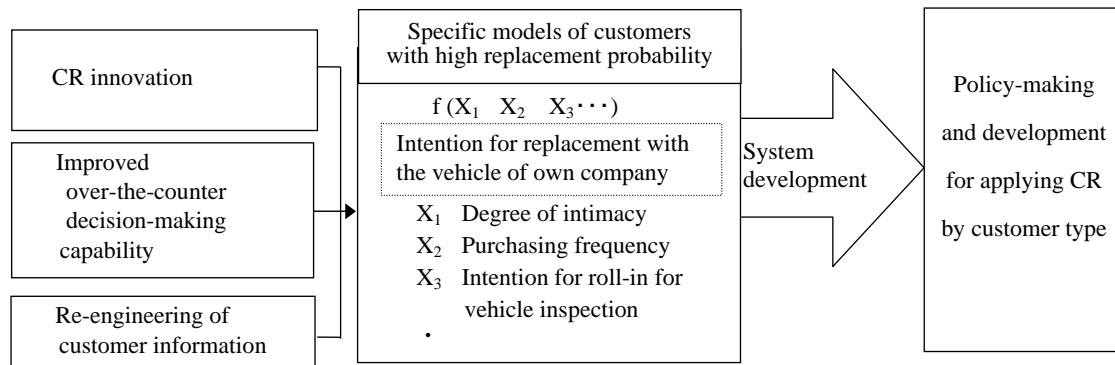


Figure 7. “Application type” association diagram (step (i)-(iii)).

In steps (iv) through (vi), the graphical categorical automatic interaction detector (CAID) analytical method (Amasaka, 2001a) was implemented. This method has been developed as the new multivariate analysis, and was necessary for the qualitative and categorical data analysis required for questionnaire design, implementation and analysis. Based on the information thus obtained, models were established for high replacement probability customers.

In the next step (vii), the sales method capable of deploying CR based on customer type was obtained using the Cramer’s analysis of attribute correlation as the base for developing the customer information network system in step (viii). In the final step (ix), the scenario at Netz Chiba was examined as the basis for deployment to all Toyota dealers for the establishment of TSMS.

Development of Specific Models for High Replacement Probability Customers

Objective and explanatory variable for the planned questionnaire form. (1) Objective variable: Intention to replace with Toyota vehicle: (Yes, No); (2) Explanatory variable: Records of roll-in (oil change, inspection and maintenance, fault repair, accident repair, vehicle inspection), number of new cars purchased, referral for new car purchase, voluntary insurance contract, degree of intimacy, degree of Toyota card usage, sex, age, etc. (categories 3 to 6).

Four measures to achieve design and implementation of effective questionnaire. Prior telephone notification was given to 4,000 customers who bought new Toyota vehicles within the five years on the planned questionnaire. To improve the recovery rate of the questionnaire, a simply-designed questionnaire was adopted with one section of questions laid out on one page as shown in Table 1 (Case-1). The subjects were required to answer methodically within about 15 minutes. Furthermore, introduction of a “questionnaire information box” helped raise the recovery rate to over 40% (normally 20%) and the valid reply ratio to 98% (normally 70%).

Analysis of questionnaire with CAID and Cramer’s analysis of attribute correlation etc.. After analysis of the questionnaire data, the results of analysis of causal relations were indicated graphically to

accurately show the proposed measures and decision-making process that led to increased sales through the application of CR based on customer type. Then, CAID analysis (Murayama et al., 1982; Amasaka, 2001a) and Cramer’s analysis of attribute correlation (Perreault et al., 1980) were applied to enable collation using empirical rules to form analysis I and analysis II as follows.

Table 1

Example of Questionnaire Form (Case-1) Designing and Implementation of Questionnaire.

| | ①Dealer used | ②Reason for using | ③Method of payment | ④Method of roll-in |
|---|---|--|---|--|
| 1. Oil change (please name a principal shop / station you use) | 1. Dealer you purchased a new vehicle from 2. Other dealer 3. Vehicle maintenance service shop 4. Car shop 5. Gas station 6. Other () | 1. Because of acquaintance 2. High level of technique 3. Low price 4. Privilege offered 5. Nearness of location 6. Other () | 1. Cash 2. TOYOTA CARD 3. Other cards 4. Other () | 1. Drive to the shop 2. Have the vehicle picked up 3. Other () |
| 2. Inspection and maintenance service of your vehicle (Please name a principal shop you use) | 1. Dealer you purchased a new vehicle from 2. Other dealer 3. Vehicle maintenance service shop 4. Car shop 5. Gas station 6. Other () | 1. Because of acquaintance 2. High level of technique 3. Low price 4. Because of guidance 5. Nearness of location 6. Other () | 1. Cash 2. TOYOTA CARD 3. Other cards 4. Other () | 1. Drive to the shop 2. Have the vehicle picked up 3. Other () |
| 3. Repair service of fault of your vehicle (please name a principal shop you use) | 1. Dealer you purchased a new vehicle from 2. Other dealer 3. Vehicle maintenance service shop 4. Car shop 5. Gas station 6. Other () | 1. Because of acquaintance 2. High level of technique 3. Low price 4. Good attending attitude 5. Nearness of location 6. Other () | 1. Cash 2. TOYOTA CARD 3. Other cards 4. Guarantee 5. Other () | 1. Drive to the shop 2. Have the vehicle picked up 3. Other () |
| 4. Repair service of your vehicle after an accident (please name a principal shop you use) | 1. Dealer you purchased a new vehicle from 2. Other dealer 3. Vehicle maintenance service shop 4. Car shop 5. Other () | 1. Because of acquaintance 2. High level of technique 3. Low price 4. Good attending attitude 5. Nearness of location 6. Other () | 1. Cash 2. TOYOTA CARD 3. Other cards 4. Guarantee 5. Other () | 1. Drive to the shop 2. Have the vehicle picked up 3. Other () |
| 5. Next vehicle inspection (what type of service shop would you select?) | 1. Dealer you purchased a new vehicle from 2. Other dealer 3. Vehicle maintenance service shop 4. Car shop 5. Other () | 1. Because of acquaintance 2. High level of technique 3. Low price 4. Because of guidance 5. Nearness of location 6. Other () | 1. Cash 2. TOYOTA CARD 3. Other cards 4. Other () | 1. Drive to the shop 2. Have the vehicle picked up 3. Other () |
| 6. Purchase of a new vehicle (what type of shop would you select to purchase from?) | 1. A shop you purchased your present car from 2. A shop other than one you purchased your present car from 3. Other () | 1. Because of acquaintance 2. Sales staff is enthusiastic 3. Good attending attitude 4. Using the shop for the check-up and maintenance service of your vehicle 5. Good purchasing condition 6. Other () | 1. Cash 2. Installment 3. Lease 4. Other () | 1. Drive to the shop 2. Have a sales staff come to see me 3. Other () |

Notes. We like to inquire on the after-sales services of dealer. Q1: please let us know the present state of the maintenance, fault, repair and other your vehicle-related after-sales service (please give us an answer for each item from ① to ④).

(1) Analysis I: Analysis I involves arranging customers having a high-probability of replacement with Toyota vehicles into a model using intelligent CAID analysis. Factors affecting replacement by high-probability customers are rearranged in the same manner as the variable designation method of multi regression analysis. This is conducted repeatedly based on empirical techniques of the staff and managers of business/sales divisions (so as to match their experience). Then, the characteristics and changes in the customers' orientation are ascertained on the basis of actual contact with customers. Customers are stratified into customer types (customers of high, medium and low repeat business probabilities) from the customer CR point of view.

(2) Analysis II: Analysis II involves conducting factorial analysis using "creation of ties with customers" as the key point to map out our business and sales policies (Cramer's analysis of attribute correlation, etc.). In practice, correlation among influential factors is extracted by the intelligent CAID, including the degree of intimacy and roll-in for vehicle inspection and all other question items using the Cramer's analysis of attribute correlation. For example, factors which improve the degree of intimacy with customers are identified from the sales activity and after-service activity viewpoints, aimed at deployment for sales policies.

Analytical result with CAID (Analysis I: From step vi to step vii). Figure 8 shows the legends of the analytical results. Analysis *a* in the figure indicates that 62% of 1,610 users who answered the questionnaire intend to replace their vehicles with a Toyota vehicle, while 38% do not. Next, analysis *b* is the division by the primary influential factor of the "degree of intimacy". The upper setting of having "intimacy" (customers having good acquaintance with sales staff) indicates that 75% intend to buy Toyota for replacement, and the lower setting of having "no intimacy" (customers not having good acquaintance with the sales staff) indicates that 48% intend to buy Toyota. The difference between them is as much as 27%.

Thereafter, *c* indicates the analytical result for users who bought Toyota for the first time and those for two times and over (no significant difference among 2nd to 5th time purchasers). Similarly, analysis *d* stratifies the users by the "intention for roll-in for vehicle inspection service".

From Figure 8, it is known that 90% of customers of level 1 (regular customers) indicated in the top position of *d* intend to buy a Toyota vehicle for replacement. The figure combines customer types of whom 70% intend to buy Toyota (*b*, *c* and *d*) on customer levels 1 through 3 (regular customers), and classifies them as customers of high probability.

Likewise, customer types of whom 50% intend to buy Toyota on the customer levels 4 through 7 (customers) are classified as customers of medium probability. Customers on level 8 are classified as customers of low probability since they fail to hold a majority. The author does not discuss other influential factors (such as *e*: introduction, *f*: sex, and so forth) where difference is noted between two dealers (Netz Chiba and Netz Ehime).

Analytical result with Cramer's analysis of attribute correlation (Analysis II: From step vii to step viii). Practical and detailed analysis is conducted from the sales policy standpoint aimed at increasing the frequency of contact with customers. Here, the correlation between the degree of intimacy extracted in step (vi) and all other questions is explained using a factor and result diagram based on the Cramer's analysis of attribute correlation as shown in Figure 9. Area 1 in the figure contains factors *a* through *i* influential to the degree of intimacy and area 2, factors *j* through *w* affecting the roll-in destination for vehicle inspection. "Index" in the figure represents the customer information numerically.

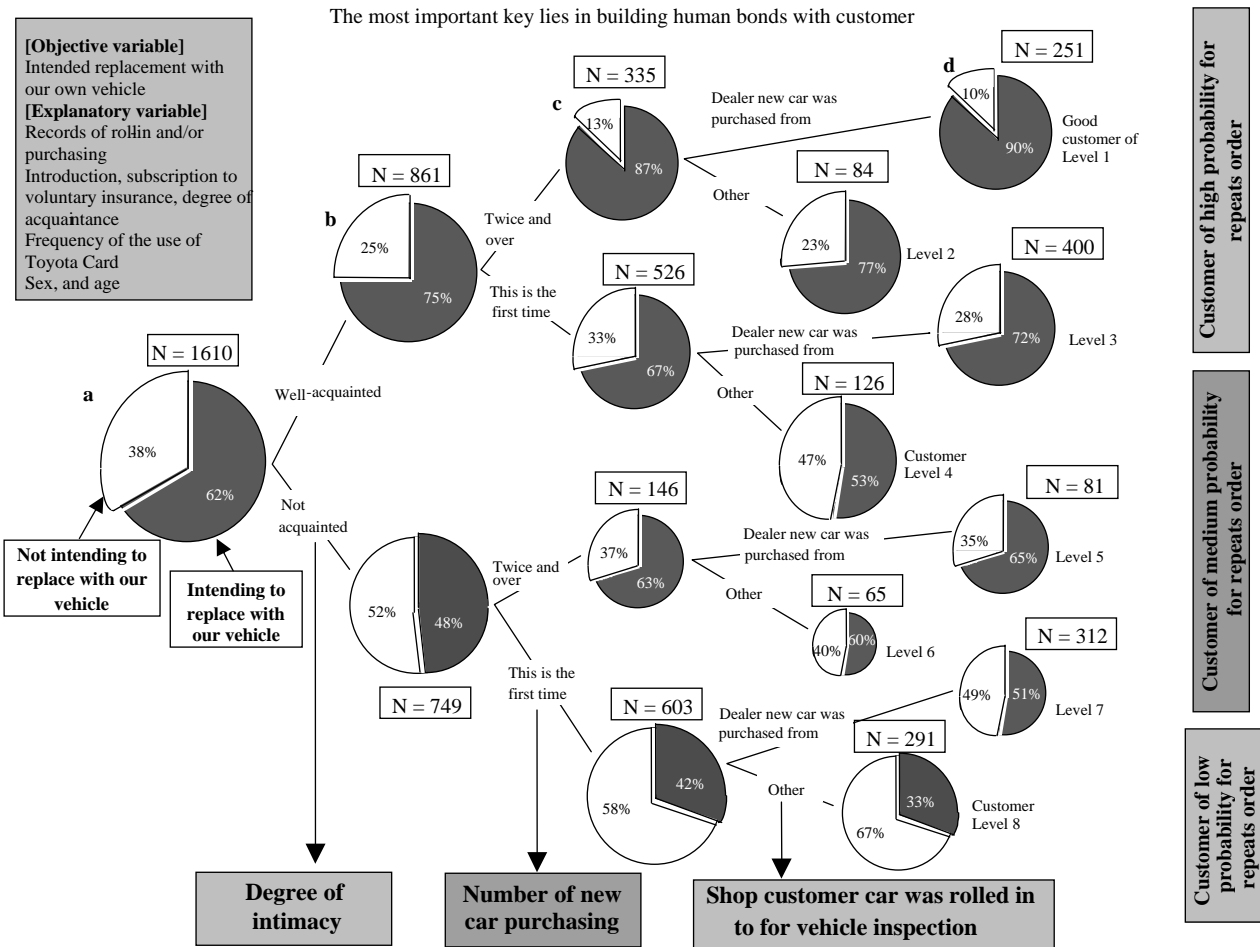


Figure 8. CAID^{*1} analysis (step (vi)), ^{*1} multiple cross-section analysis (categorical automatic interaction detector).

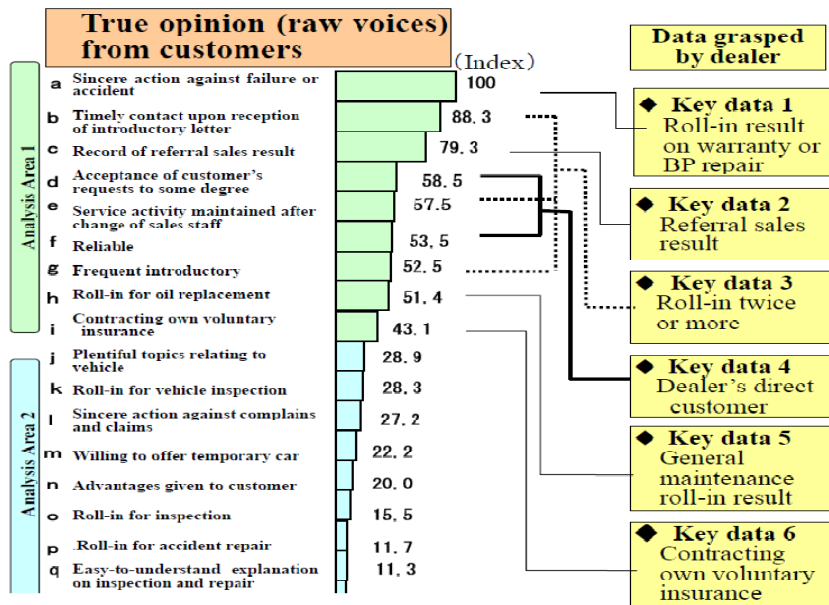


Figure 9. Factor analysis of Cramer's analysis of attribute correlation (example of degree of intimacy).

For example, the 0.14 of “sincere action against failure or accident” is an index when the Cramer’s factor correlation coefficient is assumed to be 100. It is technically possible to correlate all factors in area 1 with the six key data shown in the figure. Based on the information obtained as a result of these analyses, practical policies can be established for promoting sales and after-service activities capable of improving the degree of intimacy with customers who can be handled by a dealer.

The information can also be used for simulation for sales expansion, which is the basis of innovation for creating strong contact between the dealer and its customers.

Construction and application of Toyota sales marketing system (TSMS). Figure 10 illustrates the Toyota sales marketing system reflecting the contact between dealer and customers based on the information obtained above and containing the practical policies for sales and service activities in step (ix) of Figure 6.

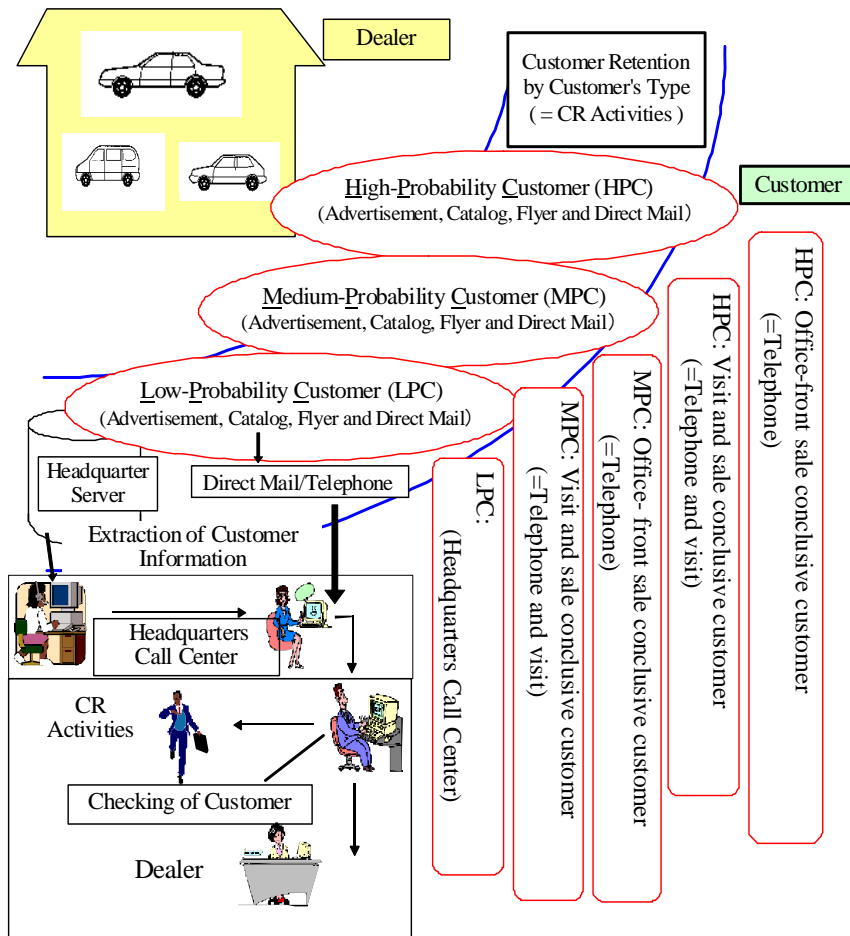


Figure 10. Schematic drawing of “Toyota sales marketing system”.

For practical application, the questionnaire in step (vi) is reanalyzed at trial stages of the system in steps (vii) and (viii) of Figure 6 in order to ensure replacement by Toyota vehicles by adding the following strategies.

(1) The CR activities based on customer type are adopted by classifying high- and middle-probability customers into those who visit the shop and those who must be visited by our staff, taking characteristics at new car purchase into account. A system is established so that the shop manager directly receives

“medium-probability customers (MPC)” upon their visit to the shop without fail in order to promote visits to the shop by “high-probability customers (HPC)”. Thus, the frequency of contact with customers is increased. Further, sales and service activities focus on telephone calls for customers who visit the shop, and telephone calls and home visits for those who require visits by our staff, as shown in Figure 10.

(2) As for “low-probability customers (LPC)” who have less contact with the sales staff, a telephone call center is established within the dealer as shown in the figure to accumulate know-how related to the effective use of customer information software. The two-step approach is adopted as the practical sales policy where telephone calls are used to follow up on the effect of publications, advertisements, catalogs, fliers and direct mail. As expected, excellent results have been reported at Netz Chiba and other Toyota dealers who introduced this system by applying the Toyota sales marketing system constructed as above.

In parallel to this study, the authors (Amasaka, 2001b, 2007; Kojima et al., 2010; Ishiguro et al., 2010) recently studied so called “database marketing” where the effects of publications, advertisements, catalogs, fliers and direct mail are quantitatively analyzed to enable effective support for this system. The application of TSMS has recently contributed to an increase in the sales share of Toyota vehicles in Japan (40% in 1998 to 46% to 2008) (Nikkei Institute, 2009).

Conclusion

In applying the proposed total marketing system (TMS) to aid changes in marketing process management, the author demonstrated its effectiveness through Toyota’s new TQM activities aimed at developing innovative ways to build ties with customers.

As an example application study, Science SQC was used to enable the scientific application of customer information utilization software for Toyota user information. More specifically, the author took up the subject of improving the sales rate for replacement Toyota vehicles. This involved setting up Toyota Netz dealers in a model case.

Employing CAID and Cramer’s analysis, the author used user questionnaire data to identify characteristics and variations in customer orientation. This enabled the development of specific models for customers of high replacement probability.

The knowledge thus obtained was then used to establish specific measures for increasing sales through customer retention (CR) based on customer type and construct the Toyota sales marketing system (TSMS), an intelligent customer information network system. The achievements of the present study are currently being applied at Netz Chiba and other Toyota dealers (Nikkei Business, 1999).

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The Relationship Between Personal Qualities of Entrepreneurs and Their Success in Small Industries: An Empirical Study in Iranian Culture*

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Practitioners constantly report on the significance of the research on entrepreneurship in keeping the performance of small industries. This motivated the present research to explore the relationship between personal qualities, with a moderator role of national culture on the success of entrepreneurs in small industries in Iran. The mail survey yield 240 completed responses, which were included in the final analysis. The objectives of the study were reviewed using appropriate descriptive and inferential statistical procedures. The results of the analysis revealed that entrepreneurs with high personal qualities are more successful than those perceived low level of these qualities. On the other hand, this study found a significant positive linear relationship between personal qualities and entrepreneurs' success in terms of growth (sales, employee, and profit). Besides, the relationship between personal qualities and entrepreneurs' success, was completely found to be moderated by national culture within small industries in Iran. Thus, success of entrepreneurs in small industries needs to be addressed at individual level and the moderating role of national culture remains essential and should not to be disregarded in any future research pertaining to entrepreneurship.

Keywords: entrepreneur, success, national culture, personal quality, small industry

Introduction

The causal relationship between entrepreneurship and economic growth was the subject of debate from a theoretical and practical ground (Benzing, Chu, & Kara, 2009; Poh, Yuen, & Erkko, 2005). This viewpoint is supported by Zacharakis, Bygrave, and Shepherd (2000), based on their observation in 16 developed economies, and that majority of the differences in gross domestic product (GDP) growth between countries were explained by entrepreneurial movement. In addition, Henderson (2002) showed the significant role of entrepreneurs on economic activity and job creation. In another study, Kuratko (2005) clearly emphasizes that since 1980, top 500 large American firms have significantly contributed in the creation of 5 million employments, whereas at the same time, entrepreneurs through venture creation or company development have created more than 34 million

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jobs. This shows the strength of entrepreneurs in inducing employment opportunities while helping in growth the wealth of the nations.

In addition to the importance of entrepreneurship as mentioned above, the past two decades have seen increasingly rapid advances in the growth of manufacturing industries on a small scale (Carree & Thurik, 1998). Besides large companies, small industries also play a vital role in enhancing economic growth and employment. Perhaps it is noticeable that the discussion on small industries is gaining attention in developing countries, particularly in Iran. Facing the fact that about 99.4% of all companies belong to the small industries in Iran (Dehdashti & Naderifar, 2007). Evidently, this great number of small industries in Iran reveals the importance of them to Iranians' economical advances. Despite such a vital role, the failure rate for these companies remains a serious and important issue for planning authorities (Erofeev, 2002).

A report by the small businesses administration (SBA), indicates that a quarter of these businesses went bankrupt in the first two years after their establishment in 1993 with half of them going broke in four years time (SBA, 1993). According to Nucci (1993), in spite of the fact that entrepreneurs in small companies can play a significant role in economic development and job creation, they can play the same role in creating chaos once defeated or go broke. Besides, according to researchers, there is variety of factors that were proven to affect the success of the entrepreneurs. The literature was reviewed to determine the most significant factors found in previous studies. On the other hand, in this study, the researcher tries to report on the early results from a research program which combine the research on success factors to come up with a more comprehensive evaluation of success factors. All these studies endeavored to depict the influential elements of entrepreneurs' success in different types of businesses and industries.

Overview of Entrepreneurship and Small Industries in Iran

While efforts have been made by Iranian academics through projects, literature research and translation to some extent, the fact indicates that developing entrepreneurship requires a more systematic research in a country similar to Iran hoping that founding the Faculty of Entrepreneurship at Tehran University supported by the Ministry of Labor helps to take a significant step forward to reach this objective and take the path with systematization of entrepreneurship issues. With this regard, the membership of this faculty in the global entrepreneurship monitor (GEM) has a significant and recent step taken in 2007 in order to share the successful experience of other states' reports which can be read in the 2008 GEM report (Zali, 2009). Entrepreneurship Development Plan in Universities (KARAD) and establishment of Amirkabir University's entrepreneurship center in 2000 for education, research, awareness programs, and consulting were the initial attempts in realizing the Third Five-Year Development Plan (2000-2005).

A report by Iran Management and Productivity Study Center (IMPSC) (2008) demonstrated that great changes took place in the political and planning systems of industrial development in Iran after the Islamic revolution in 1979. Many industries changed to national industries after the "Protection of Industrial Development" law was ordained and the management of the industrial sectors was passed onto three ministries. In August 2005, the Iran Small Industries and Industrial Parks Organization (ISIPO) came into being. According to the above, it can be said that, the movement towards independence and small industries development flourished rapidly after the revolution.

A number of influential factors including controlling imports, creating industrial areas, rural areas industries, increasing the number of professional and technical centers, expanding technical and engineering service companies, helped the development of small industries. Although some financial aid was allocated to these industries after the revolution (since they had become national industries), it is worth noting that these small industries continued to grow without having necessary support system (IMPSC, 2008).

The Industry and Mines Survey in 2009 (done by Iran's Statistical Center) revealed the existence of around 449,596 industrial sectors in Iran; around 99.8% of which had fewer than 50 employees. Two point fifteen million people were employed in these sectors and the employment rate for the small industries was 63.4%. It is worth mentioning that the overall number of industrial sectors with operation license was 78,928 in 2009, and 92% of which had fewer than 50 workers. Overall, 2.13 million people (43%) were employed in these small industries. Therefore, we can say that the industrial development movement, which helped the development of large industries, in turn also helped the development of small industries. These small industries are responsible for 93% of employees and 43% of employment rate in Iran (Faraji, 2009).

Theory and Hypotheses Development

Reviewing the history and the background of the available research in entrepreneurship studies, Cunningham and Lischeron (1991) have pointed out that there are six schools of thought for defining entrepreneurs: (1) the "great person" school of entrepreneurship; (2) the psychological characteristics school of entrepreneurship; (3) the classical school of entrepreneurship; (4) the management school of entrepreneurship; (5) the leadership school of entrepreneurship; and (6) the intrapreneurship school of entrepreneurship.

The description of entrepreneurs in the first school pictures them as people who must be able to present attitudes that others find interesting. This perception suggests that entrepreneurs are capable with certain traits or qualities that make them sound different from other people. The second school of thought has focused on personal qualities; three personality characteristics have received extensive notice in the research: (1) the personal values such as honesty, duty, responsibility, and ethical behavior; (2) risk taking propensity; and (3) the need for achievement. In the third school point of view, entrepreneurship refers to the process of creating an opportunity, and the management school of thought mentions that as in most fields of organizational study, entrepreneurship is drawn closely related to management theory. As Cunningham and Lischeron (1991) demonstrated the leadership school of entrepreneurship is a non-technical side of the management school. For the final feature, the intrapreneurial school has adopted the perception that entrepreneurs are within organization.

On the other hand, value-belief theory of Hofstede (2001) and Triandis (1995) demonstrated that the values and beliefs held by members of cultures influence the degree to which the behaviors of individuals, groups, and institutions within cultures are enacted, and the degree to which they are viewed as legitimate, acceptable, and effective.

Even so, in this research framework, we have shared with the first and second schools of thought of entrepreneurship originated by Cunningham and Lischeron (1991). Personal qualities come from the first and second schools of thought, and value-belief theory of Hofstede (2001) and Triandis (1995) have been used for role of national culture.

According to Sun (2004), entrepreneurship scholars have developed a variety of theories as they have attempted to understand the factors of success. He points out that, research on entrepreneurship created a measurement called entrepreneurial direction to explain the various combinations of influence that cause an individual to exhibit entrepreneurial characteristics. This theory has categorized various behavior traits of entrepreneurs with different aspects of entrepreneurs, which other researchers have so far focused on them.

It is clear that researchers assume that entrepreneurs have different personality traits compared with other people. Moreover, this concept has received more attention from the academic research community (Owens, 2003). Lee and Tsang (2001) argue that in the field of entrepreneurship, studies of the psychological characteristics of entrepreneurs outnumber most other topics. In the following section, researcher will try to identify some evidences and rationales for relationship between personality traits within researches.

Mischel and Shoda (1998) believed that personality characteristics are useful in explaining the generation of behavior when the situation is considered. This means that the power of personality characteristics to predict a certain behavior depends on the fit between these personality characteristics and the environment in which the behavior is shown. Despite inconsistent findings among some trait studies, substantial evidence has emerged around certain factors. In particular, three traits have been consistently linked with entrepreneurship: need for achievement, risk taking propensity, and locus of control (Duchesneau & Gartner, 1990). Brockhaus (1982) also suggested that need for achievement, locus of control, and risk taking have been widely used in many studies and may have some validity in differentiating among types of entrepreneurs.

McClelland's (1961) theory of the need for achievement and Rotter's (1966) locus of control theory are the most frequently applied theories in research on entrepreneurship for explaining the entrepreneurial qualities and motivation. Besides, much of the entrepreneurship literature includes risk taking as a main entrepreneurial characteristic (Cunningham & Lischeron, 1991).

As mentioned above, there are varieties of personality factors that can influence success. As it was pointed out earlier, many scholars have studied various personality traits, which can affect entrepreneurs' success. After studying previous researches, the present study aims to take into account the most common factors affecting entrepreneurs' success. Although personality traits and their effects on entrepreneurs' success have been studied in many different settings, they have not been applied in Iran, in which the study of entrepreneurship is still a new field. Therefore, a longitudinal study of this nature can be very fruitful.

Researchers and experts in the field of entrepreneurship have numerated the various personality traits, which can affect entrepreneurs' success. These traits can vary from one individual to another. According to the literature review, the three stated traits have been used most often in previous research. To the best of the researchers' knowledge, the present study is a pioneering work in the field of entrepreneurship in Iran. The researchers decided to only consider these three traits in their research. Naturally, the other various traits that have been used less extensively in other studies could not be selected as the best practice in identifying the entrepreneurs' success. The selected three traits, which have been used in various longitudinal studies, were identified as the best practices with a high predictive power for entrepreneurs' success. They closely associated with potential for engaging in entrepreneurship were selected for present study, which can naturally be used in other settings with lower growth rate in entrepreneurship such as Iran.

In this study, three separate traits are used to define the entrepreneurial profile. These were chosen from a number of alternative traits because they capture different facets of the entrepreneur as defined by the literature. These specific traits do not necessarily represent a comprehensive or definitional description of entrepreneurs. They do, however, appear repeatedly in economics, psychology, sociology, and entrepreneurship research, and they are representative of the personal characteristics necessary to meet the tasks and challenges of entrepreneurs. On the bases of this comprehensive review, three of the most common traits in entrepreneurs' success including the need for achievement, risk taking, and locus of control are chosen for this study.

Need for Achievement

The first and most frequently mentioned an entrepreneurial characteristic is the need for achievement. McClelland and his colleagues in 1950 (as cited in Collins, Hanges, & Locke, 2004) initiated the concept of need for achievement. They argued that high-need for achievement people are more likely than low-need for achievement people to engage in energetic and innovative activities that require planning for the future and entail an individual's responsibility for task outcomes. A few years later in another major research, McClelland (1961) argued that high-need for achievement people should also prefer tasks that involve skill and effort, provide clear performance feedback, and are of moderate challenge or risk. He stated that entrepreneurial positions have more of these characteristics than other types of positions. McClelland (1961, 1985) examined a number of needs that an individual was thought to acquire or develop as he or she develops. He focused on the behavioral outcomes of specific needs. He mentioned that one of the most widely studied needs is the need for achievement, and high-need for achievement people usually are growth oriented and are more likely to succeed.

Owens (2003) believed that individuals with high need for achievement normally have a propensity to situate critical aims and wish to make brilliance for themselves. This perspective is supported by Krauss, Frese, Friedrich and Unger (2005). In their review of individual characteristics, they have pointed out that performance of individuals, who have had high-need for achievement with no routine jobs were much better compared with others, moreover, they had responsibility for their performance.

Many studies have found that entrepreneurs generally have a higher need to achieve than non-entrepreneurs. Recently, in their seminal article, Collins et al. (2004) showed that, there is a significant correlation between need for achievement and performance of entrepreneurs. With this research, they supported McClelland's theory that, achievement motivation is significantly related to performance in entrepreneurial role. McClelland (1987) believed that from the viewpoint of need for achievement, there are significant differences between successful and unsuccessful entrepreneurs. He found empirical evidences relating achievement orientation to entrepreneurial success. Following McClelland's work linking achievement motivation to entrepreneurship, many studies have confirmed the relationship and need for achievement is largely accepted as a key trait of entrepreneurs (Bellu, 1988; DeCarlo & Lyons, 1979; Johnson, 1990). It has finally been shown that, the need for achievement (achievement orientation) of entrepreneurs increases the growth rate of their firm and small business.

As it is observed in previous studies, the need for achievement is one of the most important personality traits in entrepreneurs' success. In the present study, this personality trait is considered as one of the effective traits in entrepreneurs' success in small industries in Iran. In their study, Zali and Razavi (2009) posit the need for achievement as one of the most important traits in entrepreneurs' success receiving a high percent in their study.

The Iranian participant who took part in that study ranked this trait as the most important trait. It is clear that the need for achievement acts as a source of inspiration for entrepreneurs.

Locus of Control

In addition to the need for achievement, another personality trait as a psychological characteristic of entrepreneurs, that has been explored extensively, is locus of control. The locus of control construct is associated with how an individual perceives the causal locus of events (Owens, 2003). Previous empirical studies on field of entrepreneurship were undertaken by King (1985), Bonnet and Furnham (1991), Rahim (1996), and Muller (1999b) where they found entrepreneurs significantly have a higher rate of internal locus of control than managers. In another major study, Howell and Avolio (1993) investigating 78 managers in a large Canadian financial institution, and found that business-unit performance can be predicted optimistically and significantly with internal locus of control. Moreover, this theorem is supported by Gray (1999) who examined this trend in the situation of small business performance (success).

A recent study by Frank, Lueger and Kourunka (2007) confirmed that people with a strong internal locus of control are more adaptable at dealing with the pressures of work situations, more satisfied with their activities, and they can handle change more effectively. Locus of control has been used in literature to refer to an individual's perceived ability to influence the course of events coming up on the way of the individual's life. Individuals who are detected as possessing an internal locus of control believe that they have the ability to influence the outcomes of events via the appropriateness of their own behavior. In contrast, people with external locus of control hold the belief that external forces are in charge of determining the outcomes of events (Lee & Tsang, 2001).

Another study was conducted by Robinson, Stimpson, Huefner and Hunt (1991) in which they concluded that entrepreneurs had more internal control expectations than non-entrepreneurs. Further, many other researchers have reported evidences of a connection between an internal locus of control and entrepreneurship (Davidsson, 1991; Herron, 1994; Lee & Tsang, 2001). The initial conceptualization of the locus of control construct was uni-dimensional (internal vs. external) and has been repeatedly questioned (Lefcourt, 1981). Some studies have linked a belief in the internal control over the events in one's life to an individual's propensity to engage in entrepreneurial activities (Perry, 1990; Shaver & Scott, 1991).

Utsch and Rauch (2000) concluded that it is reasonable to expect that individuals who have confidence in their ability to control the events in their lives would be more motivated to actively seek new business opportunities instead of waiting for them to come. Locus of control measures generalized expectations about internal versus external control of reinforcement (Caliendo & Kritikos, 2008). People with an internal locus of control believe that they will determine their future development through their own actions. Persons with an external locus of control believe that their future outcomes, in terms of success and failure, are determined randomly or by the external environment, but not by their own actions. Accordingly, it is assumed that persons with an internal locus of control will be more successful as entrepreneurs than individuals with an external locus of control (Caliendo & Kritikos, 2008).

Previous studies have focused on the locus of control as both internal and external factors influencing entrepreneurs' success. In this study, the locus of control is considered as a whole and includes both internal and external factors. Despite the researcher's attempts, no previous research has been found regarding the effect of

the locus of control in Iran. This trait, as has been considered by many studies before, is taken into account in the present study. Determining the internal or external nature of this trait is also another important feature considering the strong religious background of Iranian entrepreneurs; however, this discussion is beyond the scope of the present study.

Risk Taking

The third entrepreneurial characteristics that will be discussed as a personality trait is the propensity for risk taking. According to Frank et al. (2007), as it has been observed in previous empirical findings, entrepreneurs with medium level of risk tendency can be characterized in ideal conditions, and always their uniqueness are higher than those of managers. Risk taking, both personal and financial, has traditionally been considered a defining characteristic of entrepreneurial activity (Timmons, 1994; Welsh & White, 1981). According to Owens (2003), a considerable amount of literature has been published on significant relationship between risk tolerance and entrepreneurship. Among others, Lumpkin and Dess (1996) assume a relationship of risk taking with success. Despite its good documents, Rauch and Frese (2000) believed that there is little and inconsistent empirical evidence for that relationship.

The literature delineates that successful owners probably have take calculated risks (Begley & Boyd, 1987; Timmons, Smollen, & Dingee, 1985). While taking calculated risks would largely reduce the probability of failure in the undertaken endeavor, a commonly positive perception towards risk taking is mandatory in an environment where risks are by any chance inevitable. It is emphasized that a positive perception of risk taking must help the owner of the entrepreneur to take on unavoidable (and often sought for) challenges and risks in building up success (Krauss et al., 2005).

Risk taking is the third and the final trait being considered in this study, affecting the entrepreneurs' success. Entrepreneurs have always been considered as risk taker individuals in the literature of entrepreneurship. Of course, it is worth mentioning that risk taking is not a part of the Iranian national culture (Zali & Razavi, 2009). However, since this trait has been considered as one of the most important traits, it is taken into consideration in the present study.

Empirical Studies of Personality and Entrepreneurial Success

Several studies have investigated entrepreneurship, yet there is still limited literature and empirical research reports on the determinants of entrepreneurial success in business or industry. It is probably reflecting the complexity of such research and the time required to carry out more significant longitudinal studies (Rogoff, Myung-Soo, & Dong-Churl, 2004). Sun (2004) believed that entrepreneurial success as a concept has evolved through the past, and these days, institutions such as banks and venture capitalists use financial facts as a measure of success. Riquelme and Watson (2002) have highlighted that most venture capitalists know the return on investment as a success. Besides, profitability (Devine, 2002; Sirinivasan, Woo, & Cooper, 1994), growth in employees (Chandler & Hanks, 1994; Covin & Covin, 1990), and sales growth (Smith, Bracker, & Miner, 1987) are crucial criteria for entrepreneurial success. In another study, Jenssen and Koenig (2002) have found that the establishment of a business and achievement of revenue can be defined as a success. Nevertheless, Aldrich and Martinez (2001), Fried and Tauer (2009) suggested that measures of entrepreneurial success should be multidimensional because of complexity of business environment. This view is further supported by Frese,

Brantjes and Hoorn (2002) and Paige (1999) who showed that entrepreneurial success include both tangible and intangible measures. Although, the intangible aspect of entrepreneurial success has received more emphasis (Aldrich & Martinez, 2001; Frese et al., 2002; Paige, 1999; Paige & Littrell, 2002).

The profit growth (profitability) is most cited with 23 studies, followed by employee growth with 22 citations, which is the second highest, followed by the sales growth with 18 works in the third place. The last but not the least, 14 scholars had focused on longevity of firm as a success. Surprisingly, it is encouraging to compare these findings with that found by Unger, Rauch, Frese and Rosenbusch (in press). The researchers looked into 70 studies in order to investigate human capital and entrepreneurial success and reported the same findings for definition of success, sales growth (16 items), employee growth (15 items), and profit growth (14 items). Majority of researchers accepted these common elements.

Hypothesis 1: There is a positive linear relationship between personal qualities and entrepreneurs' success in small industries in Iran.

National Culture

The term national culture has two meanings: First, every nation has its own mechanisms that confirm cultural patterns across generations, and the second reason for such difficulty arises from the reality that each nation has certain societal mechanisms that distinguish the cultural patterns of its own country from other countries (Mbeta, 2007). The most broadly cited operational definition and measures of national culture are from Hofstede (1980, 1984) who identifies four dimensions of national culture through a large-scale, empirical study examining 116,000 IBM employees in 72 countries between 1968 and 1972, which can be used to describe all cultures. He concluded that there are significant differences in the behavior and attitudes of employees across countries. Based on these findings, Hofstede developed the following four national cultural dimensions: power distance, uncertainty avoidance, masculinity/femininity, and individualism/collectivism, and later on he developed a fifth dimension, long-term versus short-term orientation.

Despite the criticisms which Hofstede's cultural dimensions have drawn, Sondergaard (1994) in providing support for Hofstede's dimensions states that Hofstede's framework for judging cultures shall remain the most established theory in the literature. He continues that, in order for thinking about cross-national differences in many aspects of organizational behavior the Hofstede's is reliable. This viewpoint was supported by Triandis (2004) who argued that the national culture dimensions have generated a incredible amount of highly influential research through all social sciences.

Hofstede's findings have been confirmed through many replication studies and "have been extensively used as a paradigm in articles of topics of inter-cultural relations" (Sondergaard, 1994, p. 453). However, his framework is still applicable to a number of recent studies which are intended to use culture as the main variable to explain the differences in international management behavior (Newman & Nollen, 1996; Pagell, Katz, & Sheu, 2005). Supporting this viewpoint, the GLOBE research program, which has been conducted by House, Hangs, Javidan, Dorfman and Gupta (2004), has examined culture as practices and values. Practices are acts or "the way things are done in this culture", and values are artifacts because they are human made and, in this specific case, are judgments about "the way things should be done". GLOBE research project has measured practices and values existing at the levels of industry (financial services, food processing, telecommunications), organization

(several in each industry), and society (62 cultures).

The dimensions of national culture in this major study are future orientation, gender equality, assertiveness, humane orientation, in-group collectivism, institutional collectivism, performance orientation, power distance, and uncertainty avoidance. Out of nine dimensions used in GLOBE research, six dimensions originally developed by Hofstede, and three dimensions try to examine new items. For the purpose of the current research, three new dimensions used in GLOBE research, performance orientation, assertiveness, and humane orientation will be used for testing national culture. The function of this study is not to carry out a cross-cultural study, rather to provide an in-depth understanding of entrepreneurship in a multicultural society with a widely different culture from western society. Table 1 compares the Iranian data with overall GLOBE data according to dimensions of national culture.

Table 1

Social Culture Dimensions

| No. | Dimension | Iranian data | | | Overall GLOBE data | | | |
|--------------|----------------------------|--------------|------|------|--------------------|------|------|------|
| | | Mean | S.D. | Rank | Mean | S.D. | Min. | Max. |
| 1 | Future orientation | 3.7 | 0.92 | 39th | 3.58 | 0.46 | 2.88 | 5.07 |
| 2 | Gender equality | 2.99 | 1.02 | 53rd | 3.37 | 0.37 | 2.5 | 4.08 |
| 3 | Assertiveness | 4.04 | 0.73 | 38th | 4.14 | 0.37 | 3.38 | 4.98 |
| 4 | Human orientation | 4.23 | 0.98 | 23rd | 4.09 | 0.47 | 3.18 | 5.23 |
| 5 | In-group collectivism | 6.03 | 0.57 | 3rd | 5.13 | 0.73 | 3.53 | 6.36 |
| 6 | Institutional collectivism | 3.88 | 0.93 | 49th | 4.25 | 0.42 | 3.25 | 5.22 |
| 7 | Performance orientation | 4.58 | 0.86 | 7th | 4.10 | 0.41 | 3.20 | 4.94 |
| 8 | Power distance | 5.43 | 0.93 | 19th | 5.17 | 0.41 | 3.89 | 5.80 |
| 9 | Uncertainty avoidance | 3.67 | 0.98 | 45th | 4.16 | 0.60 | 2.88 | 5.37 |
| Overall mean | | 4.28 | | | | | | |

Note. Source: House et al. (2004).

Performance orientation. The first dimension of national culture used in this research is performance orientation with using GLOBE research project definitions and concepts. As House et al. (2004, p. 239) stated, “performance orientation is the degree to which a society encourages and rewards group members for setting challenging goals, innovation, and performance improvement and excellence”. They focused on performance orientation as a separate cultural dimension. Performance orientation is an important dimension of a community’s culture that has not been sufficiently examined in past theoretical or empirical research. According to the GLOBE program researchers, performance orientation is related to high religious diversity.

The GLOBE research scholars argued that performance orientation was derived from McClelland’s (1961) work on need for achievement, with different measurements. According to McClelland, individuals with high-need for achievement have a propensity to achieve happiness from progressive improvement, they like to work on tasks with moderate probabilities of success because they represent a responsibility for their actions on how to do things better, and are normally innovative. He believed that active entrepreneurs and generated higher rates of economic growth are the result of better emphasis along with parents on teaching their children to have high standards and to value independence. In spite of observant request of performance orientation, the concept

of it has not received much attention in the literature. For example, in the best known cross-cultural study, that has been done by Hofstede (1980, 2001), the authors did not conceptualize or measure it as an independent cultural dimension. However, GLOBE project focused on performance orientation as a separate cultural dimension.

In the other side, performance orientation can be related to locus of control. Trompenaars and Hampden-Turner (1998) claim that societies are different in terms of their internal or external locus of control. The writers have found that people of many countries around the world make no attempts to control natural forces. They also have found that most of the people in the countries studied believe that what happens to an individual is their own doing, whereas some of the people in other countries, as addressed in their research, believe otherwise. Further, in the literature, it is stated that the internal locus of control as well as the belief in individual responsibility is related to some important societal as high standards of performance, and ambitious expectations (Hofstede & Bond, 1988; McClelland, 1961). Societies, such as Iran, whose respondents report strong performance, (according to GLOBE research data), tends to have specific distinguishing characteristics. They value education, training, and learning, emphasize results more than people, set high performance targets, value-taking initiative, and prefer explicit and direct communications. In contrast, societies whose respondents report low performance orientation are reported to value social and family relations, loyalty, tradition, and seniority, and use subtle and indirect language. Societal culture influences and regulates human behavior in the society. Cultural values and practices help identify socially acceptable and unacceptable behavior. Finally, the results reported in GLOBE research show that the societal norms in Iran support performance orientation, improvement, and excellence (Iran's score on performance orientation "as is" was 4.58, while the maximum score for all the countries was 4.94, Iran ranked 8th).

Assertiveness. One of the GLOBE research dimensions of societal practices is the assertiveness cultural dimension. The results of the GLOBE project show that assertiveness is an important aspect of a society's culture but like performance orientation, it has received relatively little attention in the cross-cultural literature. According to House et al. (1999), assertiveness is defined as the degree to which individuals in societies are assertive, tough, dominant, and aggressive in social relationships. In the literature assertiveness is sometimes illustrated as the midpoint on a continuum between nonassertive and aggressive behavior (Rakos, 1991). In addition, to the body of psychological assertiveness literature that focuses on assertiveness as a style of responding, there is also a body of literature that has examined assertiveness as a more stable personality trait (see e.g., Caliendo & Kritikos, 2008). According to this perspective, some people are naturally more assertive than others.

Literature shows that in terms of personality, high rather than low levels of assertiveness are linked to effectiveness and success. However, such studies are primarily based on western societies. Whether these results are similar in other cultures remains untouched. Assertiveness is also associated with the conventionalization of successful managers. Successful managers are seen as assertive, dominant, and honest.

According to the GLOBE research among scholars until now no body count assertiveness as a cultural dimension (with the exception of the study on stereotypical national characteristics by Peabody described above). The results also show that Iran scored in the lower range in the GLOBE research program sample for assertiveness "as is" (Iran's mean score was 4.04, which was the 24th country from lowest in the GLOBE list). That is, Iranians are less confrontational and aggressive in social relationships (the other countries, which scored close to the Iranian sample, were Canada 4.05, the Philippines 4.00, Slovenia 3.92, Ireland 3.92, and Taiwan

3.91). The lowest assertive nation was Sweden (3.38) and the highest was Albania (4.80).

Human orientation. As House et al. (1999) stated the human orientation cultural dimension is defined as the degree to which a society encourages and rewards individuals for being fair, altruistic, friendly, generous, caring, and kind to others. This dimension could be observed in the way people receive each other and in the social programs legislated and encouraged within each society. Research has shown that the way in which people delight each other depends on culture. However, the very basic conceptual foundations of the human orientation construct are established on an interdisciplinary perspective. This perspective includes a combination of organization studies, psychology, economics, philosophy, history, anthropology, political science, and theology.

Human orientation is defined as the degree of concern, sensitivity, friendship, tolerance, and support which are normally practiced at the societal, organizational, and leadership levels. Upon reviewing literature, it is stated that highly human-oriented behaviors might include behaviors like care, nurturance, and helping others. In the other side of the story, the low human orientated behavior may lead to promoting self-interest and lack of consideration. However, human orientation of societies is assumed to be closely related to the economic, physical, and psychological well-being of the members of the addressed society. Different societies, organizations, and leaders may reveal different degrees of emphasis on the breadth of support that is offered to others. As revealed by the GLOBE study results, less human orientation is observed in societies that are economically developed, modern, and urbanized. Furthermore, in societies in which physical conditions and climate create difficulties for well-being, there is higher humane orientation. Statistical analysis between GLOBE societal human orientation scores and physical climate indicates that in countries where there are difficult climatic conditions, there is higher solidarity and help among the citizens. On the other hand, it is true to assume that if preindustrial societies go through unexpected stressful conditions, human orientation decreases as the result. In Iran, human orientation, is a strong societal cultural norm in that being altruistic, friendly, generous, caring, and kind to others is highly emphasized and rewarded (Iran's score is 4.23 which is in the top 30% of the ranking of the 61 countries).

National culture and entrepreneurship. Bosma, Acs, Autio, Coduras, and Levie (2009) in global entrepreneurship monitor (GEM), in 2008 (Executive Report), pointed out that ten years of GEM research and quickly growing body of entrepreneurship studies show that entrepreneurial activity rates vary across countries for cultural reasons. Only a few empirical studies have examined the association between dimensions of culture and entrepreneurship and new firm formation rates at the national or regional level (Davidsson, 1995; Davidsson & Wiklund, 1997; Shane, 1992, 1993). These studies have suggested that cultures that further the higher need for autonomy, which is the need for achievement (McClelland, 1961), and self-efficacy (Bandura, 1986) will experience more firm-formation rates. By the same token, these values reward a strong work ethic and risk taking among the members of the society (Hayton, George, & Zahra, 2002). Another important issue that they found deals with the interactions between culture, institutional structure, and entrepreneurship, which have not been subjected to statistical analysis so far. Nevertheless, it is generally assumed that a complex relationship exists among cultural values, and entrepreneurship. This view is supported by Davidsson (1995) and Herbig (1994), where they clearly mentioned that researchers observe the relationships among these elements. However, these elements are complex and endogenous, such as social institutions, industry characteristics, and behaviors reflect and reinforce a culture's values.

In their seminal work, Hayton et al. (2002) reviewing the literature, yielded 21 empirical studies that have

focused on the association between national culture and entrepreneurship. This movement indicates a growing interest in this important but complex topic. Hofstede (1980) demonstrated that frequently studied dimensions of culture in the context of entrepreneurship are individualism collectivism, uncertainty avoidance, power-distance, and masculinity-femininity. The definitions of these four dimensions and their expected associations with levels of entrepreneurship have been widely covered in the literature (e.g., Herbig, 1994; Hofstede, 1980; Shane, 1992). Hofstede did not specify the relationship between entrepreneurship and culture; nonetheless, his dimensions are well-documented and useful in identifying criteria of culture related to entrepreneurship and explaining the behavioral preferences of people in business organizations. In general, it can be stated that researchers have assumed that entrepreneurship is facilitated by cultures (Hayton et al., 2002). Several other studies have attempted the inquiry regarding the relationship between national culture and entrepreneurial characteristics and traits. Meanwhile, these studies have been focusing on a diverse set of entrepreneurial motives, values, beliefs, and cognitions simultaneously (Hayton et al., 2002). Hayton et al. (2002) have realized that many of these studies take different approaches to the question of culture's consequences and treatments for entrepreneurship. They have reviewed the studies in search of the possibility of national culture be associated with different entrepreneurial characteristics or entrepreneurs are similar to or different from their non-entrepreneurial counterparts across cultures. Some other scholars such as Mueller and Thomas (2000) and Thomas and Mueller (2000) presenting some evidence have tried to prove that cultural values are significantly related to traits such as internal locus of control, risk taking, and innovativeness, which are associated with entrepreneurship.

It was only recently that scholars have started to associate the relationship of national culture with entrepreneurial, which are recognized as two key success factors in the increasingly competitive global economy (Atuahene-Gima & Ko, 2001; Baker & Sinkula, 1999; Barrett & Weinstein, 1998; Narver & Slater, 1990; Pothukuchi, Damanpour, Chio, Chen, & Park, 2002). Basically, scholars have a limited understanding about why entrepreneurially oriented firms are more successful in one country than in another (Shane, 1992). The theoretical insight for this contention is rooted in the managerial practice-culture congruity, or fit paradigm (e.g., Hayton et al., 2002; Hofstede, 1991; Neman & Slevin, 1993; Newman & Nollen, 1996) among others who suggest that managerial practices such as entrepreneurship should be aligned with national cultural demands to promote desired organizational outcomes.

Thomas and Mueller (2000) have stated that at the level of society, differences in entrepreneurial activities might be elaborated on by cultural and religious factors. McClelland (1961) hypothesized that socialization factors like parental influences help forming the need for achievement that in turn leads to an entrepreneurial inclination within a society. He predicted that societies with cultures emphasizing achievement would exhibit greater levels of entrepreneurship than societies who do not.

It is empirically investigated that "entrepreneurship is a culturally embedded phenomenon" (Lee & Tsung, 2001, p. 58). Further, it is believed that "socio-cultural dimensions influence the desirability to start a new business" (Begley, 1997, p. 1). These include a high value on innovation, risk taking, independence, high social status, and concern for failure or loss of face. Similarly, the need for achievement has the greatest impact for venture performance (Wennekers, 2001).

The GEM describes the creation of a new firm as a personal process including the recognition of opportunities, sufficient entrepreneurial potential, and the motivation to pursue an opportunity. The most

pressing socio-cultural issue is the society's attitude and support for entrepreneurship. This is the greatest inhibitor or enhancer of entrepreneurial activities (Reynolds, 2001). He further, for a country whose values do not support entrepreneurship, there is little appreciation of the entrepreneurial approach including self-confidence, self-reliance, personal drive and locus of control (Reynolds, 2001). It is concluded that a culture that rewards risk taking has a higher level of entrepreneurial activity.

Hypothesis 2: The relationship between risk taking and entrepreneurs' success can be moderated by national culture in small industries in Iran.

H2a: The relationship between risk taking and entrepreneurs' success can be moderated by human orientation in small industries in Iran.

H2b: The relationship between risk taking and entrepreneurs' success can be moderated by assertiveness in small industries in Iran.

H2c: The relationship between risk taking and entrepreneurs' success can be moderated by performance orientation in small industries in Iran.

Hypothesis 3: The relationship between need for achievement and entrepreneurs' success can be moderated by national culture in small industries in Iran.

H3a: The relationship between need for achievement and entrepreneurs' success can be moderated by human orientation in small industries in Iran.

H3b: The relationship between need for achievement and entrepreneurs' success can be moderated by assertiveness in small industries in Iran.

H3c: The relationship between need for achievement and entrepreneurs' success can be moderated by performance orientation in small industries in Iran.

Hypothesis 4: The relationship between locus of control and entrepreneurs' success can be moderated by national culture in small industries in Iran.

H4a: The relationship between locus of control and entrepreneurs' success can be moderated by human orientation in small industries in Iran.

H4b: The relationship between locus of control and entrepreneurs' success can be moderated by assertiveness in small industries in Iran.

H4c: The relationship between locus of control and entrepreneurs' success can be moderated by performance orientation in small industries in Iran.

Method

For the purpose of this study, a quantitative research design was a more appropriate choice rather than conducting a qualitative study to determine the knowledge associated with entrepreneurial success. Numerous studies have attempted the research approach (Chadwick, 1998; Owens, 2003; Paige, 1999; Solymossy, 1998; Sun, 2004; Toney, 1995). Out of the approximately 18,485 small industries in the list, a target of 600 respondents to the survey was calculated using a probability sampling method with using random numbers table. This research selected respondents from small industries listing provided by ISIPO, to survey 600 entrepreneurs who registered in this organization and located inside of industrial parks. Cronbach's alpha was used to assess reliability. Content and face validity were established by a panel of experts, consisting of management, and

entrepreneurship experts. The panel was asked to review the content of the items in the instruments and determine if the items were within the linguistic capabilities and understanding of industries owners and managers in Iran. An alpha level of 0.05 was set for all statistical tests unless otherwise stated. To test the hypotheses standard multiple regression and moderated multiple regression (MMR) were used.

Result

Descriptive statistics for the sample are presented in Table 2.

Table 2

Means, Standard Deviations and Correlations

| Variables | Mean | SD | GR | RT | NA | LC | HO | AS |
|-----------|------|-------|-------|-------|-------|-------|-------|-------|
| GR | 2.94 | 0.934 | | | | | | |
| RT | 3.43 | 0.703 | 0.509 | | | | | |
| NA | 3.44 | 0.714 | 0.557 | 0.856 | | | | |
| LC | 3.44 | 0.714 | 0.523 | 0.579 | 0.587 | | | |
| HO | 3.43 | 0.699 | 0.417 | 0.798 | 0.775 | 0.549 | | |
| AS | 3.52 | 0.713 | 0.398 | 0.779 | 0.762 | 0.530 | 0.987 | |
| PO | 3.57 | 0.739 | 0.306 | 0.657 | 0.639 | 0.461 | 0.840 | 0.854 |

Notes. All correlations are significant at the 0.01 level (2-tailed); GR: Growth; RT: Risk taking; NA: Need for achievement; LC: Locus of control; HO: Human orientation; AS: Assertiveness; PO: Performance orientation.

Averages for all independent variables are more than 3. Based on the above table the relationship between dependent variable (success in terms of GR) and predictor variables was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There were a strong positive correlation between the dependent variables in terms of growth and predictors; also, there were significant correlations among the independent variables and between dependent and independent variables. To test the hypothesis, multiple linear regression and moderated multiple regression were used. The results of multiple regression for test hypothesis 1 are reported in Table 3.

Table 3

Result of Regression Analysis

| Variables | Results |
|--------------|----------|
| RT | 0.013 |
| NA | 0.362* |
| LC | 0.313** |
| R^2 | 0.374 |
| Adj. R^2 | 0.363 |
| ΔR^2 | 0.374 |
| ΔF | 32.525** |
| F | 32.525** |

Notes. Standardized regression coefficients are reported; * $p < 0.01$; ** $p < 0.001$.

The predicts of entrepreneurs' success in terms of growth to find out the best set of predictors of success, a three predictors multiple linear regression model and enter method is proposed. The three predictor variables are risk taking (RT), need for achievement (NA), and locus of control (LC). Based on the enter method used only two variables (need for achievement and locus of control) were found to be of significance in explanation of entrepreneurs success. According to above table the largest beta coefficient is 0.362, which is for need for achievement. This means that this variable makes the strongest unique contribution to explain the dependent variable (success of entrepreneurs). It suggests that one standard deviation increase in need for achievement is followed by 0.362 standard deviation increase in success of entrepreneurs. The Beta value for locus of control is the second highest (0.313), followed by risk taking in the third place (0.013) which is the smallest and indicating that it made the least contribution. With reference to the model summary table obtained, the above model a good descriptor of the relationship between the dependent variable (success) and predictor variables (RT, NA, and LC). As the table shows R^2 is 0.374, so this model is acceptable model for explanation the relationship between dependent and predictors variables. According to this table, the R^2 of 0.374 implies that the three predictor variables explain about 37.4% of the variance/variation in the success of entrepreneurs. This is quite a good and respectable result in social science. The ANOVA table revealed that the F -statistics ($F = 32.525$) is very large and the corresponding p -value is highly significant (p -value = 0.0001) or lower than the alpha value of 0.05. This indicates that the slope of the estimated linear regression model is not equal to zero, confirming that there is linear relationship between success of entrepreneurs in small industries in terms of growth and three predictor variables, risk taking, need for achievement, and locus of control. Thus hypothesis 1 was supported.

To assess the hypothesized relationships, and for testing the moderating role of national culture, moderated multiple regression (MMR) with interaction terms was employed. The MMR procedure involved creating a new variable that consists of the product term between the independent and the moderator variable, and implementing a hierarchical multiple regression procedure. To capture the interaction between dimensions of national culture and personal qualities, each of the aspects of national culture was multiplied by personal qualities to create nine interaction variables. The hierarchical multiple regression required entering the control variables first, therefore, in the first step of the regression, each variable with main effect of each dimension was entered.

As Cohen and Cohen (1983), demonstrated main effect is entered first in a MMR model, not for the purpose of testing these effects, but rather to remove their effects from the cross product. They believed that, this is necessary because the cross product-term carries both main and interaction effect information. In the second step of the regression, the interaction terms were entered. The results can be seen in Table 4, Table 5 and Table 6.

Table 4 shows that for moderating role of national culture (human orientation, assertiveness, and performance orientation) on relationship between risk taking and entrepreneurs' success the overall models were significant. ($F = 30.78, p < 0.05$), $R^2 = 0.27$, and $F(2,169) = 30.78, p = 0.0001$, ($F = 30.02, p < 0.05$), $R^2 = 0.26$, and $F(2,167) = 30.02, p = 0.0001$, and ($F = 30.11, p < 0.05$), $R^2 = 0.27$, and $F(2,167) = 30.11, p = 0.0001$. The R^2 of 0.27, 0.26, and 0.27 imply that the risk taking; with main effect of human orientation, assertiveness, and performance orientation explain about 27%, 26%, and 27% of the variance/variation in the success of entrepreneurs.

In the second model, and after the product terms have entered, as shown in above table, increasing the R^2 of the model to 29%, 29%, and 28% and $F(1,168) = 5.16, p = 0.024$, $F(1,166) = 5.21, p = 0.024$, and $F(1,166) = 4.32, p = 0.039$ support the presence of moderating effect of three dimensions of national culture on relationship

between risk taking and entrepreneurs success. In other words, the moderating effect of human orientation, assertiveness, and performance orientation explains 2.2%, 2.2%, and 1.9% of variance in success increase above and beyond the variance explained by risk taking and national culture status. Thus, hypotheses 2a, 2b, and 2c were supported. Hence, the strong relationship between risk taking and success of entrepreneurs changes because of national culture.

Table 4

Result of Regression Analysis

| Variables | RT-HO | | RT-AS | | RT-PO | |
|--------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 |
| RT | 0.56 ^{***} | 1.18 ^{***} | 0.57 ^{***} | 1.20 ^{***} | 0.56 ^{***} | 1.13 ^{***} |
| HO | -0.057 | 0.61 | | | | |
| AS | | | -0.073 | 0.58 | | |
| PO | | | | | -0.65 | 0.47 |
| RT*HO | | -1.24 [*] | | | | |
| RT*AS | | | | -1.23 [*] | | |
| RT*PO | | | | | | -1.02 |
| R^2 | 0.27 | 0.29 | 0.26 | 0.29 | 0.27 | 0.28 |
| Adj. R^2 | 0.26 | 0.28 | 0.26 | 0.27 | 0.26 | 0.27 |
| ΔR^2 | 0.27 | 0.022 | 0.26 | 0.022 | 0.27 | 0.019 |
| ΔF | 30.78 ^{***} | 5.16 [*] | 30.02 ^{***} | 5.21 [*] | 30.11 ^{***} | 4.32 [*] |
| F | 30.78 ^{***} | 22.75 ^{***} | 30.02 ^{***} | 22.25 ^{***} | 30.11 ^{***} | 21.91 ^{***} |

Notes. Standardized regression coefficients are reported; * $p < 0.05$; *** $p < 0.001$.

Table 5

Result of Regression Analysis

| Variables | NA-HO | | NA-AS | | NA-PO | |
|--------------|----------------------|----------------------|----------------------|----------------------|---------------------|----------------------|
| | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 |
| NA | 0.62 ^{***} | 1.29 ^{***} | 0.63 ^{***} | 1.32 ^{***} | 0.61 ^{***} | 1.34 ^{***} |
| HO | -0.08 | 0.598 [*] | | | | |
| AS | | | -1.0 | 0.571 [*] | | |
| PO | -0.073 | 0.58 | | | -0.08 | 0.597 [*] |
| NA*HO | | -1.29 [*] | | | | |
| NA*AS | | | | -1.29 [*] | | |
| NA*PO | | | | | | -1.29 ^{**} |
| R^2 | 0.31 | 0.34 | 0.31 | 0.34 | 0.31 | 0.34 |
| Adj. R^2 | 0.30 | 0.32 | 0.30 | 0.32 | 0.30 | 0.33 |
| ΔR^2 | 0.31 | 0.025 | 0.31 | 0.026 | 0.31 | 0.031 |
| ΔF | 37.26 ^{***} | 6.1 [*] | 36.42 ^{***} | 6.22 [*] | 36.5 ^{***} | 7.5 ^{**} |
| F | 37.26 ^{***} | 27.64 ^{***} | 36.42 ^{***} | 27.16 ^{***} | 36.5 ^{***} | 27.81 ^{***} |

Notes. Standardized regression coefficients are reported; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

From Table 5, we can see that for moderating role of national culture on relationship between need for achievement and success of entrepreneurs the overall models were significant ($F = 37.26$, $p < 0.05$), $R^2 = 0.31$,

and $F(2,165) = 37.26, p = 0.0001, (F = 36.42, p < 0.05), R^2 = 0.31,$ and $F(2,163) = 36.42, p = 0.0001,$ and $(F = 36.5, p < 0.05), R^2 = 0.30,$ and $F(2,163) = 36.5, p = 0.0001.$ The R^2 of 0.31, 0.31, and 0.31 imply that the need for achievement with main effects of dimensions of national culture explains about 31%, 31%, and 31% of the variance/variation in the success of entrepreneurs. As can be seen in Table 6, in the second step, and after the product terms have entered, increasing the R^2 of the model to 34%, 34%, and 34% and $F(1,164) = 6.1, p = 0.015,$ $F(1,162) = 6.22, p = 0.013,$ and $F(1,162) = 7.50, p = 0.007$ support the presence of moderating effect of national culture on relationship between need for achievement and entrepreneurs success. In other words, the moderating effect of human orientation, assertiveness, and performance orientation explains 3.4%, 3.4%, and 3.4% of variance in success increase beyond the variance explained by each personal qualities and national culture status. Thus, hypotheses 3a, 3b, and 3c were supported.

Table 6
Result of Regression Analysis

| Variables | LC-HO | | LC-AS | | LC-PO | |
|--------------|----------|----------|----------|----------|----------|----------|
| | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 |
| LC | 0.41*** | 1.35*** | 0.42*** | 1.4*** | 0.47*** | 1.14*** |
| HO | 0.19* | 1.15*** | | | | |
| AS | | | 0.18* | 1.16*** | | |
| PO | | | | | 0.10 | 79** |
| LC*HO | | -1.69* | | | | |
| LC*AS | | | | -1.74** | | |
| LC*PO | | | | | | -1.15** |
| R^2 | 0.29 | 0.34 | 0.28 | 0.33 | 0.27 | 0.30 |
| Adj. R^2 | 0.28 | 0.32 | 0.27 | 0.32 | 0.26 | 0.28 |
| ΔR^2 | 0.29 | 0.045 | 0.28 | 0.048 | 0.27 | 0.027 |
| ΔF | 32.78*** | 10.73** | 30.81*** | 11.26** | 28.78*** | 5.88* |
| F | 32.78*** | 26.77*** | 30.81*** | 25.64*** | 28.78*** | 21.74*** |

Notes. Standardized regression coefficients are reported; * $p < 0.05;$ ** $p < 0.01;$ *** $p < 0.001.$

For moderating role of national culture on the relationship between locus of control, and entrepreneurs' success, as can be seen in Table 6, the overall models were significant ($F = 32.78, p < 0.05), R^2 = 0.29,$ and $F(2,159) = 32.78, p = 0.0001, (F = 30.81, p < 0.05), R^2 = 0.28,$ and $F(2,157) = 30.81, p = 0.0001,$ and $(F = 28.78, p < 0.05), R^2 = 0.27,$ and $F(2,157) = 28.78, p = 0.0001.$ The R^2 of 0.29, 0.28, and 0.27 entail that the locus of control with main effects of dimensions of national culture explains about 29%, 28%, and 27% of the variance/variation in the success of entrepreneurs. It can be seen clearly in Table 6, that in the second model, and after the product terms have entered, increasing the R^2 of the model to 34%, 33%, and 30% and $F(1,158) = 10.37, p = 0.001, F(1,156) = 11.26, p = 0.001,$ and $F(1,156) = 5.88, p = 0.016$ support the presence of moderating effect of national culture on relationship between locus of control and entrepreneurs success. Besides, the moderating effect of national culture explains 4.5%, 4.8%, and 2.7% of variance in success increase beyond the variance explained by locus of control and national culture status. Thus, hypotheses 4a, 4b, and 4c also were supported.

Conclusion

This study has started on empirically examining the relationship between personal qualities and entrepreneurs' success with moderating role of national culture in Iran. To the knowledge of researchers, there is no other published work that has addressed the same issues. The conceptual aspect of the national culture has been guided by the GLOBE project. The data were collected from 600 owners of small industries in Iran. The primary purpose of this paper was to examine the strength of relationship between the personal qualities of entrepreneurs and their success in small industries in Iran. The paper also reported and elaborated on the moderating role of the dimensions of Iran's national culture using three dimensions of GLOBE research. Although the relationship between personal qualities and entrepreneurs' success offers valuable approaching, it must be recognized that the strength of this relationship will depend on the national culture from which the firm originates. This study supports the proposition that national culture affects success of entrepreneurs. The significance of moderating effects of these three dimensions of national culture highlights the necessity for researchers to pay special attention to the national culture and social context of their research settings especially, in entrepreneurship context. The findings of this study have important implications for entrepreneurship researchers, entrepreneurs, and the governments in which small industries' operate. For researchers, the conceptualization of dimensions of national culture provides an important new tool in understanding success of entrepreneurial small industries. For entrepreneurs managing small industries, the results of this study indicate that at both individual level and national level factors will influence their success. Accordingly, governments have begun paying special attention to the needs and potential of these organizations by developing support mechanisms for small industries.

Throughout this article, we have noted significant issues for consideration in future research. Larger sample sizes using more dimensions of national culture and more complicated multivariate analyses are necessary for future studies of culture and collective measures of entrepreneurship. Future researchers can examine the moderating role of national culture on organizational functions of entrepreneurs in small industries with interaction between national and organizational cultures and their joint effect upon corporate entrepreneurship. We believe that these issues represent imperative tasks for scholars of entrepreneurship who are interested in a national culture's consequences in Iran. We hope that this review will contribute to the continued progress by encouraging researchers to further explore these interesting and complex issues. These preliminary findings of our work are a small step toward exploring such deep cultural values and background.

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Negotiating Enterprising Identities: African Woman Entrepreneur Stories of Challenge, Perseverance and Triumph

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Despite the entrepreneurship literature's vastness and depth, there is a gap between women's experiences of the phenomenon and what explanations traditional research is producing in academic settings. Influenced by the narrative turn and encouraged by pioneers who have proposed alternative approaches to studying entrepreneurial practices, this study adopted a novel conceptual lens through which to approach research on the phenomenon of entrepreneurship. The lens frames entrepreneurship as being socially constructed. This standpoint suggests that gender and entrepreneurship are enacted and situated practices, and shows how the codes of a gendered identity are kept, changed and sometimes challenged. This suggests that as well as being an economic phenomenon, entrepreneurship can also be read as a cultural one in order to understand how gender and entrepreneurship are culturally produced and reproduced in social practices. Ugandan case examples of how gender and entrepreneurship are performed on a daily basis are provided. In so doing, mechanisms through which gender and entrepreneurship are symbolically constructed are highlighted upon, and the attendant identity challenges for female entrepreneurs in Uganda are discussed.

Keywords: entrepreneurship, African woman, female entrepreneur, identity

Introduction

Women's contributions to the developing economies have been in the media spotlight recently. Moreover, the popular press, as well as academic and business publications, consistently portray entrepreneurship as an economic necessity within a modern economy, promoting structural balance, employment choice, economic growth and national and personal prosperity (Katz, 2000; Bosma, Jones, Autio, & Levie, 2008). Thomas and Muller (2000) argued that in advanced industrial nations entrepreneurship revitalizes stagnating industries, provides new jobs to compensate for employment problems created by corporate restructuring and downsizing, and generally enhances economic flexibility and growth. Similarly, Goffee and Scase (as cited in Green & Cohen, 1995) noted that entrepreneurship amongst women is a means to achieving material and personal success, gaining independence and control over products of their labour, and avoiding barriers they face in organizations.

In Uganda, men and women are connected through kinship relationships that, in turn, are nested in broader structural domains, such as ethnic groups and classes (Ssetuba, 2002; Tادria, 1987; Wakoko & Lobao, 1996). The values and beliefs generated by this system create gender differences in social behaviours, and at the same time reinforce and maintain the status quo in terms of economic and social relations. These distinctions are articulated in proverbs, jokes and myths, and in informal and formal discussions (Ssetuba, 2002).

In contrast to other African nations, where gender ideologies stress the role of women as both producers and reproducers (Overa, 2003), in Uganda, Tادria (1987) noted that a woman's worth is measured first in terms of what she can offer to family survival. That is, in terms of procuring and processing food. In addition, childbearing is considered an added advantage in marriage. Following this tradition, and as a result of the fact that a high proportion of women live in rural areas, over time Ugandan women have come to provide 60% of the labour force in the agricultural sector and account for over 80% of the labour force in food production (Uganda Bureau of Statistics, 2007).

According to Bantebya (1992), the analysis of the societal impact of colonialism on women's economic activities suggests that this system was more detrimental for women than for men. After all, as Tادria (1987) observed, in Uganda men became part of the money economy while the women remained in the traditional sector. More specifically, Tادria (1987) argued that the economy was demarcated into two ideologically-aligned sectors: a local sector dominated by women and characterized by the sale of agricultural produce and other commodities around the homesteads, and the external sector dominated by men (who migrate from their homes to engage in a variety of cash-generating activities). However, consciousness of discrimination by formal institutions has been on the rise in recent times in Uganda, and women's recent actions in politics (Goetz, 2002; Tamale, 1998; Tripp, 1999, 2001), entrepreneurship (Snyder, 2000; Walter et al., 2004) and finance (Guwatudde, 1994) have been acknowledged by scholars. It is even suggested that these actions have created changes in gender ideology and power relationships at both the social-structural, and the household levels (Wakoko & Lobao, 1996).

With the decline of agriculture in the 1970s, which had been dominated by men, women learned to work outside of their homesteads. Thus, the national resistance movement's (NRM) ascent to power in Uganda was critical for entrepreneurship because it provided an encouraging environment that came with stability. In spite of these successes, Ugandan feminists groups complain that in their countrywomen still have a long way to go before their efforts can bear any significant fruits. Although the Ugandan government has offered strong leadership in promoting women's rights—something the feminist groups admit—economic factors and the lack of supporting infrastructure continue to prevent women from achieving gender parity. In Uganda, women account for an increasing share of the self-employed, especially in small business activities (Walter et al., 2004; Uganda Bureau of Statistics, 2007), and there is a growing recognition of the role small business plays in building the country's economy. A look at the recent Uganda Business Register survey sheds more light on this. For instance, in the report on the Uganda Business Register of 2006/2007, the trade sector has the highest value added, namely, 735 billion Uganda shillings. In addition, most businesses in this sector are in the one to four employees size band. However, although the report revealed that women entrepreneurs are mainly to be found owning the small businesses employing between one and four persons, the report treats and characterizes women workers in the economy as a minority, and explains the differences between men's and women's businesses as a result of

women owners' lesser qualifications in terms of human, social and financial capital. This is paradoxical in the sense that women's progress in business ownership remains virtually invisible while a few demographic differences between men's and women's businesses are documented.

Similarly, Snyder (2000) observed that whereas women in Uganda now have the instruments for their political empowerment (enshrined in the 1995 constitution), women's economic power has not been boosted with similar positive policies and actions. Thus, such features make Uganda a particularly interesting place for research that addresses questions relating to experiences by female entrepreneurs. However, there is little research (apart from Bantebya, 1992; Snyder, 2000) offering insights into gender and working practices amongst entrepreneurs, and few studies examine entrepreneurship through the theoretical lens of gender as a social construction. This means that explanations of entrepreneurial experiences remain largely rooted in orthodox perspectives focused on comparisons of male and female entrepreneurs. Yet, such an approach does not illuminate how and why entrepreneurship came to be defined and understood in relation to the behaviour of only men.

The Study

The current study adopted a theoretical lens which frames entrepreneurship as being socially constructed (Chell, 2000). Through this lens, it is hoped that we can learn about the phenomenon of gender and entrepreneurship as intertwined processes. The social constructionist lens helps us to address the gap in entrepreneurship studies by focusing on doing business as a social practice and the sense-making associated with it. When asking questions that relate to meaning and interpretation, Dodge, Ospina and Foldy (2005) argued that narrative inquiry is an appropriate approach to address such issues. Thus, a narrative inquiry was chosen because its theoretical assumptions resonate with the current study's definition of entrepreneurship. That is, beginning with understanding that narratives of entrepreneurs do not objectively mirror reality, but are constructed in action, the current study views entrepreneurship as socially constructed.

Methodology

In this study, a choice was made to undertake a narrative type of inquiry because of three contributions that such an approach has been observed to make to research studies that emphasize interpretation, rather than prediction. First, it has been observed that narrative inquiry provides an internally consistent research approach when asking questions that relate to meaning and interpretation. Second, narrative inquiry is an appropriate methodology to capture complex interpretations of experience because it captures context and makes space for the multiple representations of various voices with a stake in the research (Dodge, Ospina, & Foldy, 2005). Finally, it taps into the unique kind of knowledge that is communicated through stories.

In order to implement narrative inquiry, a number of research techniques were used to generate stories about participants' entrepreneurial experiences. This meant that the researcher listened carefully to how the participants thought about their lives, and critically to how traditional social sciences scholars conceptualized women's and men's lives. In terms of specific techniques, the study utilized in-depth interviews and short life-story forms of interviewing.

The sampling strategy followed that of Byrne (2004), broadly described as a purposive approach. That is, the selection of participants was based on information derived from already available sources of data, such as

life-history documents relating to some of the participants. These sources were used to identify and locate appropriate participants who would then be approached and asked to participate. In some cases, snowball sampling (Byrne, 2004) was also followed. In the snowball strategy, some of the participants identified potential participants who were then approached by the researcher. As it has been observed in the literature, life-history research typically relies on small sample groups (Plummer, 2001). In this study, this meant that the participant sampling was based on considerations of data quality, rather than on statistical representativeness.

Consistent with the idea of co-production of knowledge (Dodge, Ospina, & Foldy, 2005) as a way to conduct research which incorporates the perspectives of stakeholders, views of key informants were also solicited. In this approach, five individuals who have particularly well-developed insights into the Ugandan situation and cultural context, and had the ability to articulate these insights, were included for their views on the subject. Information collected from all the sources resulted in a sample of 11 cases of entrepreneurs. A summarized profile of the entrepreneurs and their businesses is presented in the Appendix.

The current study made the following three assumptions that underpin three approaches to narratives discussed in this paper. The first assumption is that the stories of entrepreneurs tell about their experiences in their entrepreneurial activities give us access to the arguments, intentions, and meanings that support entrepreneurship (narrative as language). Secondly, entrepreneurship as practice is a legitimate source of knowledge from which to draw lessons about entrepreneurship, which can then be applied to other contexts (narrative as knowledge). The third assumption is that even though an entrepreneur may actively resist societal structures of power, those structures may influence their work, producing incongruence between discourse and practice (narrative as metaphor).

In analyzing and interpreting narratives generated during the research process, three assumptions guided the researcher's methodological choices and influenced the nature of the analysis that was carried out. Drawing on narrative as language, the researcher used stories about participants' entrepreneurial experiences as the primary source for exploring entrepreneurship practices. Life-story interviews facilitated the flow of stories and storytelling. Similarly, in order to tap into the wisdom of participants' tacit knowledge—so important to the narrative as knowledge approach—the researcher's emphasis was focused on access to the insights embedded in entrepreneurs' day-to-day practices. Finally, drawing from narrative as metaphor, texts were critiqued and deconstructed, rather than taking them at face value in order to decipher implicit shared meanings of the participants' narratives of their experiences, and possibly offering alternative interpretations of accepted views in entrepreneurship discourse. Integrating elements from all these approaches, the study combined formal narrative analysis, thematic coding, and deconstruction techniques to analyze the data.

Case stories in the study database fell into three main categories: bigmanship, African woman, and cultural entrepreneurship stories. These are briefly described as follows: bigmanship was a category of stories of a culturally idealized form of masculine character. Such stories came in two forms. In the first form, which was referred to as hegemonic masculinity, entrepreneurs in this category (cases 1, 3, 4, and 5) provided stories that were consistent with the idea of a male archetypical entrepreneur. In the second form there were stories that provided a defensive grappling with gender issues. That is, in their accounts (cases 8 and 11), emphasis was on gender neutrality as the criterion of fairness.

Women entrepreneurs' stories of challenges, perseverance and triumph constituted the second category

which is referred to as African woman stories. More specifically, African woman stories came in two forms: gendered identity and manoeuvring space stories. In the gendered identity story category, there is a certain tentativeness regarding the position of men in the female entrepreneurs' business lives. This is reflected in their (cases 9 and 10) views of the current gender order and the accommodations they have to make. Manoeuvring space stories (cases 6, 7, and 8) provide narratives of the ways in which gender is created and maintained in entrepreneurship discourse and practice.

Cultural entrepreneurship stories provide narratives that tell of the meanings that entrepreneurs attach to, and the strategies for, success they adopt.

Rather than presenting case materials relating to entrepreneurial experiences of all the cases in the study, narratives of selected cases are presented in the next section based on their potential to articulate issues relating to how female entrepreneurs negotiate identities in this part of the world. A detailed presentation and discussion of "bigmanship" and cultural entrepreneurship stories is beyond the scope of this paper. Interested readers can refer to Kikooma (2007).

Constructions of "African Woman Entrepreneur's Story" and Identity Challenges

This section presents cases of how female entrepreneurs negotiate identities and how the image of an African woman entrepreneur as complimentary opposite of her male counterpart is constructed.

Case Study 8: Alice Kwagala¹

Alice is the second of the only two women publishers in the country providing a service to Uganda's education system. Dedicated to the business of impacting on several generations to come through her services, Alice, the publishing manager of ABC Publishers Limited is committed to equipping young people with an education package through the primary school books her company publishes and she is very passionate about that idea the outcome of her services will be the foundation for the country. With experience from her former employer of seventeen years (Oxford University Press in Kampala), Alice teamed up with a business friend Alex Isabirye who had asked her to join him to start ABC publishers. This was after she had informed him about leaving Oxford University Press because things were not going very well for the Press not only because of the competition but that the education sector had been attacked by "a virus called corruption" and this was a problem because Oxford University Press could not compromise on quality and yet tender rules were increasingly being flouted.

To avoid any conflict of interest, Alice says the idea to start ABC Publishers had to wait until she left Oxford. The decision to leave Oxford did not take long. When it got to a point where it was like one had to do so much to be able to keep up, she parted company with Oxford and joined her partner to start ABC Publishers Limited.

"He didn't have expertise in publishing but he had the idea and the money. So I told him let me do it", she said. Although obtaining a first manuscript would have proved difficult, her experience and contacts that she had made while working with Oxford proved a distinct advantage that helped her get in touch with one of the authors (a head teacher of a school in the city) who had written a book for Oxford University Press.

"He had these stories for children and I thought why not start with those?" Alice recalls. The company was

¹ In the interest of confidentiality, the real names of entrepreneurs and their businesses have been disguised.

registered in 2002 and the first books came out in 2003 and so far they have come up with eight readers, with the ninth reader already gone to press while the tenth is about to be completed. Because publishing is quite capital intensive, Alice has been doing most of the work herself. “I would sit down and actually design the book, edit the text, send it back to the author for proof reading and approval, he would send it back so I would fit the text together with the art work, then I would come up with a hard copy and a soft copy and send it to the Printary because the Printary must also make a cover, then there you were. It took quite a lot of time. So many hours even on weekends”, said Betty, a mother of one child from her previous relationship.

Case Study 9: Christine Lugonvu

In Uganda, school proprietorship was not associated with profit making and therefore held little attraction for anyone contemplating to venture into the world of business. But for Christine Lugonvu, the founder and Headmistress of Najja Girls Secondary School and a number of others that followed, making profit was not her primary inspiration. Rather, she was driven by her work.

“My parents had always instilled in us a sense of pride and accomplishment, a need to be somebody. Given this impetus, I was not likely to do anything else in life. Besides, after going through the educational experience, Namagunga, Makerere (University), I felt that academia was my calling”, Christine told *The Sunday* vision.

As a trained educationist, Christine was rather concerned with the inadequacy of educational opportunities for girls in Kampala in the 1980s. For her, school proprietorship expanded the frontiers of education in Kampala, giving many girl children opportunities to acquire western education as a stepping stone to whatever the future held for them, and in the process, helping in the reproduction of the city’s social elite. Her husband, a very successful businessman was a bit taken aback at the idea of starting a school. While he thought it made good business sense, he thought it to be a daunting task. Nevertheless he did agree to raise the initial capital for the project and they begun to build in 1988.

Christine’s success with Taibah Girls Secondary School probably encouraged her to found other schools for junior learners.

“Well, I do believe that there are people who know the value of a good education and are fed up with this rat race of ‘okusomba abana’ (dropping and then picking up children from primary schools in and around the city). At the same time, I envision this as an up market school, where education will be something of critical importance. All too often our boarding schools tend not to be terribly particular on matters of food. So you see I will be offering the best of two worlds, during the week, kids will be away at school, they can be brought home and returned on Sunday. When you think about it one probably spends not even 8 hours with kids at home Monday to Friday, so I think the idea of my school is very timely”, said Christine of her new dream in an interview with the press.

Case Study 10: Deborah Kakembo

“After a year’s hard work, I was able to stand on my own feet”. Already a head teacher by the age of 19, Deborah Kakembo has grown from wage employment to a prize-winning entrepreneur. She is celebrated as the first Ugandan businesswoman (rather than trader) of the 1970s generation of entrepreneurs who survived the hard times of (former president) Amin’s era and the post-Amin civil wars and conflicts that immediately followed in the early 1980s. She believes that watching her mother make the best out of her poor circumstances, and her tenacity is what instilled in her a sense of discipline, responsibility and work ethic.

“I also believe I inherited my serial entrepreneurship from her. Watching her eking a living by a combination of many income-generating schemes must have laid a foundation for my entrepreneurship”. After a long career as a teacher, she said she had become tired of teaching and moreover, she felt that teaching made her stagnate in the classroom. Therefore, she looked for something to change the situation. One of the options she contemplated was to do a “full” degree or a diploma course. She applied and even attended some interviews for scholarships, but none came to fruition until a particular interview in which she was listed among the 25 people selected to study on an Israeli government scholarship in 1967.

A one-year course in hotel management in Israel marked the end of her long career as a teacher. She completed the course in 1968 and was awarded a junior certificate in hotel management and tourism.

On her return from her course in Israel, she was appointed as assistant executive housekeeper at Apollo Hotel in Kampala. In her new position she gained more administrative and management experience, and in 1971 when Apollo Hotel was merged with Uganda Hotels, she was promoted to executive housekeeper of all four hotels under the Uganda Hotels consortium. Deborah said that the role of executive housekeeper kept her extremely busy as she had to drive to all corners of the country to train staff on the job. However, although this job came as a personal achievement from her hard work, it soon became a frustrating experience and led to a personal struggle with her responsibility as a mother. In fact, by the end of 1972 she had decided to quit the job. But fortunately (if you wish), a search for an alternative to the physically-draining paid employment (from her experience with Apollo Hotel) did not take a long time as her resignation from Uganda Hotels coincided with (former president) Amin’s expulsion of Asians from Uganda.

As the executive housekeeper at Apollo Hotel, one of Deborah’s roles was to order flowers for the hotel, and through this she had met Mrs Hussein Begum who owned a flower shop along Kampala road. So when Amin decided to expel Asians, her friend Mrs Begum was looking for a way out as quickly as possible, and so she offered to sell her shop to Deborah, at a bargain price. Deborah borrowed some money from her husband and became the first African florist in Kampala. She renamed the shop Kampala Florist.

The new shop needed some capital injected into it to prosper and I had none. I began to think that maybe I had bitten off more than I could chew. With reluctance, I turned to my husband for help. Though he had been against my idea of leaving Uganda Hotels and of buying the flower shop, he indulged me and lent me three thousand shillings. With this money in my pocket, I travelled to Kenya on an Akamba bus.

She went to Nairobi in the hope of meeting someone who might want to trade with her. After being accommodated by her friend in Nairobi for a while, she found two flower farmers who agreed to sell and send flowers to her on a regular basis. After that there was no turning back for Deborah as her business grew.

After a year’s hard work, I was able to stand on my own feet. The flower shop was now a viable enterprise making a profit. I repaid my husband’s loan. Kampala Florist became synonymous with fresh beautiful flowers. For a long period of time it was virtually the only flower shop in the whole country.

Although the flowers eventually “withered” by 1985 as the civil war had devastated the economy by that time, it was through this business that she learnt bidding, negotiating and closing in business. Some of these skills were to be put to the test when, through a Japanese friend then heading Uganda Garment Industries Limited (a

subsidiary of Yamato of Osaka, Japan), she was introduced to the president of the company in Japan. The negotiations with Yamato International of Japan resulted in her importing over a hundred sewing machines and other equipment for a tailoring plant. She registered this business under a company name of Pop In Industries (U) Limited whose primary focus was to mass-produce ladies' and children's garments. At that time there was only one garment manufacturing plant in the country—the Uganda Garment Industries Limited (UGIL). She remembers those times passionately as the profits were quite handsome and she was able to realize a good income. But this was to be short-lived as her businesses went up in smoke in the melee of looting during the aftermath of the 1979 war.

However, as a woman who fights back, she was determined to continue with business and over the years she put up a bakery (Home Pride Bakery) and, more recently, went into furnishing and interior designing with Habitat Interiors and BasiX as the trademarks of her current businesses. The climax of her career, she said, came when the Star Group of California selected her, among others, as the best businesswoman of the year 1999.

This recognition was truly a (sic) pinnacle of my career and I will treasure the time I spent in Monaco (for the award ceremony) as long as I live. I was elated to realize that somebody out there had appreciated my indomitable spirit.

A closer analysis of stories from female entrepreneurs in this study suggests that although their world is male-dominated, there is a strong consciousness of change. For instance, whereas female entrepreneurs' conception of masculinity are still related to power², changes from older "bourgeois masculinity" conceptions (Connell, 1995) can also be detected. For instance, in Deborah's story there is a conscious endorsement of gender equity and a significant distance from the power-oriented form of masculinities prevalent in the "dominant entrepreneurship discourse" (Ogobor, 2001). However, the provisionality that is in nuances as much as in direct statements concerning the position of men in the female entrepreneurs' business lives, suggests that there is a certain tentativeness in their view of the current gender order in their context, and in the accommodations they have had to make to that effect. For instance, when asked about the role of her husband in any aspect of her business, Deborah replied that:

He was not involved apart from giving me the freedom to do what I wanted and the support with the family like when I would travel abroad for business. He was a gentleman and very understanding. He never stood in my way.

Another observation about this category of stories that needs to be mentioned is the apparent gender neutrality in the texts of case studies 2, 9, and 11. For instance case study 9 stated thus:

My husband is very supportive of my business and he is the one who gave me the start-up capital. I feel very guilty about not spending enough time with my family when I have to work long hours ... I believe that I would still have started a school without my husband as I have had the vision since I was 18 years old.

Riley (2001) sees the above gender neutrality as a "new sexism", i.e., a form of discourse which substantially facilitates patriarchy while apparently endorsing gender equality. This also has something to do with these entrepreneurs' view of their own identity as "women entrepreneurs" in a domain defined by features akin to maleness.

² Connell (1995) referred to this form of power based masculinity as bourgeois masculinity.

Female Entrepreneurs' Identity Challenges

The previous sections have provided evidence regarding how in telling stories of their entrepreneurial experiences, stereotypically masculine images and meanings are evoked. Here the author shows how in such a representation of their experiences, identity challenges for female entrepreneurs were discursively evoked. Informed by the assumption that individuals derive meaning for their identities from the social meanings available to them (Simpson, 1993), the issue of how female entrepreneurs locate themselves vis-à-vis meanings in association with the concept of "masculinity" is explored here.

In the example used here, an "ideological dilemma" (Stanley & Bilig, 2004) is obtained from narratives of case study 8 (the publishing manager of ABC Publishers), which concerns conflicting narratives on masculinity. According to Stanley and Billig (2004, p. 160), common sense contains contrary ideological values, and when people bring commonsense (everyday) explanations into argumentative conflict with each other, this constitutes what is termed as "ideological dilemmas". In narrating the story of how the idea of ABC Publishers came about, Alice (case 8) explained how the idea was a "brain child" of her co-founder, the director, and apparently a "brainy" lawyer. Emphasis on her association with intelligent people was found in her narratives of the groups she belongs to. Moreover, a close analysis of the interview text about this case also shows that she is uncomfortable (understandably, though) with the idea that in her line of business it is still a man's world.

This one I will be firm with you, in this corrupt world we are in, you find that sometimes it hinders progress because there are certain expectations that you cannot meet. Expectations like somebody wants to... you know, to like to take a bribe, or whatever, and then it is like they are not out to be able to tell you that. And they can't come out to say that we did this because you are a woman. And sometimes they do expect us to go out in the market and... probably it looks more of... like a man's world when it comes to that kind of thing. It is like we women... women are supposed to be seated somewhere and selling, but when it comes to marketing you have to move. You have to get out to the field... so that is one of the things. And then it is always like... like a very competitive world. It feels that... you feel kind of male chauvinism is still there.

The point made by the narratives of the above case study is that in narrating experience she is also "doing" gender in that her narrative practice is used to preserve a masculine image of an entrepreneur. Giving almost total credit to the male director for the idea of establishing the company subtly serves this purpose because, after all, it is "a man's world". In any case, in a competitive situation in which ABC publishers operates, Alice's narrative suggests that it demands people with "brains" to come up with ideas, and it is not surprising that she joined a group called "Freshman Limited" (who are mostly men) to tap their ideas. In this sense, she promotes the ideal representation of masculinity in the entrepreneurship discourse as an ability involving tacit "knowing how" (Bruni, Gheradi, & Poggio, 2004). After all, in a setting connoted as male territory (both case studies 6 and 8—and being the only female publishers in the industry—have made reference to this situation), the presence of a woman and her self-confinement within the bounds of the "female" (being the manager and not the director) attests to the authenticity of the process. Therefore, when she says it is still a male world, she is also respecting that gender order.

Making Sense of Female Entrepreneurs' Identity Struggles: The Social Construction of "Man" and "Woman" in Uganda

An interpretation of Alice's explanations above, which to some extent is also manifest in this study's other

female entrepreneurs' struggle to rescue a sense of autonomy, while narratively positioning themselves complementarily to men can be taken from Kalu's (1996) suggestions regarding how to use African traditional thought in order to analyze African women's understanding of duality of existence. In feminist discourse, gender duality is used as a backdrop against which the construction of gender ideologies in the particular contexts are analyzed (Overa, 2003). Consistent with Third World feminism critical of the construction of the Third World women by Western feminists, Kalu (1996) suggested that such a dual gender model is useful in the analysis of changes in the social construction of gender in Africa. After all, the model recognizes women's activism and the gender symmetry in pre-colonial times, but which deteriorated under colonialism. Kalu (1996) argued that most pre-colonial African societies functioned efficiently because the people thought through most of the issues and problems of their existence and were prepared by traditional wisdom to take charge of their world. According to Kalu's (1996, p. 283) argument, most African myths and legends place woman at the centre of, or at least as essential for, the existence of things: Within Igbo ways of knowing the world, the earth, Ala (ana or ali), is female.

Kalu (1996) thus argues that this way of knowing which is dependent on a discursive formation that insists on the harmonizing principle inherent in existence, asserts that the female exists not as a complement to the male, but as a complementary opposite of the male. Initially articulated in written and contemporary African literature by Chinua Achebe (1959, as cited in Kalu, 1996, p. 283) she argued that it presents itself as: "Whenever something stands, something else will stand beside it" (emphasis in original).

Analyzing and interpreting female entrepreneurs' stories in the study as a duality discourse here makes sense since the stories described in this paper are characteristic of such a view of the world in terms of gender complementarity (not necessarily implying equality). Thus, although some of the narratives in their life-stories presented their womanhood within discourses of marginalization, the aim here is to emphasize an "Africa" woman's complementary positioning framed within pre-colonial African discursive formation and its meaning for the present as Kalu (1996) attempted to. This is also inspired by what the elderly men and women told Tatria (1987) in her study among peasant farmers in Seguku and Ndejje in Uganda. According to Tatria's respondents, in the past, women's worth was measured more by their productive capacities. Hence, according to Tatria (1987, p. 86), when a young man was looking for a wife to marry, he would ask of the woman recommended, "wansi awunyawo?—Does she know about gardening?" An exploration of the meaning of this enunciated field of "Ganda³ discourse" (Ssetuba, 2002) reveals that to the Ganda man, the woman is a complementary opposite assuming not chronology or rank, but complementary positioning. This assumption is important, especially when one notes that within the western, and especially the Judeo-Christian tradition (the tradition most of contemporary Africa inherits through the colonialist discourse, especially in the sociopolitical mode (Kalu, 1996), the woman loses her place within African definitions of order, existence, and experience. Moreover, such a strategy makes sense given the way in which contemporary social transformation has impacted on the gender order globally (Connell, 1987, 1993, 2002). Thus, complementary positioning as a system of thought that maintains a sense of continuity and order when both production systems and gender roles change (Kalu, 1996) is a useful philosophical tool with which to explicate on the "African" discursive formation.

³ Ganda is one of the major tribal groupings in Uganda.

Reflection on Researcher-Researched Dynamics: The Man Question and Feminism

The author's involvement in the construction of the research product was not of the nature of a disinterested observer in the research process. The author's reflections on what happened in the process are also important. Perhaps this is best exemplified in the author's experiences as a (male) researcher engaging in feminism. In the process, the author also became more aware of the sexed and gendered boundaries one encounters while claiming a feminist space from which to work. In this respect, the author engage in some reflection about The author's own experiences as a "man doing feminism" given the author's background, partiality, investments, and perhaps limits of knowledge as the author tried to deal with the realities of what Pillow (2000) termed the man question in feminism.

Feminist theory has been vocal about the need to acknowledge, reflect on, and critically engage "the politics of the gaze in our research" (Pillow, 2000, p. 546). Moreover, as Hamilton (as cited in Carter, 1993, p. 151) observed, the interest in women and small business ownership as a research topic in its own right has occurred mainly because "a degree of solidarity has taken place through the actions and deliberations of (female) scholars who, through a feminist analysis of the social construction of women's position in society, have been able to explore the subjective nature of male cultural domination". However, the author's "feminist leanings" (i.e., in terms of a male researcher "doing feminism" (Pillow, 2000, p. 545) could be understood in terms of the author's commitment to conducting research on business activities which give meaning to the author's personal experiences as the son of a woman who was also involved in similar activities when the author was growing up as a young boy in the countryside in Uganda.

Did gender matter in the process of this research? The author thinks he can answer this with a qualified yes. The author's encounter with feminist theory and practice, he must acknowledge, changed and challenged him personally, methodologically and theoretically. As Pillow (2002) suggested, in research gender seems to have a haunting presence. Whereas Riessman (1987) observed that conducting studies with people with the same gender categories may constitute both a spoken and unspoken bond between the researcher and the researched, enabling certain things not only to be said and understood and also to be joked about, the author's experience with some of the female entrepreneurs presented other difficulties as the following extracts from interviews with two female entrepreneurs demonstrate.

Case Study 6: Rose

But as you know, majority of the people are men and some of them are lustful men. You are a man. You know you men have a lot of lust. So, that is there, but you have to develop skills to deal with these issues... Sometimes they are not receptive in terms of conversations, meetings, etc.. Sometimes you had to assert yourself in order to be heard.

Case Study 8: Alice

Researcher: What issues relating to gender and culture, if any, have affected your business? Betty: Hmm, I think probably because... this one I will be firm with you. In this corrupt world we are in, you find that sometimes it hinders progress because, eh, there are certain expectations that you cannot meet. Expectations like somebody wants to... you know, to like, to take a bribe or whatever, and then it is like they are not out to be able to tell you that. And they can't come out to say that we did this because you are a woman (emphasis added).

There are assumptions about men and the privileged male position that were at play in the author's

interaction with these female entrepreneurs. For instance, the author had to probe further before he could understand that when Rose stated “men have lust” she expected him to understand that this lust bears directly on the business interaction with other men, even in meetings, and this meant that the women had to assert themselves in order to deal with it. Similarly, the author’s being a man listening to a woman (Alice) narrating her experiences about some of the men she interacts with in the course of her business endeavours, the author was expected to understand that the bribe men wanted to take from her involved more than financial misappropriation. Although when one reads her extract above, it may present no apparent problem, and the ambiguity with which Betty talked about the topic during the author’s interaction with her in that interview is even more complicating. Men studying women raises particular issues concerning interviewers’ and interviewees’ social locations and subjectivities (Reinharz & Chase, 2003). The above examples suggest that the respondents may be trying to engage in some bonding around a common identity. In such bonding ploys, subjects may have a moral identity at stake, and may for that matter wish to avoid stating some things explicitly (Swalbe & Wilkomir, 2003).

In this study, entrepreneurial stories have been presented and discussed for their potential to illuminate the phenomenon of entrepreneurship in discourse and practice. In this respect, entrepreneurial experiences reported have been used to highlight the world of the entrepreneur. However, the author must acknowledge that as a researcher the author’s world view is distinct from that of the research participants’ (female or male), although the author’s writing is here used to bring their knowing into view. After all, as Richardson (1994) noted, in the act of writing, a researcher employs a style, a vocabulary and a set of metaphors which further modify data and theory.

Conclusions

A social constructionist perspective suggests that in order to understand any phenomenon, such as entrepreneurship, we must understand the way it plays out in particular contexts for particular actors. In this paper, an effort has been made to analyse the processes of “doing” entrepreneurship through a focus on the life-story narratives of entrepreneurs themselves. It is the case from the discussions in this paper that, like other cultural artefacts, entrepreneurial stories provide both explanations of, and rationales for entrepreneurial activity.

The exemplar cases provided in this paper suggest that because of the manner in which women and men perform economic activities and their choice of business, women and men position themselves in ways that help them negotiate realities in their social and business encounters at the interface. The cases demonstrate that the manner in which gender relations are embedded in the local economy is crucial for the opportunities and constraints of female entrepreneurs in which their complementary positioning has been a device for avoiding conflict and chaos in a situation where they (female entrepreneurs)—as new actors—have obtained economic power.

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Appendix: Characteristics of Entrepreneurs and Their Businesses

| Case | Gender category | Marital status | No. of children | Age | Education | Employment history | Start-up | Business | No. of employees | Entrepreneurial category |
|---------------|-----------------|----------------|-----------------|-----|--|---|--|--|--|--------------------------|
| Case study 1 | Male | Married | 9 | 60 | Little formal education | Business apprenticeship through working in father's shop as well as from father's business friend | Started through selling simple merchandize | A range of undertakings in transport, manufacturing, motor vehicle distribution, commercial farming, electronic media and property development | Over 500 | Large |
| Case study 2 | Male | Married | 2 | 65 | Diploma in business administration | Assistant District Commissioner | Partner Contributed | Manufacturing, Insurance and Banking | 100-200 | Large |
| Case study 3 | Male | Married | - | 67 | - | Started as small business trader | - | Manufacturing, processing | Over 600 | Large |
| Case study 4 | Male | Widowed | - | 56 | Secondary school education | salesman, sales supervisor, manager | Trading in small merchandize abroad | Hotel, leisure, private radio station | over 200 | Large |
| Case study 5 | Male | Married | - | 70 | - | Worked with father in family business | Family business | Sugar processing, tea and cotton ginning, beer breweries, textiles, plastic, glass, packaging and safety matches business | At its pinnacle, the family business consortium employed more than 20,000 people | Large |
| Case study 6 | Female | Married | 2 | 47 | Bachelor of arts in humanities | Jobs in a number of organizations abroad | loan from bank | Publishing | 7 | Medium |
| Case study 7 | Female | Widowed | 4 | 49 | Post-secondary school education | Restaurant and food business, farming | - | Transport | - | Micro/Small |
| Case study 8 | Female | Single | 1 | 43 | Master in information science | Publishing manager—OUP in Kampala | Partner contributed | Publishing | 4 | Micro/small |
| Case study 9 | Female | Married | 2 | 41 | Masters in Education | Various teaching posts in schools | Initial capital from husband | School proprietorship | 200 | Medium |
| Case study 10 | Female | Widowed | 6 | 70 | Certificate in Junior Hotel Management and Tourism | Teacher, hotel housekeeper, trainer | Initial capital from husband | Garment industry and interior design | Over 45 | Medium |
| Case study 11 | Female | Married | 6 | 47 | B.Sc. in Agriculture | Agriculture officer | Partner contributed | Shoe making | 10 | Medium |



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