

REVIEW OF ECONOMIC AND BUSINESS STUDIES

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RESEARCH ARTICLE



EQUITY CROWDFUNDING SUCCESS: AN EXAMINATION OF TITLE II OFFERINGS

SUZANNE K. HAYES*, BREE L. DORITY**, SARAH J. BORCHERS***

Abstract *Equity crowdfunding (ECF) is a relatively new financing model in the United States (U.S.). Many investors and small business owners are exploring this new avenue of capital formation; however, it is a research area that is relatively unexplored due to the limited availability of data. This paper examines factors related to campaign funding success for companies seeking capital under Title II of the JOBS Act. Using a Tobit regression we find that firms which report their equity capitalization raise a higher percentage of their campaign ask. A lower minimum target amount is identified as a second factor related to funding success. This study also shows that firms not reporting a tagline raise a larger percent of their offer, underscoring the importance of quality text descriptions. In addition, we find that economic conditions such as equity market sentiment are important to ECF success.*

Keywords: *equity crowdfunding, JOBS Act, Title II, ECF campaign success*

JEL Classification: *G11, G10*

1. INTRODUCTION

Transforming ideas into new business ventures can be a costly endeavor. In the past, entrepreneurs relied on angel investors and venture capitalists for funding. Crowdfunding is a new form of financing, increasing in use as both a substitute and a complement to angel and venture investments. It has been defined as “an open call, essentially through the Internet, for the provision of financial resources either in form of donation or in exchange for some form of

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reward and/or voting rights in order to support initiatives for specific purposes” (Schwienbacher & Larralde, 2010). Crowdfunding has grown exponentially in the past decade as a new financing mechanism for start-up companies. In 2017 alone, \$17.2 billion was raised through crowdfunding platforms in North America. This accounts for approximately half of the \$28.8 billion raised globally (Szmigiera, 2019). Peer-to-peer lending represents the largest portion of the overall crowdfunding market, followed in size by donations/rewards and equity crowdfunding (ECF). Of the total amount raised through crowdfunding globally, approximately \$2.5 billion was raised via equity crowdfunding campaigns (United States Securities and Exchange Commission [SEC], 2019). Until recently, United States entrepreneurs were not able to gain funding through internet-based ECF. Despite the regulatory hurdles, the U.S. ECF shows early sizable growth. An estimated \$1.4 billion has been raised by entrepreneurs from accredited investors via equity crowdfunding platforms since the passage of Title II of the JOBS Act in 2013 (Mamonov, Malaga & Rosenblum, 2017).

Due to prior U.S. regulations, most of the research to date on crowdfunding has been done on countries outside of the U.S., leaving research on equity crowdfunding in the U.S. in its early stages of exploration. To our knowledge, only a handful of studies have been done on equity crowdfunding in the U.S. (Mamonov et al., 2017; Malaga, Mamonov, & Rosenblum, 2018; Mamonov & Malaga, 2019(1); Mamonov & Malaga, 2019(2)). These projects provide descriptive statistics (Malega et al, 2018) or focus on specific portions of U.S. ECF such as real estate (Mamonov et al, 2017) or use relatively small samples (Mamonov & Malaga, 2019(1); Mamonov & Malaga, 2019(2)).

In this paper, we conduct the first in-depth analysis of Title II ECF in the US by exploring the determinants of success for more than 3,200 Title II crowdfunding campaigns across 12 intermediary platforms. Our analysis reveals the importance of equity market conditions and company factors such as prior market capitalization and taglines. The results have both academic and industry applications. Our study advances the nascent research stream on U.S. equity crowdfunding and discovers information important for early-stage entrepreneurs seeking capital under ECF.

We begin the paper with a description of ECF and a review of equity crowdfunding literature. The data and methodology are discussed next, followed by the results section. An overview of future research and a summary conclude the paper.

2. EQUITY CROWDFUNDING

2.1. DESCRIPTION AND LEGISLATIVE BASIS

Although equity crowdfunding has been established in other countries for over a decade, until recently, ECF was not an option in the U.S. Currently, under federal securities law, there are three primary options available in the U.S. for firms seeking capital from the crowd. Companies may select from Regulation A+; Title II, Regulation D Rule 506(c); and Title III of the JOBS Act, Regulation Crowdfunding. These options are summarized in Table 1.

Table 1. Crowdfunding Options in the United States

	Regulation D, Rule 506(c)	Regulation A+	Regulation Crowdfunding
Title of the JOBS Act	Title II	Title IV	Title III
Effective Date	September 23, 2013	June 19, 2015	May 16, 2016
Investors Allowed	Accredited investors only See also note [A]	Accredited and non-accredited investors	Accredited and non-accredited investors
Marketing of Securities	General solicitation	General solicitation	Limited to a brief notice if advertising off of the intermediary's platform. Can communicate with investors and potential investors about the terms of the offering through communication channels provided on the intermediary's platform.
Security Type	Restricted	Unrestricted	Generally restricted
Offering Limit	None	Tier I: limit of \$20 million within a 12-month period Tier II: limit of \$50 million within a 12-month period	\$1.07 million within a 12-month period See also note [B]
Review Requirements	None	Tier I: SEC and state-level review Tier II: SEC	Disclosure by issuers is required (Form C)
Ongoing Reporting Requirements	None	Tier I: None Tier II: Semiannual and annual reports with the SEC after the offering	Progress updates (Form C-U) and annual reports (Form C-AR)

- [A] An individual “accredited investor” has: (1) A minimum of \$200,000 in earned income (\$300,000 when combined with a spouse) in each of the two prior years and a “reasonable expectation” of a repeat in the current year, or (2) \$1 million or more in net worth, not including primary residence.
- [B] There are also limits on the amount individual investors can invest across all crowdfunding offerings in a 12-month periods: (1) If investor’s annual income or net worth is less than \$100,000, the limit is the greater of: (a) \$2,000 or (b) 5 percent of the lesser of their annual income or net worth, (2) If an investor’s annual income and net worth are equal to or more than \$100,000, the limit is 10 percent of the lesser of their annual income or net worth, and (3) During the 12-month period, the aggregate amount of securities sold to an investor through all crowdfunding offerings may not exceed \$100,000.

Source: U.S. Securities and Exchange Commission

The effective date of Title II of the JOBS Act is September 23, 2013. This legislation repealed the ban on general solicitation of securities offerings to accredited investors. Rule 506(c), Regulation D, allows advertising and marketing of securities, with no limit on the amount of the offer, to accredited investors only. Issuers are required to verify the accredited status, either individually or through the intermediary. Individuals may be classified as accredited investors if at least one of the following criteria is satisfied. First, an individual alone, or jointly with a spouse, must show a net worth of \$1 million at the time of the security purchase. Net worth is calculated independent of the primary residence value and related debt. Accredited status may also be achieved with income. Individuals with income over \$200,000 in each of the preceding two years, or income jointly with a spouse of at least \$300,000, may qualify as accredited, provided there is a reasonable expectation that the income level(s) will continue during the current year (SEC, 2016).

In 2015, the JOBS Act was expanded to include Title IV, Regulation A+. This provision expands the investor base to include non-accredited investors and introduced offer limits. Under Reg A+ issuers may raise up to \$50 million. Offerings under Tier I have a limit of \$20 million within a 12 month period and investors are not limited in their commitments. Tier II offers allow up to \$50 million, in a 12 month period, with investor commitment limits. Issuers may advertise and face no limits on the type of investor solicited (SEC, 2016).

Title III of the JOBS Act, Regulation Crowdfunding, also allows ECF participation by non-accredited investors and imposes individual investor commitment limits. Firms may solicit up to \$1.07 million via ECF over a 12 month time period under this provision with an effective date of May 16, 2016. This amount is subject to inflation adjustments by the SEC on a five year basis. Offers must be conducted through an intermediary operating as either a broker-dealer or

funding portal that is registered with the SEC and Financial Industry Regulatory Authority (SEC, 2016).

2.2. LITERATURE REVIEW

The financial crisis of 2007-08 led to a constricted capital supply and difficult conditions for early – mid stage startup firms. The JOBS Act relaxed the rules for public solicitation of funds and provided exemptions from costly SEC registration. This Act aimed to stimulate economic growth by improving access to public capital markets. Because equity crowdfunding has many similarities to venture capital and angel investing such as motives for investing, funding through shares, and an absence of active intermediaries, it is beginning to provide an additional source of funding for entrepreneurs (Lukkarinen, Teich, Wallenius, & Wallenius, 2016).

Funding success is arguably the most widely researched area in ECF and the equity crowdfunding success literature can be broken down into three distinct categories of characteristics: campaign characteristics, networks, and understandability of the company's concept and offering. Campaign characteristics include factors such as the funding target, the minimum investment required, the length of the campaign, and the availability of financial statements (Lukkarinen et al., 2016). Typically, a campaign is set up with a target amount of funding. Prior literature shows that the lower the funding goal and/or the lower the minimum investment required, the higher the probability of success (Block, Hornuf, & Moritz, 2018; Cordova, Dolci, & Gianfrate, 2015; Lukkarinen et al., 2016). Further, entrepreneurs who sold a smaller fraction of their companies at listing and had more social capital, experienced a higher likelihood of success (Vismara, 2016). Like funding amounts influence a campaign's success, the length of the campaign also impacts the probability of success where campaign success is more probable in shorter durations. Results indicate contributions are highest in both the beginning of the campaign and also the end. This suggests that the middle, inactive stage of the campaign should be shortened for increased success (Cordova et al., 2015; Harkonen, 2014).

Along the lines of campaign characteristics and success, there is a small stream of literature on the effects of gender on success. Malaga et al. (2018) studied the impact of gender on crowdfunding campaigns in the U.S. Their findings suggest women entrepreneurs are underrepresented in equity crowdfunding platforms as compared to their participation through angel investments, suggesting there is potential for women-owned companies to raise capital via equity crowdfunding platforms. Further, in a United Kingdom-based study, in both rewards-based studies and equity-based studies,

although women are underrepresented on crowdfunding platforms, they experience higher success rates in fundraising (Horvat & Papamarkou, 2017).

In previous literature, success is most frequently defined as the venture's ability to attract greater than or equal to their minimum funding target (Colombo, Franzoni, & Rossi-Lamastra, 2015; Horvat et al., 2017; Malaga et al., 2018; Mamonov et al., 2017; Yan, 2015;). However, other measures of success have included the number of investors attracted, the percentage of the capital campaign raised, or the amount of capital pledged during a campaign on a given day (Block et al., 2018; Colombo et al. 2015; Vismara, 2016).

3. DATA & METHODS

3.1. Data

This paper examines data on business equity offerings under Regulation D, Rule 506(c). The dataset covers 506(c) offerings from private businesses seeking public funding from accredited investors. Data is from the inception of Title II of the JOBS Act on September 23, 2013 through September 23, 2016. Equity data is provided by Crowdnetic Corporation. The following intermediaries are included in the dataset: Alchemy Global, AngelList, Crowdfunder, EarlyShares, EquityNet, MicroVentures, OneVest, OurCrowd, Return on Change, Seed Equity, SeedInvest, and WeFunder. This research is based on 3,222 equity offerings with a closed status. Open equity offerings and those with incomplete information are removed from the sample.

3.2. Model

To examine factors that are related to successful equity-based crowdfunding, we estimate equations of the following form:

$$p_raised = \beta_0 + \beta_1(Company) + \beta_2(Market) + \beta_3(Region) + \beta_4(Sector) + \beta_5(time) + \varepsilon \quad (1)$$

The dependent variable, *p_raised*, is the percent of the minimum target amount sought that was raised. We use the percent raised rather than a 0-1 variable for the total amount raised because it is rare for a project to raise 100 percent of the funds via equity-based crowdfunding in the U.S. That is, in our sample only 2.0 percent of companies successfully raised 100 percent or more of the funds they sought. This differs from efforts made to raise capital via loan-based crowdfunding. Hayes (2017) examined factors related to successful loan-based

crowdfunding and overall 16 percent of her sample raised 100 percent or more via loan-based crowdfunding, and Mamonov et al. (2017) focused specifically on real estate lending where the success rate was 88 percent.

Also, a nontrivial number of companies raise 0 percent of the funds sought via equity-based crowdfunding. Thus, given the percent raised distribution is spread out over the range of percentages from 0 to over 100 percent but piles up at the value 0, we use a Tobit model to estimate equation (1). The Tobit model is designed to model corner solution dependent variables and produces consistent coefficient estimates (Wooldridge, 2002). Finally, when obtaining the error covariances, we cluster by sector to allow for unobserved effects within industry sectors.

The vector of company-specific variables (Company) is limited to what is provided by Crowdnetic Corporation. The dataset captures the minimum target amount sought by the company, whether the company is owned/managed by a woman, whether the equity capital position is reported by the company, and whether the company used a tagline to help inform investors about the company. Prior research shows that (1) the lower the minimum target amount is, the higher is the probability of successful funding (Block et al., 2018; Cordova et al., 2015, Lukkarinen et al., 2016,); and (2) women entrepreneurs tend to be underrepresented in equity crowdfunding platforms (Malaga et al., 2018) but have experienced higher success rates on UK-based equity crowdfunding platforms (Horvat et al., 2017). Prior equity capitalization is a proxy for firm age as companies reporting relatively sizable capitalization levels have likely been in business for a period of time before making the current equity offering. A tagline is a short description of the company's project and indicates that more information is provided to investors.

The vector of market related factors (Market) captures standard indicators of economic activity and market sentiment and includes the monthly percentage change in the consumer price index, the monthly return on the S&P 500 index, and the average monthly Chicago Board Options Exchange Volatility Index (VIX) value. The VIX is often referred to as the fear index with higher values indicating times of greater uncertainty. We also control for the geographic region of the company location and the sector in which a company operates. Overall, companies are located in 49 states plus Washington D.C. and Puerto Rico (none are in Alaska), and in all eight sectors. Finally, we control for time effects with a quarter-year trend. When Title II of the JOBS Act became effective in the third quarter of 2013, companies rushed to seek funds from accredited investors; however, this tapered over the years as relatively few Title II equity crowdfunding campaigns resulted in a fully financed project.

4. RESULTS

4.1. Descriptive Analysis

Definitions, means, and standard deviations for all variables included in the Tobit regressions appear in Table 2.

Table 2. Definitions, Means, Standard Deviations

Variable	Definition	Mean	Std. Dev.
p_raise	Amount of total commitment relative to target amount (%)	7.9535	23.6245
<i>Independent Variables</i>			
issuea	Target amount (in \$millions)	2.3160	39.3232
w_owne d	0-1 if company is owned by a woman	0.1713	0.3768
w_mngt	0-1 if company is managed by a woman	0.1853	0.3886
r_equcap	0-1 if prior equity capitalization is reported by the company	0.6356	0.4813
tagline	0-1 if company used a tagline	0.8849	0.3192
chgcpi	Monthly percentage change in the consumer price index	0.0001	0.3073
sp500	Monthly return on the S&P 500 Index	2.2610	2.6641
vixlevel	Average monthly Chicago Board Options Exchange Volatility Index (VIX) value	14.338 6	2.2295

Sample size is 3,222.

On average, companies raised 8.0 percent of the minimum target amount and sought to raise a minimum amount of \$2.3 million. About 17 percent of the companies are owned by a woman and about 19 percent are managed by a woman. Also, about 64 percent of the companies report their prior equity capital level and 88 percent use a company tagline. On average, over the time period examined from 2013 to 2016, consumer prices increased 0.0001 percent each month and the monthly return on the S&P 500 was 2.3 percent per month. The average monthly VIX value was 14.3 but ranged from 11.4 to 28.4.

Table 3 presents the number of offerings and the average percent raised by U.S. regions, as well as, identifies the top three states within each region who have companies that are the most successful at raising funds.

Table 3. Title II Equity Offerings, Top 3 States by Region

Region	No. of Offerings	Avg. Percent Raised (%)
<i>Midwest</i>	<i>362</i>	<i>6.6</i>
Iowa		12.8
Wisconsin		9.6
Ohio		8.1
<i>Northeast</i>	<i>675</i>	<i>6.7</i>
Vermont		111.1
Maryland		13.9
New Hampshire		10.8
<i>South</i>	<i>848</i>	<i>7.1</i>
Puerto Rico		37.8
Alabama		20.2
Kentucky		18.7
<i>West</i>	<i>1,337</i>	<i>9.5</i>
New Mexico		21.4
Montana		10.6
Nevada		10.4
Total	3,222	8.0

Overall, more offerings occur among companies located in states in the West followed by those in the South. Together, offerings in these two regions comprise slightly more than two-thirds of all the offerings, and California is the state, by far, with the most offerings at 958 or 29.7 percent of all the offerings. The next two states with the most offerings are New York at 385 (11.9 percent of all the offerings) and Texas at 216 (6.7 percent of all the offerings). In terms of the percentage of funds raised, states in the West are also the most successful, raising 9.5 percent of the minimum target amount, on average, and the West is the only region to raise more than the overall average of 8.0 percent. Vermont is the most successful state where, on average, 111.1 percent of funds were raised, followed by Puerto Rico (37.8 percent) and New Mexico (21.4 percent).

Table 4 shows the number of offerings and the average percent raised by sector.

Table 4. Title II Equity Offerings, by Sector

Sector	No. of Offerings	Avg. Percent Raised (%)
Commerce & Industry	128	8.2
Consumer Goods	293	7.4
Energy	65	15.9
Financial	206	15.8
Healthcare	130	8.8
Materials	23	16.1
Services	1,293	6.6
Technology	1,084	7.4
Total	3,222	8.0

The majority or 73.8 percent of all equity offerings come from companies in the Services and Technology sectors, yet these two sectors are some of the least successful in terms of raising funds, as on average, they only raise 6.6 percent and 7.4 percent of the minimum target amount, respectively. Conversely, at the lower end of the offering spectrum, the Materials and Energy sectors comprises 2.7 percent of all equity offers; however, these two sectors are the most successful sectors raising above average amounts of 16.1 percent and 15.9 percent of the minimum target amount, respectively.

When we drill down into the industries within the sectors, we find that the top 10 of 268 industries comprise 24 percent of all the equity offerings (Table 5, Panel A), and all ten of these industries are in the Services or Technology sectors.

Table 5. Title II Equity Offerings, by Industry

Industry	Sector	No. of Offerings	Avg. Percent Raised (%)
<i>Panel A: Top 10 Industries by Number of Listings</i>			
Social Media	Technology	223	3.8
App Software	Technology	113	6.8
Education K-12	Services	78	1.8
Digital Media/New Media	Services	73	3.5
Online & Mobile Gaming	Technology	54	2.9
Social Commerce	Services	54	10.1
Healthcare Information Services	Technology	47	8.9
Entertainment, Other	Services	44	11.4
Music Services	Services	44	6.8
SaaS	Technology	43	11.2
<i>Panel B: Top 10 Industries by Percent Raised</i>			
Organic Food & Beverage	Consumer Goods	3	80.6
Motion Detection & Movement Sensing Technology	Technology	4	63.8
Concert/Theater Ticketing	Services	4	54.4
Home Furnishings & Fixtures	Consumer Goods	5	41.1
Venture Capital	Financial	15	33.2
Education, Other	Services	6	32.1
Wineries & Distillers	Consumer Goods	10	31.5
Air Delivery & Freight Services	Commerce & Industry	2	30.0
Green Building Materials	Materials	6	29.8
Investments, Other	Financial	22	28.8
Total		3,222	8.0

The top 2 industries are Social Media and App Software, which are in the Technology sector. Together, they make up 10.4 percent of all offerings but are below average in terms of successfully raising funds at 3.8 percent and 6.8 percent raised, on average, respectively. Conversely, the most successful industries in

terms of raising funds encompass relatively few offerings (Table 5, Panel B). For example, the most successful industry is Organic Food & Beverage in the Consumer Goods sector. On average, companies in this industry raised 80.6 percent of the minimum target amount but there was only a total of three equity offerings made. Overall, within the top 10 most successful industries, only two – Investments, Other and Venture Capital both within the Financial sector – had companies making more than ten offerings. All the others only made 2-10 offerings. However, the average percent raised for these industries ranges from 29.8 to 80.6 percent, far above the 8.0 percent average.

Figure 1 shows the number of offerings (black line) and the average percent raised (gray bars) by quarter-year from the fourth quarter of 2013 to the third quarter of 2016.

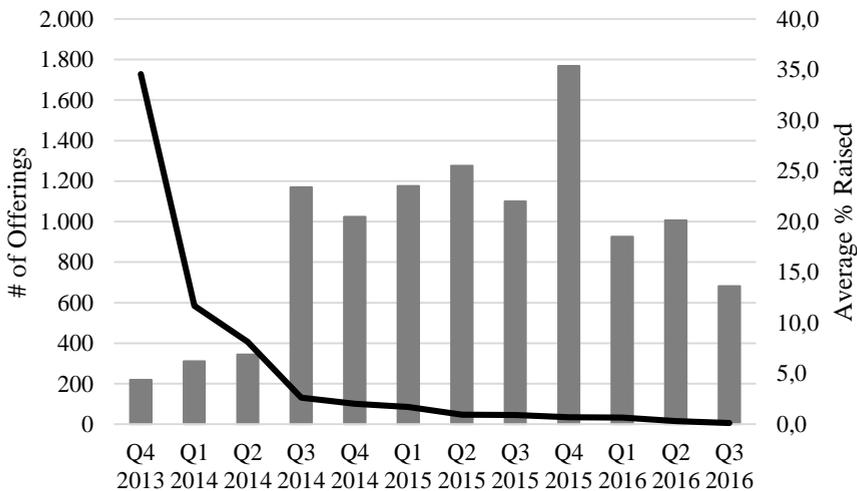


Figure 1. Title II Equity Offerings, by Quarter-Year

More than 80 percent of the offerings over this time period occurred in the first three quarters, and on average, the percent raised per quarter was very low – 4.4 percent in Q4 2013, 6.2 percent in Q1 2014, and 6.9 percent in Q2 2014. However, beginning in the third quarter of 2014, two items occurred – even fewer companies were attempting to raise funds via equity offerings, but the campaigns that were started became much more successful at raising funds. Compared to Q2 2014, in Q3 2014, the number of offerings dropped 67.6 percent (from 407 to 132), but the percent of the minimum target amount raised jumped to 23.4 percent (from 6.9 percent). The percent raised trended upward until Q4 2015 where it peaked at 35.4 percent and since then has trended downward to 13.6 percent in Q3 2016.

Conversely, the number of initiated campaigns was highest in Q4 2013 at 1,729 and steadily declined to 6 in Q3 2016. Overall, the trend in the number of offerings aligns with the effective dates of Title II and Title III of the JOBS Act. Title II allowed accredited investors to invest in projects, and companies – hopeful to find new funding – rushed to seize the opportunity during the period covered by the first few quarters of our dataset. With little campaign success initially, fewer companies attempted to raise funds via an equity offering under Title II and perhaps some entrepreneurs delayed their offering until investment opportunities expanded to non-accredited investors through Title III (effective date of May 16, 2016).

4.2. Regression Analysis

The descriptive analysis illustrates that the percent raised varies by region, sector, and quarter-year; therefore, our estimation controls for these various effects when examining factors that are related to successful equity-based crowdfunding. Table 6 presents the Tobit regression results and marginal effects for two specifications.

Table 6. Tobit Regression Estimates & Marginal Effects of Estimated Tobit Parameters

Variable	Specification 1		Specification 2	
	Tobit Regressi on Estimat es	Marginal Effect s	Tobit Regressi on Estimat es	Marginal Effect s
issueta	-0.0227 (0.0079)	*** -0.0042	-0.0229 (0.0081)	*** -0.0042
w_owned	-2.6546 (2.7191)	-0.4872		
w_mngt			-2.2082 (3.3185)	-0.4053
r_equicap	17.4460 (5.0925)	*** 3.2018	17.4718 (5.0909)	*** 3.2066
tagline	-71.4490 (5.0685)	*** -13.1128	-71.5513 (5.0925)	*** -13.1318
chgcpi	-12.0002 (11.3132)	-2.2023	-12.1064 (11.3788)	-2.2219
sp500	1.3795 (1.2441)	0.2532	1.3778 (1.2546)	0.2529
vixlevel	-1.6730 (0.5973)	*** -0.3070	-1.6841 (0.6256)	*** -0.3091
Region dummies	Yes		Yes	
Sector dummies	Yes		Yes	
Quarter-year dummies	Yes		Yes	
Number of observations	3,222		3,222	
No of left censored obs	2,479		2,479	

Log-likelihood	-4,811.05	-4,811.10
Pseudo R ²	0.0681	0.0681
Standard errors	robust	to sector-level clusters
appear in parentheses.		
*** denotes two-tailed significance level of 1%.		

Specification 1 examines if women-owned companies is related to percent raised whereas Specification 2 examines if women-managed companies is related to percent raised. Overall, the results for both specifications are similar, and for ease of presentation, Specification 1 results are discussed.

The statistically significant estimated coefficients on the company-specific variables indicate that the following are associated with a *higher* percentage of funds raised: (1) companies with lower minimum target amounts, (2) companies that report their equity capitalization and (3) companies that do *not* report a tagline. The minimum target amount result is consistent with our expectations and is consistent with previous findings in the literature (Block et al., 2018; Cordova et al., 2015; Lukkarinen et al., 2016). The result on reporting equity capitalization is also consistent with our expectation that more established companies are likely more attractive to investors. Of those companies that reported market capital, the average amount reported was \$7.2 million. The same cannot be said about our expectation for reporting a tagline. Because limited information is available to an investor when considering an equity crowdfunding investment decision, investors may look to description and tagline information to reduce information asymmetry. Our results are likely reflective of the quality of the text provided; the company taglines in our dataset vary considerably in the message disclosed. For example, there are companies that use vague taglines such as “Connecting Diagnostics.” However, there are others that do a better job at informing potential investors about a project such as “A better pet shampoo with a lasting scent that helps wash away the homeless pet epidemic.” The estimated marginal effect indicates that overall company taglines may not be well written and are putting companies at a disadvantage in terms of successfully raising funds. That is, given the other variables in our model, when a company tagline is reported, the percent raised is 13 percentages points lower, on average, compared to when a company tagline is not reported.

Finally, the estimated signs on the market-specific variables are consistent with our expectations, but only the VIX value is statistically significant. The results indicate that when the expected future volatility of the S&P 500 Index is low, a higher percentage of funds are raised via equity crowdfunding efforts. This supports equity investments relative to allocations in other asset classes.

5. CONCLUSIONS & FUTURE RESEARCH

This paper investigates the key determinants of online ECF campaign success. Our results are based on a comprehensive dataset comprised of 3,222 equity offers across 49 states and eight economic sectors. The study includes data on campaigns across 12 funding intermediaries. Our research is based on a unique dataset in a field with limited data availability. While Mamonov et al. (2017) provide a descriptive analysis of US equity Title II offers together with a detailed study of real estate campaigns and Mamonov and Malega (2019) examine success factors of Title II fundraising on one platform (Crowdfunder, n=337), our study reports a first in-depth analysis of Title II ECF in the US by examining more than 3,200 Title II offerings across 12 platforms.

Our findings regarding campaign success and significant factors such as minimum ask targets and reported equity capitalization, together with the negative effect of taglines, extend previous literature in this promising field of study. The sign and significance of the market sentiment VIX variable is also consistent with expectations, where equity investments are relatively attractive when low expected volatility conditions exist. This market variable significance provides offer timing implications for entrepreneurs seeking funding under ECF. In addition, the descriptive statistics herein lend depth to the understanding of equity crowdfunding in the U.S.

The results are based on the first three years of Title II ECF. To the extent that knowledge and familiarity with the crowdfunding process increases over time, future ECF offers may depend on new, additional factors. The findings described in this paper may or may not extend to Title III campaigns where non-accredited investors are allowed to participate. In addition, our study is constrained by the dataset characteristics and fields.

This study documents an unexpected negative result regarding offering taglines. We theorize that our tagline result is due to either the brevity of the tagline or the quality of the text provided. Limited research has examined the impact of investor sentiment toward equity crowdfunding offerings; therefore, more research is needed on the influence of the readability, tone, and overall sentiment of the equity crowdfunding written description and/or tagline on investors' investment behavior.

Language complexity, quality and positivity may be important components to the design of effective campaigns. Entrepreneurs, investors, and intermediaries each have an interest in reducing the informational asymmetry inherent in online ECF. Organized secondary markets are not yet available; therefore, all parties are bound by the long term nature of ECF.

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FACTORS INFLUENCING OVERALL SERVICE QUALITY OF ONLINE BANKING: A COMPARATIVE STUDY OF INDIAN PUBLIC AND PRIVATE SECTOR BANKS

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Abstract *Customer relationship and retention is the key to success for banks. One of the way to achieve it, is through improvement in overall service quality of online banking. This paper have identified factors influencing overall service quality of online banking by survey of 1014 online banking users and have proposed a model. Next, model was validated through a comparative study of public and private sector banks in India. Paper concludes that all independent factors of proposed model do influence overall service quality of online banking of both types of banks but the individual factor influence differently with different bank types.*

Keywords: *online banking, overall service quality, factor analysis, multiple regression analysis, public and private banks.*

JEL Classification: *G21, C21, O33, L86*

1. INTRODUCTION

In year 1965, mechanized banking which enabled the balance check and updating at teller counters through centralized computers was introduced in Indian banking system. Gradually the computers were used for reconciliation of transactions in the bank branches in 1980s (K., 2010).

Online banking was introduced in India in late 1990s. (Srivastava). In online banking customers can process different banking transactions like opening a bank

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account, transfer of funds to different accounts, bill payments etc. without physically visiting the bank (Paul & Richmond, 2007). The online banking transactions can be carried out anywhere and at any time by connecting devices such as desktop, laptop, mobile, tab with the internet. As customers could able to carry out banking activities without going to bank and also at any given point of time, this service very beneficial to them (Tina, 2003).

Another revolution that boosted the usage of online banking services was introduction of mobile phones. In year 1995, mobile phones were introduced in Indian market. Gradually, with the decrease in mobile tariffs of internet plan and the launch of smartphones, internet users through mobile phones increased. (C.Mathapati & Vidyavati, 2018). Internet users in India are over 560 million and by 2021 it will increase to 600 million. Further, it was found that majority of the Indians accessed the internet through their smartphones (Statista Research Department, 2020). Because of these changes, the usage of online banking also visualised huge growth. An article published in the economic times reported that 51% of Indian bank customers used online banking channels (Economic Times, 2017).

The gradual upgradation of technology in banks have changed the way conventional banking used to operate. With time there are changes in terms of demographic and social trends. All these have led Indian banking industry to become customer centric. Indian banks have become more customer focused and service oriented (Giannakoudi, 1999) (Byers & Lederer, 2001).

2. THE COMPETITIVE LANDSCAPE IN INDIAN BANKING

Indian banking sector has been witnessing changes since past few years. Various technological and financial innovations like Automated Teller Machines, Credit and Debit Cards, online banking etc. have wholly transformed the façade of Indian banking. These changes along with challenges have also created opportunities for the banks (Kaur & Rajneesh, 2014).

Banking transactions have become easy and convenient and are better serving to the customers in modern banking era (K., 2010). Technological developments have assisted banks through improved tracking, different service delivery channels and quick query resolutions (S.Suriyamurthi, Mahalakshmi, & Arivazhagan, 2013). Currently, providing real time information to the customers has become inevitable for the banks to remain competitive (Bhasin, 2007). The focus of banks now is to increase/maintain the market the share by switching to customer centric business model. This could be achieved through customer relationship management (Flavián, Torres, & Guinalú, 2004) (Gan, Clemes,

Limsombunchai, & Weng, 2006). Both public and private sector banks in India have therefore started services based on innovative technology to better serve its customers. The evaluation of both these types of banks indicate that the strength of private sector banks are online services of bill payment and online shopping, customer communication and technical efficiency while that of public sector banks are accessibility and privacy of online banking and its demonstration at counter. And the weakness that needs to be improved are online services of transaction alerts, online trading and advertisement (Jani, 2012). Thus, there is a need for the banks to continuously increase customers' satisfaction and one of the way to achieve that is through the improvement in overall service quality of online banking. Further it has to be understand that whether the type of banks has any impact on customer's perception of overall service quality of online banking.

3. CUSTOMERS' PREFERENCES FOR SERVICE QUALITY

Customer satisfaction and customer retention especially for online banking were highly critical for success of any bank (Abdullah, Manaf, Yusuf, Ahsan, & Azam, 2014). Customer satisfaction survey would not have much impact on the technicality of the financial products of the banks as they do not have noticeable differences among different banks. Thus the customers were more affected in the functional quality of the financial products as compared to the technical quality (Ülengin, 1998).

To evaluate customer satisfaction of the service quality of online banking, (Saha & Zhao, 2005) identified nine dimensions such as privacy, personalization, efficiency, fulfilment, reliability, communication, responsiveness, technology update and logistic/technical equipment. A study on the customer satisfaction in Bangladesh was done considering empathy, reliability, assurance, tangibles and responsiveness as factors of service quality of internet banking (Nupur, 2010). Few researchers also did comparative analysis of types of bank with respect to customer satisfaction of online banking for example, (Vanniarajan & Anbazhagan, 2007) did this comparison by applying SERVEPERF scale.

The research on banking customer satisfaction have considered empathy, responsiveness, assurance, competence, reliability and tangibility as the factors for evaluation service quality. The customer's perception about the services and the actual services indicate the gap. But this is very subjective. Customer satisfaction increases with the higher level of perception over expected service quality and vice versa that is, customer satisfaction decreases with the lower level of perception over expected service quality (Jain & Gupta, 2004).

Most customer satisfaction studies conducted so far have emphasised on either offline services or one or two services of digital banking or are conceptual which lack validation. Again, customer satisfaction not necessarily leads to loyalty and similarly customer dissatisfaction does not always lead to customer switching. Therefore it is required to understand the multidimensional constructs of service quality and its implications (Matos, Henrique, & Rosa, 2013).

4. BANKING SERVICES EVALUATION MODELS

(Davis, 1989) The Technology Acceptance Model (TAM) was developed in 1989 and considered attitude and usefulness for adoption decision and ease of use. Later, (Gounaris & Koritos, 2008) found that the TAM does not consider the individual psychological and social view about acceptance of technology. Further the model also do not consider the demographic factor which impact on the use of technology. (Lian & Lin, 2008) Perceived cost, perceived reliability and self-efficacy were considered to overcome the limitation of TAM.

(Venkatesh, Morris, Davis, & Davis, 2003) The Unified Theory of acceptance and use of technology (UTAUT) model combined the models of TPB and TAM and considered social cognitive models and motivational models. Next, (Venkatesh, Thong, & Xu, 2012) the UTAUT2 model was proposed by extending UTAUT model and considering three new constructs namely hedonic motivation, price value and habit and by doing this the variance explained was substantially increased as compared to original model. Further UTAUT2 model was extended by adding constructs for trust, security and privacy through a cross cultural study (Mohamed Merhia, 2019) (Ali Abdallah Alalwan, 2017).

A conceptual model was suggested through case studies of Iran top e-banks considering the effects of using CRM system in the adoption of m-banking on customer satisfaction and interaction (Hamidi & Safareeyeh, 2019). Customer satisfaction could not be the only parameter to measure the quality of online banking and therefore a study conducted in China evaluated the effects of experience considering six antecedents to customer satisfaction namely ease of use, design, speed, security, information content and customer support service (Yoon & Cheolho, 2010).

One of the study focused on discontinuous usage of mobile banking through adoption of Trait Hierarchical Model (THM) and Optimum Stimulation Level Theory (OSLT) (Philip Avornyoa, 2019). A study was conducted in Ghana to ascertain the determinants of internet banking adoption intentions using the social cognitive theory (Boateng, Adam, Okoe, & Anning-Dorson, 2016). Saudi Arabia's

m-banking users were studied and proposed a conceptual model combining two models namely UTAUT2 and the D&M IS Success Model (Baabdullaha, Alalwanb, Ranac, Kizgin, & Patil, 2019). A revised and extended model was proposed based on UTAUT and TAM to understand the determinants affecting behavioural intentions to adopt mobile banking among generation Y (Waranpong Boonsiritomachai, 2017).

5. OBJECTIVES OF THE STUDY

As can be seen from the studies conducted so far, the models have been suggested for different aspect of banking like retail banking, digital banking and mobile banking and that too by considering only few features/services. Moreover, most studies have considered dependent variable such as customer satisfaction, retention or experience for the success of banking. This creates an opportunity to evaluate other aspects that are necessary for the banks to achieve success like customers' overall experience of service quality especially of online banking. Again, the geographic location considered for these studies do not include India. Next, the constructs used by model were proposed considering the macro and micro economic factors of the selected geographical location and many of the studies were conceptual and so they had not validated the model. Considering all these, this paper proposes and validates the model that measures the overall service quality of online banking of Indian Banks. Based on the above literature review, the following research objectives were framed:

- To measure the impact of various factors on overall service quality of online banking.
- To compare the overall service quality of public and private sector banks of India

6. RESEARCH METHODOLOGY

6.1. Research design: To understand the impact of various factors of digital banking services on the overall service quality and derive unique solutions, data was collected in different geographical regions, demographic profiles and was analyzed through different tools and techniques. Therefore descriptive cross-sectional research design was chosen to perform this study.

6.2. Data collection: Data collection was done using primary as well as secondary data sources. Secondary data sources such as journal articles and websites were referred. Primary data collection was done through self-administered structured questionnaire.

6.3. Questionnaire design: Questionnaire consisted of twenty-four questions in which first ten questions were related to demographic information and the next six questions were related to banks and online banking information. The last eight questions included a total of forty-four statements with seven point Linkert scale. Among the eight questions, seven were related to independent factors that influence online banking service quality namely assistance (seven statements), competence (six statements), ease of use (seven statements), connectivity (five statements), tangibility (four statements), security (three statements) and accessibility (three statements) and the last was dependent factor related to overall service quality (nine statements).

6.4. Sampling design: For the survey of respondents, certain criteria were identified to ensure the quality of responses. These criteria were related to respondent's minimum age (20 years), minimum time (at least six months) of usage of online banking services of either public (State Bank of India, Bank of Baroda, Punjab National Bank and Bank of India) or private (Housing Development Finance Corporation Bank, Industrial Credit and Investment Corporation of India Bank, Axis Bank and Kotak Mahindra Bank) sector banks. Therefore, to achieve this specific criteria, non-probability sampling design was applied to conduct the extensive research on e-banking services.

The respondents were selected from Gujarat state of India as this state represents the population from entire India. Further, in Gujarat state, four major districts were identified namely Ahmedabad, Baroda, Rajkot and Surat and data was collected from these four districts.

Data was collected from the survey of 1050 respondents and out of that 24 questionnaire were incomplete and so the final sample size came to 1026 respondents. Out of these, 12 outliers were identified by Mahalanobis distance and were removed. Among the final sample size of 1014 respondents, 590 and 424 respondents were digital banking users of private and public sector banks respectively.

6.5. Analytical tools and techniques: SPSS 25 software was used to perform the statistical analysis to identify factors and measure the impact. The exploratory factor analysis was performed to understand the influencing factors with respect to online banking service quality. The multiple regression method was performed to measure the impact of independent variables on overall service quality of public and private sector banks. While performing the analysis, the important factors for examining the data like reliability, convergent validity, and adequacy of sample size were considered. It was also examined that the assumption of the important

parameters like autocorrelations, multicollinearity, normality and homoscedasticity were not violated.

7. HYPOTHESES FOR MODEL DEVELOPMENT

- H1. There is significant difference in perceived assistance with respect to overall service quality of digital banking services
- H2. There is significant difference in perceived competence and with respect to overall service quality of digital banking services
- H3. There is no significant difference in perceived ease of use with respect to overall service quality of digital banking services
- H4. There is significant difference in perceived connectivity with respect to overall service quality of digital banking services
- H5. There is significant difference between in perceived tangibility with respect to overall service quality of digital banking services
- H6. There is significant difference in perceived security with respect to overall service quality of digital banking services
- H7. There is significant difference in perceived accessibility with respect to overall service quality of digital banking services

8. EMPIRICAL ANALYSIS AND FINDINGS

The most important aspect of quantitative analysis is to understand which factors are influencing to digital banking service quality, therefore factor analysis was performed. To identify the independent factors, KMO and Bartlett’s test was performed. This test of sphericity, as shown in the below table, indicate the value of 0.920 which suggest that there are more than two independent factors that are influencing to digital banking services. The KMO and Bartlett value of 0.920 is greater than 0.70 which indicated that adequate samples were selected in the data collection.

Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.920
Bartlett's Test of Sphericity	Approx. Chi-Square	20671.228
	Df	595
	Sig.	.000

Further, communalities extraction of all the thirty-five statements were found to be more than 0.30 and were acceptable in comparison with the benchmark values. The highest communalities extraction was 0.818 while the lowest communalities extraction was 0.478.

Table 2: Exploratory Factor Analysis

Factors	Item	Factor Loading	Eigen values	% of variance explained	Reliability Cronbach Alpha
Assistance	Easy change of security questions	.809	12.237	34.964	.841
	Quick issue of debit/credit card in case of damage/lost	.806			
	Proper support in-case of transaction error	.790			
	On-line re-generation/change of password	.744			
	Convey of OTP through phone call in-case of non-receipt through SMS	.657			
	Reasonability of charges on digital services offered	.579			
	Updating on real time basis	.520			
Competence	Continuity of account login while transaction execution	.851	3.310	8.942	.851
	Error-free processing of transactions	.776			
	Accuracy of account information	.739			
	Immediate receipt of OTP	.665			
	Quick processing of transactions	.600			
	Quick login into account	.433			
Ease of use	Availability of voice instructions for visually impaired	.868	1.876	5.361	.864
	Account/ transaction information are intelligible	.821			
	System populates automatic information	.790			
	Images/icons related to type of transactions	.772			
	Minimum steps for transaction execution	.647			
	Clear instructions to execute transactions	.569			
	Continuation of server connectivity during transaction	.496			
Connectivity	Continuous availability of internet	.846	1.484	4.241	.829
	Connectivity is constant during transaction	.801			
	Continuous working of site/application while transaction processing	.751			
	Account accessibility with low internet connectivity	.481			

Factors	Item	Factor Loading	Eigen values	% of variance explained	Reliability Cronbach Alpha
	Availability of server response during transactions	.429			
Tangibility	Exhaustive information	.864	1.275	3.641	.821
	Relevant information	.862			
	Understandable information	.831			
	Availability of all banking services on digital platform	.607			
Security	Sufficient measures taken to make transactions/data secure/safe	.896	1.178	3.365	.731
	Automatically logging off in case of connectivity loss or during idleness of account	.809			
	Multilevel authorization to access account	.717			
Accessibility	Availability of digital banking payment option at merchant/ service provider	.996	1.119	3.197	.793
	Availability of digital banking channels whenever required	.775			
	Compatible for all devices	.508			

As indicated in the above table, there are seven independent factors that are influencing to digital banking service quality, derived from pattern matrix. First factor with seven statements was related to perceived assistance (PAS) lies between 0.809 and 0.520 which is significantly high scores. The Eigen value of PAS is 12.237 which is very high and this particular factor explains 34.964% of variance with respect to overall service quality. The reliability test of the factor, PAS shows the value of Cronbach alpha of 0.841 which shows that all seven statements significantly contribute to this factor.

Second factor amongst the seven is perceived competence (PCT) included six statements. Factor loading of these statements lies between 0.851 and 0.433 which indicate significantly accepted scores except the last statement. The Eigen value of PCT is 3.310 and individually 8.942% variance explained to overall digital banking' service quality. The Cronbach alpha of PCT is 0.851 and all the six statements significantly contribute to the PCT with respect of overall digital banking service quality.

Third influencing factor is perceived ease of using content (PEOU) with seven statements. The factor loading are from 0.868 to 0.496 which are acceptable score for this factor except for last statement. The Eigen value is 1.876 and this explain 5.361% of variation and cumulative 49.26% of variance is explained by the

first three factors. The Cronbach alpha of PEOU is 0.864 which is significantly higher than the benchmark value.

Fourth influencing factor is perceived connectivity (PCN) with five independent statements. The factor loading of these statements are from 0.846 to 0.429. Except the last statement, factor loading are significantly high and acceptable. The Eigen value of the PCN is 1.48 and explains 4.24% of variance. The Cronbach alpha is 0.829, higher than 0.70 which is desirable benchmark value.

Fifth factor identified through the tool principal component analysis is perceived tangibility (PTA) includes four independent statements having factor loading between 0.864 and 0.607 which is significantly high. The Eigen value is 1.28, higher than 1. PTA contributes to 3.64% to explain variance and Cronbach alpha of four significantly contributed statements is 0.821 which is desirable.

The sixth factor identified is perceived security (PSC). It included three independent statements and the factor loading are 0.896, 0.809 and 0.717 indicate significantly very high acceptable values. The Eigen value of PSC is 1.18 and 3.37 percentage of variance is explained by this factor. The Cronbach alpha of PSC is 0.731, which is higher than the benchmark value of reliability.

The last and the important independent factor of digital banking service quality is perceived accessibility (PAC) including three statements. The factor loadings of component 0.966, 0.75 and 0.508 are fairly large and acceptable. The Eigen value of the factor is 1.12 which is more than 1. PAC explains 3.20 percentage of variance and Cronbach alpha is 0.793, fairly acceptable.

In all, seven factors were identified which influenced the overall service quality of digital banking service. These factors are perceived assurance (PAS), competence (PCT), ease of using (PEOU), connectivity (PCN), tangibility (PTA), security (PSC) and accessibility (PAC). The Eigen value of all these seven factors are more than 1 and Cronbach alpha are more than 0.70 which is more than desirable. All seven variables together explains 63.71 percentage of variance. Overall average variance explained by these factors, except PCN is more than 0.50. This indicates that the assumption of convergent validity has not been violated. In the fourth factor which is PCN, the last statement with factor loading 0.429 has been removed and after that the last statement explains 0.523 average variance which is more than 0.50. It suggests that the assumption of convergent validity has not been violated.

9. ONLINE BANKING OVERALL SERVICE QUALITY PROPOSED MODEL

Based on the results of exploratory factor analysis, the model was constructed considering the measurement of online banking overall service quality. The model assumes that the perceived overall service quality (OSQ) of online banking services was dependent on online banking users' perceived assistance (PAS), perceived competence (PCT), perceived ease of use (PEOU), perceived connectivity (PCN), perceived tangibility (PTA), perceived security (PSC) and perceived accessibility (PAC). Based on this assumption, dependent variable OSQ was influenced by seven independent factors as shown in the figure below:

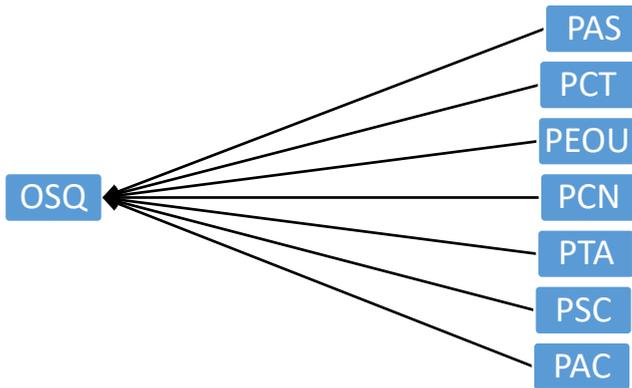


Figure 1: Online banking overall service quality measurement model

The next section includes hypotheses for mode validation followed by findings of multiple regression analysis.

10. MODEL VALIDATION: HYPOTHESES

- H8. The independent factors of digital banking service significantly create impact of overall service quality of public and private sector banks.
- H9. Perceived assistance create significant impact on overall service quality of digital banking of public and private sector banks.
- H10. Perceived competence create significant impact on overall service quality of digital banking of public and private sector banks.
- H11. Perceived ease of use create significant impact on overall service quality of digital banking of public and private sector banks.
- H12. Perceived connectivity create significant impact on overall service quality of digital banking of public and private sector banks.
- H13. Perceived security create significant impact on overall service quality of digital banking of public and private sector banks.

- H14. Perceived accessibility create significant impact on overall service quality of digital banking of public and private sector banks.
- H15. Perceived tangibility create significant impact on overall service quality of digital banking of public and private sector banks.

11. MODEL VALIDATION: ANALYSIS AND FINDINGS

Table 3: Comparative descriptive statistics and Independent sample T-test

Factors	Private sector banks			Public sector banks			T-stat.	Sig.	Alternate Hypothesis Decision
	N	Mean	Std. Dev.	N	Mean	Std. Dev.			
PAS	590	4.10	1.16	424	3.65	0.93	-5.53	0.00	Accepted
PCT	590	5.67	0.80	424	5.15	0.89	-4.20	0.00	Accepted
PEOU	590	4.73	0.92	424	4.19	0.86	-5.68	0.00	Accepted
PCN	590	4.28	1.13	424	3.99	1.04	-4.06	0.00	Accepted
PSC	590	4.64	1.10	424	4.34	1.11	-4.25	0.00	Accepted
PTA	590	4.84	0.98	424	4.58	0.95	-4.26	0.00	Accepted
PAC	590	4.88	0.80	424	4.69	0.74	-3.94	0.00	Accepted
POSQ	590	4.52	0.86	424	4.24	0.75	-5.38	0.00	Accepted

Based on the exploratory factor analysis and with the support of the literature review, a measurement model for evaluating digital banking service quality was developed. Seven independent factors namely perceived assistance, perceived competence, perceived ease of using, perceived connectivity, perceived tangibility, perceived security and perceived accessibility were identified that influenced perceived overall service quality. Next, comparison of public and private sector banks was done using above parameters. Along with descriptive analysis, independent T-test and multiple regression was performed to analyze and compare the digital banking service quality of public and private sector banks.

As seen from the above table, the mean of private sector banks is significantly higher than public sector banks. All the t values are showing negative sign and significance 0.00 which is less than 0.05. This indicate that private sector banks provide significantly efficient services than public service banks. Both public and private sector banks have very competence digital banking service quality model and indicate very high perceived value of mean. Even perceived competence, perceived tangibility and accessibility is also having very high value of average with respect to average values and the standard deviations in the responses. Perceived assurance and perceived overall service quality are the most

important aspects and shows significant difference between public and private sector banks. Private sector banks mean scales significantly higher than public sector banks mean scores. Majority of respondents are more concern regarding security and assurance aspects of digital banking service quality. Their responses are highly fluctuating. Overall all the parameters of digital banking service quality, private banks provide better services than public sector banks in India.

The impact of all the independent factors on overall service quality was measured through multiple regression enter method to validate the model for digital banking service quality model for public and private sector banks in India.

Table 4: Model Summary

Banks	R	R ²	Adjusted R ²	S.E. of estimate	F change	Sig.	Durbin Wats on
Private	0.928	0.861	0.859	0.2715	430.88	0.00	1.467
Public	0.817	0.667	0.651	0.3403	510.73	0.00	1.545

Both types of banks shows the strong relationship between all Independent factors and overall service quality. Private sector banks R value which is 0.928 is significantly higher than the public sector banks. Coefficient of determination indicate that in private sector banks, 86.10 percentage of changes related to overall service quality because of all independent factors. In public sector banks, these seven factors found responsible for 66.70 percentage of changes in overall service quality. The significant value for private and public sector respectively indicate sig 0.00, F 430.88 and sig. 0.00, F 510.73. Thus all the seven independent factors together create impact on overall service quality of public and private sector banks.

Table 5: Model of private sector banks

Factor	Un Std. Beta	Std. Beta	t	Sig.	tolerance	VIF	Alternate Hypothesis Decision
Constant	0.211	-	2.189	0.029	-	-	-
PAS	0.332	0.418	18.48	0.00	0.653	1.533	Accepted
PCT	0.154	0.186	7.170	0.00	0.495	2.019	Accepted
PEOU	0.100	0.114	4.264	0.00	0.467	2.139	Accepted
PCN	0.216	0.290	12.196	0.00	0.589	1.698	Accepted
PSC	0.112	0.202	9.246	0.00	0.700	1.429	Accepted
PAC	0.092	0.086	1.506	0.01	0.590	1.695	Accepted
PTA	0.132	0.125	2.132	0.00	0.325	3.078	Accepted

Table 6: Model of public sector banks

Factor	Un Std. Beta	Std. Beta	t	Sig.	tolerance	VIF	Alternate Hypothesis Decision
Constant	0.295	-	2.634	0.009	-	-	-
PAS	0.359	0.488	20.597	0.000	0.488	2.049	Accepted
PCT	0.081	0.072	2.886	0.004	0.435	2.300	Accepted
PEOU	0.065	0.065	2.296	0.022	0.342	2.922	Accepted
PCN	0.206	0.248	10.301	0.000	0.475	2.107	Accepted
PSC	0.119	0.168	7.834	0.000	0.595	1.680	Accepted
PAC	0.105	0.101	4.663	0.000	0.588	1.700	Accepted
PTA	0.092	0.105	3.815	0.001	0.338	2.958	Accepted

If we compare two models as in above tables, the significance value for all the independent factors related to digital banking services in public and private sector banks are less than 0.05 which indicate that all the variables are significantly contribute to overall service quality. The most influential factor in public and private sector banks is of perceived assurance and second is perceived connectivity. In the private sector banks, perceived competence is third influential factor while in public sector banks it is perceived security. Perceived ease of use, perceived accessibility and perceived tangibility significantly contribute to overall service quality but least contribute to dependent variables. Digital banking service quality model for public and private sector banks, in general, would be as under:

$$Y = a + \beta_01 (X_1) + \beta_02 (X_2) + \beta_03 (X_3) + \beta_04 (X_4) + \beta_05 (X_5) + \beta_06 (X_6) + \beta_07 (X_7) + e$$

Based on the results of the study, the above model for private sector banks is a under:

$$OSQ = 0.211 + 0.332(PAS) + 0.154(PCT) + 0.100(PEOU) + 0.216(PCN) + 0.112(PSC) + 0.092(PAC) + 0.132(PTA) + e$$

As can be seen from above equation, 10 units of perceived assurance create 3.32 units impact on overall service quality of digital banking. Likewise, 10 units of perceived competence, perceived ease of use, perceived connectivity, perceived security, perceived accessibility and perceived tangibility creates 1.54, 1.00, 2.16, 1.12, 0.92, 1.32 units impact respectively on overall service quality of digital banking.

Similarly, the model for public sector banks based on the data analysis, is as under:

$$OSQ = 0.295 + 0.359(PAS) + 0.081(PCT) + 0.065(PEOU) + 0.206(PCN) + 0.119(PSC) + 0.105(PAC) + 0.092(PTA) + e$$

As the above equation indicates, 10 units of perceived assurance, perceived competence, perceived ease of use, perceived connectivity, perceived security, perceived accessibility and perceived tangibility creates 3.59, 0.81, 0.65, 2.06, 1.19, 1.95 and 0.92 units impact respectively on overall service quality of digital banking.

Considering the high values of the correlation coefficient with respect to all the independent and dependent variables in both public and private sector banks model, the test of multicollinearity was applied. As can be seen in table no. 5 and 6, the value of tolerance was more than 0.20 and the value of variance influence factors (VIF) was less than 5 for all the independent variables. This indicate that the assumption of multicollinearity was not violated. Further, various chart related to linearity, normality and homoscedasticity included in Appendix indicate that they were not violated and validate the model of digital banking service quality with respect to public and private sector banks.

12. CONCLUSION

Both the research objectives were achieved through this study. The exploratory factor analysis showed the impact of individual factors on overall service quality of online banking. Based on this findings, a model was developed that mentioned the independent factors that influence the overall service quality of online banking namely assistance, competence, ease of use, connectivity, tangibility, security, and accessibility. To further validate the model and to compare the public and private sector banks, multiple regression analysis was applied. Through the findings, the model was validated and the comparison showed that the impact of individual factor will vary in different types of bank.

13. LIMITATIONS OF THE STUDY AND FUTURE RESEARCH

The study considered respondents who were using online banking for a year and more as these customers could able to justify the responses as they have experience of using online banking. The perception of new users could be different and so the future study could be done on identifying service quality factors of new customers.

The study has validated the model considering public and private sector banks as they have the larger market share. Future study could be conducted considering other types of banks such as foreign banks, co-operative banks and regional rural banks.

The research findings and conclusion was carried out considering Indian banks and Indian populations. Future study could be done considering other countries banks and populations.

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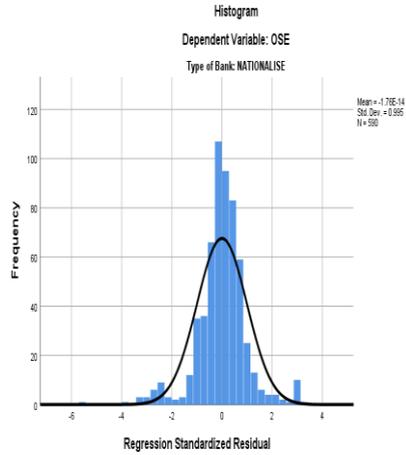
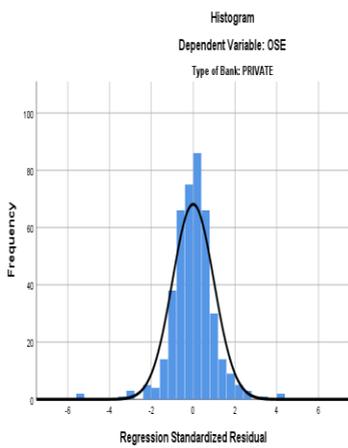
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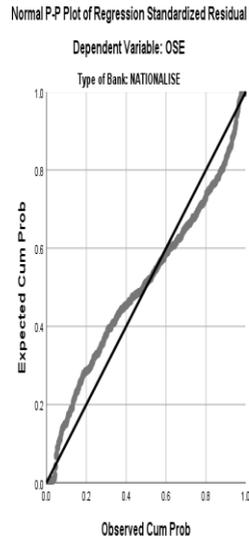
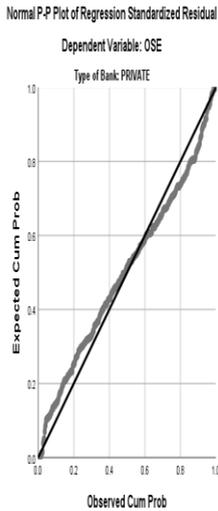
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Appendix

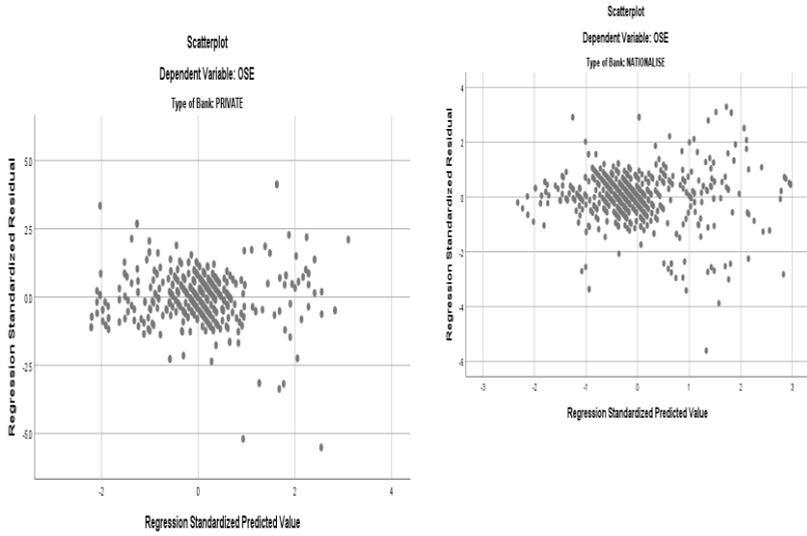
Appendix I: Histogram chart of public and private sector banks



Appendix II: Normal P-P plot of regression standardized value chart of public and private sector banks



Appendix III: Scatterplot chart of public and private sector banks





FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN THE PRESENCE OF SIMULTANEITY BIAS: PANEL DATA EVIDENCE

OBINNA FRANKLIN EZEIBEKWE*

Abstract: *Does financial development positively contribute to economic growth? One line of research argues that financial development is a positive contributor to growth. However, other studies show that financial development is not necessary for economic growth. An important contribution of this paper is that it estimates the correlation between financial development and economic growth after accounting for simultaneity bias. I employ the Principal Component Analysis to construct a composite financial development indicator based on four financial development variables. Due to the demand-following hypothesis which states that economic growth causes financial development, I conduct an endogeneity test on the composite financial development indicator and the results suggest that financial development is endogenous. Using the random effects instrumental variable estimation and the past values of the composite financial development indicator to account for simultaneity bias, I find that financial development remains a positive and relevant contributor to the long-run economic growth of developed countries.*

Keywords: *Financial development, Economic growth, Panel data econometrics, Principal component analysis, Instrumental variable, Simultaneity bias, Developed countries*

JEL Classification: *O16, E44*

1. INTRODUCTION

Does financial development contribute significantly to economic growth in developed countries? To answer this question, this paper reviews the debate on the impact of financial development on economic growth and presents new empirical evidence on the relationship between financial development and economic growth for 10 developed countries after controlling for simultaneity bias using instrumental variable estimation and the past values of the financial development variable.

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Empirical results suggest that there are disagreements on how financial development affects economic growth and development. Some studies argue that financial development is integral for economic growth because of its fund mobilization and allocation functions. Authors such as Patrick (1966), Hicks (1969), and McKinnon (1973) propose that financial development drives economic growth through financial intermediation. In addition, a United Nations' *World Economic Situation and Prospects 2018* report identified a strong financial architecture as crucial to actualizing balanced and sustainable growth because it ensures a steady provision of finance for industrialization.

However, other studies argue that financial development does not contribute significantly to economic growth. According to Lucas (1988), economists exaggerate the development impact of financial institutions. Similarly, Rousseau and Wachtel (2011) show that financial development is no longer a strong contributor to growth when a more current dataset is used as opposed to using data that covers the period from 1960 to 1989. Lastly, financial development negatively affects economic growth when bank credit to the private sector gets to 100% of GDP (Arcand *et al.* 2015).

Another argument that dominates the finance-growth literature is that of causation. Authors such as McKinnon (1973), and King and Levine (1993) are in support of the supply-leading hypothesis which stipulates that financial development drives economic growth. However, advocates of demand-following hypothesis posit that economic growth facilitates financial development by stimulating the financial sector to fund investments and growth. This notion has been supported by researchers such as Robinson (1952) and Hong, Torous, and Valkanov (2007).

More research needs to be conducted on the topic of financial development and economic growth (Levine, 1997) and given the potential of financial development to spur growth, it becomes imperative to estimate the correlation between financial development and economic growth in developed countries from 1980 to 2016. In this paper and in line with the literature, I construct a growth model with a composite financial development indicator, the key independent variable. The composite financial development indicator was constructed using four financial development indicators popular in the finance literature and they are broad money (liquid liabilities) as a percent of GDP (M3/GDP), domestic credit to the private sector by banks as a percent of GDP, stock market capitalization as a percent of GDP, and stock market turnover ratio (value traded divided by market capitalization).

Some empirical works used one or two financial deepening indicators to proxy financial development. Here, I employ four financial development indicators to construct a composite financial development indicator because a single indicator is not capable of explaining financial development which contributes to economic growth through different mediums. Another key feature of this study that separates it from earlier studies is that it tests whether financial development is endogenous in the model (simultaneity bias). Also, I control for major determinants of growth such as gross fixed capital formation, labor force, government revenue (excluding grants) as a percent of GDP, trade openness, net inflows of foreign direct investment as a percent of GDP, and inflation rate. Therefore, I evaluate whether there is a significant positive correlation between financial development and economic growth of developed countries that is independent of other major variables associated with economic growth. Lastly, I use panel data for 10 developed countries that extend the period of analysis to 2016 to find out if the results of earlier studies are consistent with the present situation.

This paper will empirically answer the following question emanating from the arguments presented above. Does financial development contribute significantly to economic growth in developed countries in the presence of simultaneity bias? I employ different econometric methods to address the question posed by this study. First, I construct a composite financial development indicator using the principal component analysis. Then, I conduct a unit root test on the panel dataset to determine whether they are stationary or nonstationary. Having established that the variables are stationary at levels, I conduct endogeneity tests on the composite financial development indicator using the random and fixed effects methods presented by Wooldridge (2010). Both results suggest that the composite financial development indicator is endogenous. Therefore, I use the random effects instrumental variable estimation, selected by the Hausman test, and the past values of the financial development variable to determine the impact of financial development on the economic growth of developed countries. I find that, after controlling for major determinants of growth and accounting for simultaneity bias, financial development has a positive impact on the economic growth of developed countries, and the size of the impact is both statistically and economically significant.

The remainder of the paper is organized as follows. Section 2 presents the literature review and section 3 presents the data, model specification, and econometric methods. Results and discussion are reported in section 4. A final section gives the conclusion and recommendations.

2. LITERATURE REVIEW

Since the groundbreaking works of Goldsmith (1969), McKinnon (1973), and Shaw (1973), the relationship between financial development and economic growth has remained a controversial topic and numerous empirical studies have been carried out to investigate the relationship (De Gregorio and Guidotti, 1995). This section presents the results of some of those studies on developed countries.

In a broad cross-section of 80 countries using data averaged over 1960-1989, King and Levine (1993) show that the financial system can promote economic growth for all economies. Specifically, financial development indicators are positively associated with economic efficiency improvement, physical capital accumulation, and RGDP per capita growth. Similarly, Beck and Levine (2004) investigate the impact of stock markets and banks on the economic growth of 40 countries using a panel data set for the period 1976 to 1998 using the generalized method of moments techniques developed for dynamic panels. They find that stock markets and banks positively influence economic growth and the results are not caused by endogeneity-induced bias.

Furthermore, Apergis *et al.* (2007) collected a panel dataset for 15 Organization for Economic Co-operation and Development (OECD) countries and 50 non-OECD countries over the period 1975 to 2000 to estimate the long-run relationship between financial development and economic growth. The result suggests that there are equilibrium and bidirectional relationship between financial development and economic growth. In addition, Rioja and Valev (2007) investigate the effects of financial development on the determinants of economic growth in developed and developing countries. Their hypothesis is that financial development may affect productivity and capital investment in different ways in developed and developing countries using panel data from 74 countries. Empirical results show that, in more developed countries, financial development is positively associated with productivity and growth; while the effect of financial development on economic growth occurs mainly through capital investment in less developed economies.

In summary, while most of the evidence points to the fact that financial development is a positive and significant contributor to growth; the magnitude of the effect of financial development on growth varies with different indicators used to proxy financial development or to construct a composite financial development indicator, sample size, data frequency, the mathematical form of the model, and the type of estimator used (Khan and Senhadji, 2000).

3. DATA, MODEL SPECIFICATION, AND ECONOMETRIC METHODS

3.1. Data

This study employs annual panel data for 10 developed countries (based on United Nations classification) over the period 1980 to 2016, a period of 37 years. The 10 countries are Australia, Austria, France, Germany, Japan, Netherlands, Norway, Spain, Switzerland, and the United States of America. The data was collected from *World Development Indicators* compiled by the World Bank, *Federal Reserve Economic Data* (FRED) sourced from the Federal Reserve Bank of St. Louis website, Global Financial Data and IMF's International Financial Statistics.

To construct the composite financial development indicator, I collected data for the following financial development indicators: broad money (or liquid liabilities) as a percent of GDP, domestic credit to the private sector by banks as a percent of GDP, stock market capitalization as a percent of GDP, and stock market turnover ratio (computed as value traded divided by market capitalization). Broad money as a percent of GDP, measures the breadth of financial markets, domestic credit to the private sector by banks as a percent of GDP measures the financial strength (lending capabilities) of banking institutions in an economy, and stock market capitalization as a percent of GDP measures the extent of capital market development. The stock market turnover ratio measures the efficiency and/or liquidity (the ease of buying and selling shares) of stock markets and high turnover implies a low transaction cost (Levine and Zervos, 1996). All financial indicators used positively affect economic growth. Also, I collected data for control variables such as gross fixed capital formation, working population (labor force), government revenue (excluding grants) as a percent of GDP, trade openness, net inflows of foreign direct investment as a percent of GDP, inflation rate and the instrumental variable, gross domestic savings.

I employ the principal component analysis (PCA) to construct the composite financial development indicator used in this study (see OECD 2008). I adopt a composite financial development indicator because a single financial development indicator cannot capture the overall impact financial development has on economic growth and development. Therefore, I employ an indicator based on four financial development indicators to estimate the relationship between financial development and economic growth of developed countries.

I conduct the Kaiser-Meyer-Olkin sampling adequacy test to determine if the four financial development indicators are suitable for principal component analysis (Kaiser, 1974; Cerny and Kaiser, 1977). Since the KMO statistic is greater than

0.5, I conclude that the financial development indicators are adequate for PCA. The result of the KMO sampling adequacy test is presented in Table 1.

Table 1: Kaiser-Meyer-Olkin Sampling Adequacy Test

VARIABLE	KMO
<i>BROAD</i>	0.6268
<i>CREDIT</i>	0.6123
<i>MKTCAP</i>	0.7893
<i>TURNOVER</i>	0.7939
OVERALL	0.6563

Source: Author's computation (2019)

3.2. Theoretical Framework and Model Specification

This work is based on Levine's 1997 study, *Financial Development and Economic Growth: Views and Agenda*, in two ways. First, I use some financial indicators identified in Levine (1997) to construct the composite financial development indicator used in this study. However, I included stock market capitalization of listed domestic companies as a percent of GDP to account for capital market development, and stock market turnover ratio to account for efficiency and/or liquidity of the capital market. Including these two variables improves the measurement of financial development. Second, I adopt the linear specification of the growth model which expresses economic growth indicators in terms of financial development indicators and control variables such as initial income (log), initial secondary school enrollment rate (log), inflation rate, government consumption expenditures to GDP ratio, and trade openness.

The empirically proven demand-following hypothesis which stipulates that economic growth facilitates financial development suggests that financial development may be endogenous. An implication of using an endogenous variable as an explanatory variable is that it creates the problem of endogeneity – correlation between an explanatory variable and the error term which leads to biased and inconsistent coefficients (Wooldridge, 2013). To test and account for the possible endogeneity of the financial development variable, *FINANCE*, and drawing from the regression equation above, I specify the panel data simultaneous equation model of this study as

$$(1) \quad RGDP_{it} = \beta_1 FINANCE_{it} + \lambda_1 X_{it} + U_{i1} + \varepsilon_{it1}$$

$$(2) \quad FINANCE_{it} = \beta_2 SAVINGS_{it} + \lambda_2 X_{it} + U_{i2} + \varepsilon_{it2}$$

Where (1) is the structural equation to be estimated and (2) is the reduced form equation that expresses the potentially endogenous *FINANCE* in terms of the exogenous explanatory variables in (2) and an instrumental variable, *SAVINGS*.

Where $i = 1, 2, N$; $t = 1, 2, T$; i refers to number of countries, t refers to time period; $RGDP_{it}$ (log) is the level of gross domestic product after accounting for price changes in country “ i ” over the period “ t ”; $FINANCE_{it}$ is the composite financial development indicator in country “ i ” over the period “ t ” and β_1 is the estimated coefficient on *FINANCE*; λ_1 is a vector of coefficients on the variables in X ; X_{it} is a vector of control variables on country “ i ” over the period “ t ”. The control variables are considered important and relevant to developed economies and they include real *gross fixed capital formation* (log) which measures the amount of investments in capital goods; *working population or labor force* (log) measures the amount of a country’s working-age population (people aged 15 to 64) and a proxy for labor force; *government revenue, excluding grants, as a percent of GDP* measures cash receipts from taxes, fines, fees, rent, and other revenues such as income from property or sales; *trade openness*, calculated as the sum of exports and imports as a percent of GDP, measures the relative importance of international trade in the economy of a country; *net inflows of foreign direct investment as a percent of GDP* measures the amount of capital inflow; and *inflation rate*. The instrumental variable, *SAVINGS* (log) measures the amount of household, business, and government savings. U_i is the unobserved heterogeneity, and ε_{it} is the idiosyncratic error in country “ i ” over the period “ t ”. I expect inflation to appear with a negative sign while the other regressors are expected to be positive.

According to a 2018 United Nations’ report, *World Economic Situation and Prospects*, investment, measured by gross fixed capital formation, accounted for roughly 60 percent of the acceleration in global economic activity in 2017; protectionist tendencies have the potential of limiting world trade hence the importance of trade openness; and foreign direct investment remains the most stable form of capital flow in the world. I follow Levine and Zervos (1996) and Hassan *et al.* (2011) to control for the inflation rate in an economic growth model. Also, I follow Solow (1956) and Mankiw, Weil, and Romer (1992) to identify the labor force as a significant contributor to economic growth. I control for government revenue because it has been found to be a significant contributor to growth (Rubinson, 1977). *SAVINGS* is the instrumental variable because a higher level of gross domestic savings promotes financial development (Hassan *et al.*, 2011).

3.3. Econometric Methodology

First, I use the principal component analysis (PCA) to construct the composite financial indicator used in this study and the Kaiser-Meyer-Olkin sampling adequacy test certifies the suitability of the four financial development indicators for principal component analysis. This study employs pre-estimation analysis such as descriptive statistics and the Levin, Lin, and Chu unit root test. The descriptive statistics present a comparison of the means of selected variables used in this study for the 10 developed countries studied from 1980 to 2016 and the Levin, Lin, and Chu unit root test is applied to find out if the variables are stationary or nonstationary. Furthermore, I proceed by conducting endogeneity tests on *FINANCE* using the random and fixed effects methods presented by Wooldridge (2010). Due to the endogeneity introduced by the endogenous explanatory variable *FINANCE*, I employ the random effects instrumental variable estimation, selected by the Hausman test, and the past values of the financial development variable to estimate the structural equation.

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

The characteristics of the distribution of the variables for all the countries are presented in Table 2 below. Real gross domestic product, investment, and the size of the labor force are expressed in natural logarithm. Skewness is a measure of asymmetry in a distribution. A perfectly symmetrical dataset (for example, a normal distribution) will have a skewness of zero. All the variables, except *FD Investment* and *inflation*, are normally skewed since their skewness statistics are close to zero. Kurtosis measures the tailedness of a distribution. A normal distribution (mesokurtic) will have a kurtosis of 3. Since the kurtosis statistics of *FD Investment* exceed 3, it is leptokurtic (more outliers) relative to normal. The rest is platykurtic (fewer outliers) relative to normal.

4.2. Comparison of the Means of Selected Variables

Table 2: Descriptive Statistics

Sample: 1980 – 2016

	RGDP (log)	FINANCE	Investment (log)	Labor Force (log)	Govt Rev (% of GDP)	Trade (% of GDP)	FD Investm ent (% of GDP)	Inflation
Mean	27.83830	-2.08E-08	26.33038	16.79959	28.54986	60.97170	5.111475	2.749651
Median	27.53635	0.078792	26.06694	16.78106	26.84526	55.70860	1.732940	2.063679
Maximum	30.45954	3.406712	28.83560	19.17800	51.01926	156.2967	87.44259	15.43445
Minimum	26.01309	-3.173395	24.53937	14.76244	9.511686	16.01388	-7.388078	-5.205030
Std. Dev.	1.172534	1.569825	1.177848	1.289881	11.60042	31.81666	9.321023	3.012758
Skewness	0.474917	-0.051779	0.431867	0.136624	0.150168	0.686115	3.416477	1.467857
Kurtosis	2.178887	1.867716	2.039608	1.839760	1.642510	2.855954	21.44291	5.681104
Observations	370	370	370	370	370	370	370	370

Source: Author's computation (2019)

This sub-section compares the means of selected variables used in this study for the 10 developed countries studied with a view to presenting how the variables differ across the 10 developed countries from 1980 to 2016. Figure 1 shows the means of RGDP growth rates of the countries studied. For the period under review, Australia has the highest mean of RGDP growth rates while Switzerland recorded the lowest. The mean of Japan's Broad money as a percent of GDP was recorded as the highest while Norway was the poorest in this category (Figure 2). Figure 3 illustrates that Switzerland has the highest mean value of credit to the private sector by banks as a percent of GDP and the USA recorded the lowest mean value. The mean of Switzerland's stock market capitalization as a percent of GDP was the highest at 149.3% while Austria, at 18%, was the lowest (Figure 4).

Figure 5 shows that Switzerland and the USA have the highest turnover ratio while Australia got the lowest mean. This suggests that Switzerland and the USA have the most efficient and liquid stock markets among the 10 countries studied. The mean of Australia's labor force growth rate was the highest at 1.42% while Japan's was the lowest at -0.07% (Figure 6). This result underlines the low birth

rate in Japan. From Figure 7, Spain recorded the highest mean for the inflation rate, 4.9%, while Japan's is the lowest at 0.3%. The mean of US' net inflow of foreign direct investment as a percent of GDP was recorded as the highest while Japan's was the poorest in this category (Figure 8). Figure 9 illustrates that Norway has the highest mean value of government revenue (excluding grants) as a percent of GDP and Japan recorded the lowest mean value.

Fig. 1: Mean of REAL GDP Growth Rate (%) by COUNTRY

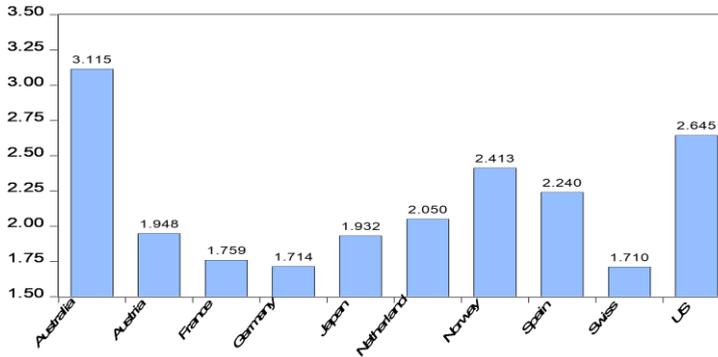


Fig. 2: Mean of Broad Money as a Percent of GDP by COUNTRY

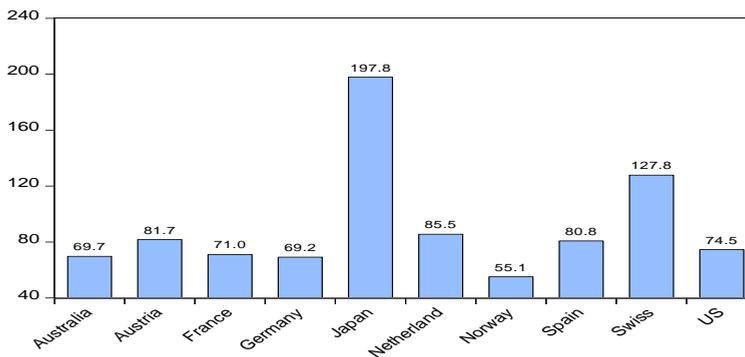


Fig. 3: Mean of Credit to Private Sector by banks as a Percent of GDP by COUNTRY

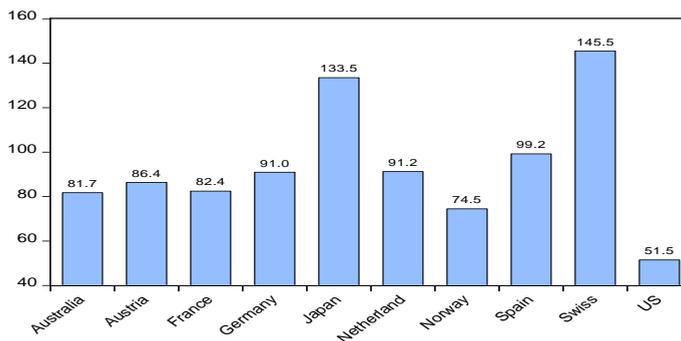


Fig. 4: Mean of Stock Market Capitalization as a percent of GDP by COUNTRY

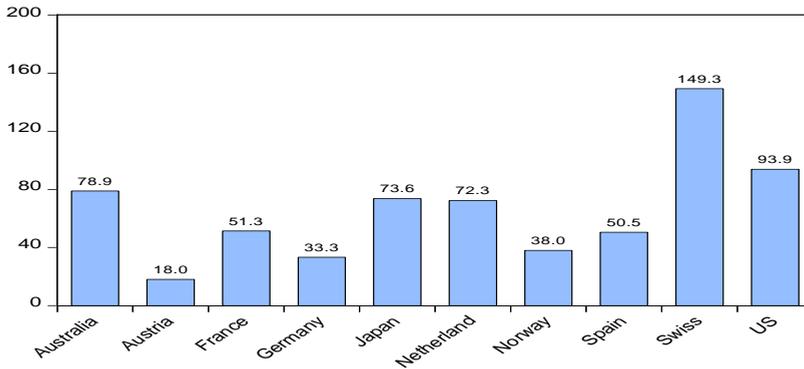


Fig. 5: Mean of Turnover Ratio by COUNTRY

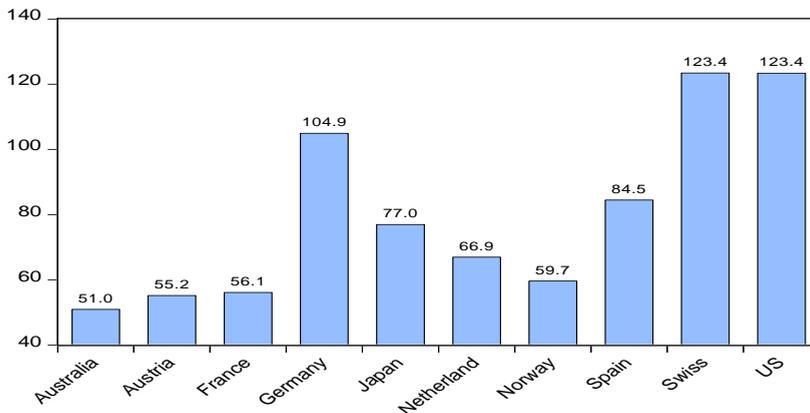


Fig. 6: Mean of Growth Rate of Labor Force (%) by COUNTRY

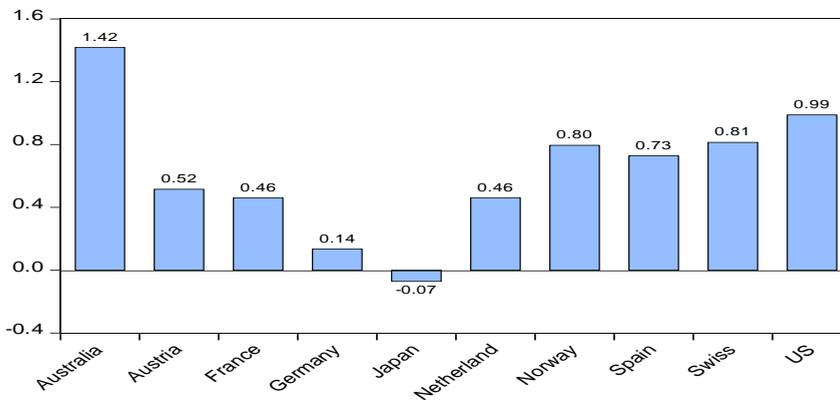


Fig. 7: Mean of Inflation Rate (%) by COUNTRY

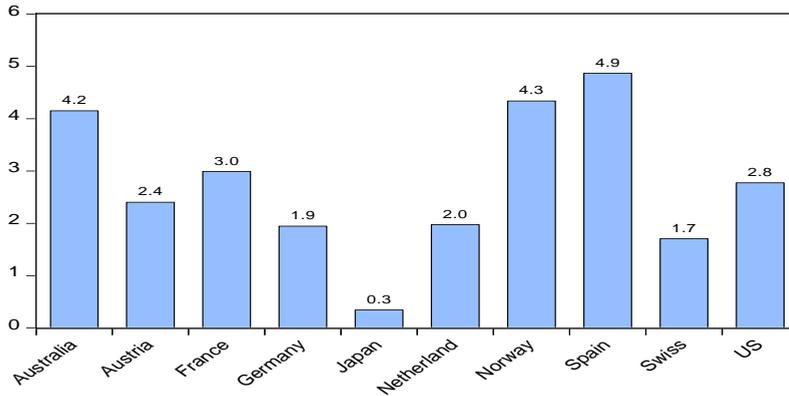


Fig. 8: Mean of Net Inflow of Foreign Direct Investment (% of GDP) by COUNTRY

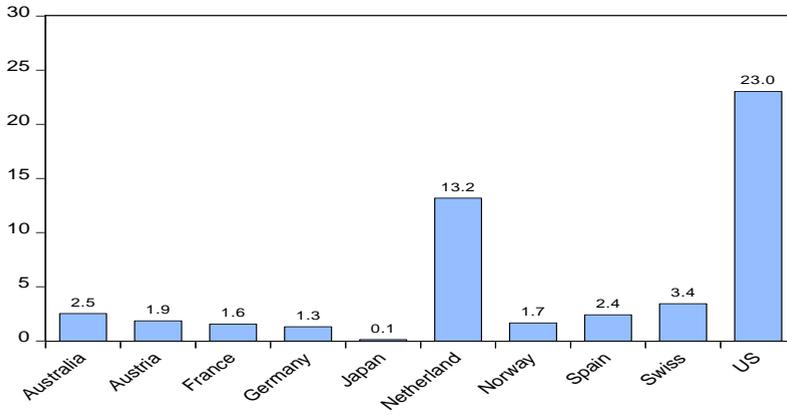
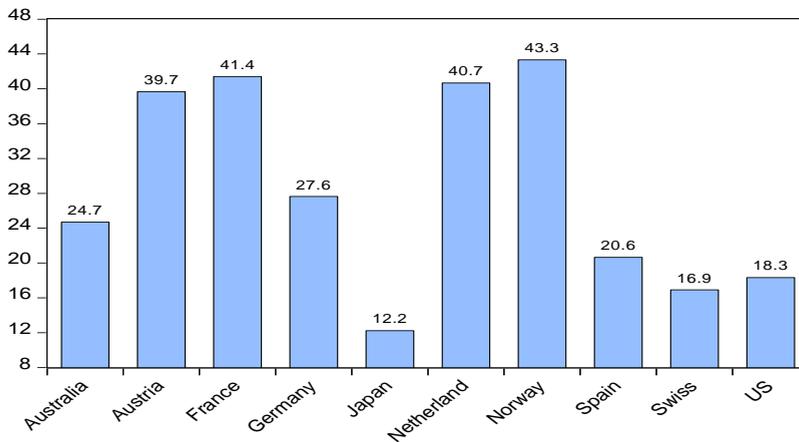


Fig. 9: Mean of Government Revenue as a Percent of GDP by COUNTRY



Source: Author's computations (2019)

4.3. Unit Root Test

I employ the Levin, Lin, and Chu (LLC) unit root test to determine if the variables are stationary or non-stationary (see Levin, Lin, and Chu, 2002). The LLC test has as the null hypothesis that the panels contain a unit root and it assumes that the panels are balanced. The results of the LLC test, computed with the Schwarz information criterion, are presented in Table 3. The results show that all the variables are integrated of order zero, $I(0)$; that is, they are stationary (time-constant means, variances, and autocorrelations) at levels. The implication of these results is that a regression involving these variables will not produce a spurious result since they are all stationary and there is no need for a cointegration (long-run or equilibrium) test (see Granger and Newbold 1974).

Table 3: Levin, Lin, and Chu (LLC) Unit Root Test

Variable	LLC Statistic at Level	Order of Integration
<i>RGDP (log)</i>	-4.55424***	I(0)
<i>FINANCE</i>	-1.36401*	I(0)
<i>Investment (log)</i>	-2.20504**	I(0)
<i>Labor Force (log)</i>	-1.65114**	I(0)
<i>Government Revenue</i>	-1.79114**	I(0)
<i>Trade Openness</i>	-1.71464**	I(0)
<i>Foreign Direct Investment</i>	-2.67621***	I(0)
<i>Inflation</i>	-6.53394***	I(0)
<i>SAVINGS (IV)</i>	-1.70510**	I(0)

Source: Author's computation (2019)

Note: ***, **, and * denote stationary at 1%, 5%, and 10% levels of significance respectively. Trade Openness was detrended before it became stationary.

4.4. Model Estimation

I proceed by testing for the endogeneity of *FINANCE* using both the random effects and the fixed effects methods.

4.4.1. Instrumental Variable Selection

I use the endogeneity test presented by Wooldridge (2010) applicable to linear models. An advantage of these tests is that they are fully robust to serial correlation and heteroscedasticity. Before conducting an endogeneity test, an instrumental variable (IV) must be selected and the IV must meet two conditions to

be a good IV. First, the IV must be correlated with the endogenous explanatory variable, *FINANCE*. This criterion suggests that the IV is strong. Second, the IV must not be directly correlated with the dependent variable, *RGDP*. The instrument chosen for the financial development variable is *SAVINGS*. I use (3) to test the first condition. *SAVINGS* is relevant and a strong IV if it is statistically different from zero. *SAVINGS* fulfills the second condition in that it does not directly affect the *RGDP*. This is true because the financial sector must allocate savings to different sectors for investment and growth to take place. This shows that a weak financial system negatively affects the impact of savings on the real economy.

4.4.2. Endogeneity Tests Using Random and Fixed Effects Methods

Testing for the endogeneity of *FINANCE* involves two steps. First, I estimate the reduced form of *FINANCE* using the random and fixed effects version of (2) and save the residuals.

The random and fixed effects versions of equation (2) are specified as (3) and (4) respectively:

$$(3) \quad FINANCE_{it} = \beta_1 SAVINGS_{it} + \lambda_1 X_{it} + U_i + \varepsilon_{it}$$

$$(4) \quad FINANCE^*_{it} = \beta_1 SAVINGS^*_{it} + \lambda_1 X^*_{it} + \varepsilon^*_{it}$$

Second, I estimate the augmented equations of random and fixed effects which entail controlling for the exogenous explanatory variables in (1) and the residuals from (3) and (4) but not including the IV, *SAVINGS*. If the residuals, *RESIDUAL1* and *RESIDUAL2*, are statistically significant in both (5) and (6); then, *FINANCE* is endogenous, and an instrumental variable (*SAVINGS*) must be used to estimate the structural equation (1).

$$(5) \quad RGDP_{it} = \beta_1 FINANCE_{it} + \theta_{it} RESIDUAL1_{it} + \lambda_1 X_{it} + U_i + \varepsilon_{it}$$

$$(6) \quad RGDP^*_{it} = \beta_1 FINANCE^*_{it} + \theta_{it} RESIDUAL2^*_{it} + \lambda_1 X^*_{it} + \varepsilon^*_{it}$$

The results of (3), (4), (5), and (6) are presented in Table 4 below. Regressions 1 and 3 present the results of the reduced form of the random effects (3) and fixed effects (4) respectively. As revealed, *SAVINGS*, the IV, is positively related to *FINANCE* and statistically significant in both the fixed and random effects. These suggest that *SAVINGS* is a relevant instrument and a strong IV. Regressions 2 and 4 present the results of the augmented equations of the random effects (5) and fixed effects (6) respectively. Since *RESIDUAL1* and *RESIDUAL2* are statistically significant in both results, I conclude that *FINANCE* is indeed

endogenous. Therefore, (1) must be estimated using an instrumental variable because it provides better estimates of the ceteris paribus effect of *FINANCE* on *RGDP* when there is endogeneity (Wooldridge, 2013).

Table 4: Random and Fixed Effects Endogeneity Tests

VARIABLES	(1) <i>FINANCE</i>	(2) <i>RGDP (log)</i>	(3) <i>FINANCE</i>	(4) <i>RGDP (log)</i>
<i>FINANCE</i>		0.157*** (0.0458)		0.108** (0.0436)
<i>RESIDUAL1</i>		-0.149*** (0.0367)		
Investment (log)	1.129*** (0.382)	0.416*** (0.126)	2.285*** (0.472)	0.273 (0.155)
Labor Force (log)	-1.603*** (0.201)	0.505*** (0.108)	1.848 (1.447)	0.225 (0.482)
Govt. Revenue	0.0173*** (0.00620)	-0.00104 (0.00152)	-0.0148 (0.0141)	0.00465* (0.00224)
Trade	0.00294 (0.00658)	0.000422 (0.00135)	0.00924 (0.00597)	0.000370 (0.00179)
FD Investment	0.0203*** (0.00545)	-0.000424 (0.00258)	0.0230*** (0.00776)	-0.000425 (0.00159)
Inflation	-0.170*** (0.0240)	0.0181*** (0.00653)	-0.104*** (0.0199)	-0.00123 (0.00321)
<i>SAVINGS</i>	0.781*** (0.243)		0.923*** (0.199)	
<i>RESIDUAL2</i>				-0.0687* (0.0345)
Constant	-23.48*** (3.136)	8.385*** (1.608)	-114.9*** (16.12)	16.76* (8.069)
Observations	370	370	370	370
R-squared	0.449		0.733	0.942
Number of id		10		10

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.4.3. Hausman Test

Having verified that the variables are stationary at levels and that *FINANCE* is endogenous, I estimate (1) using both the random and fixed effects with instrumental variable, *SAVINGS*, and employ the Hausman test to determine the efficient estimator (Wooldridge, 2010).

The Hausman test is a specification test developed for econometric model specifications and can be applied to an instrumental variable, panel data and simultaneous equation models (Hausman, 1978). For panel data models with

instrumental variables, the null hypothesis is that the unobserved effects are not correlated with the instrumental variable.

The result of the Hausman test is presented in Table 5 below. The Chi-Square Statistic and the p -value of the test suggest that the random effects estimator is appropriate for the model.

Table 5: Hausman Test

Variable	Fixed	Random	Var(Diff.)
<i>FINANCE</i>	0.1083911	0.1200574	-0.0116663
<i>Investment</i>	0.272557	0.1405242	0.1320328
<i>Labor Force</i>	0.2247137	0.6519518	-0.4272381
<i>Government Revenue</i>	0.0046499	0.0043807	0.0002693
<i>Trade Openness</i>	0.0003699	0.0006755	-0.0003056
<i>Foreign Direct Investment</i>	-0.0004248	-0.0008113	0.0003865
<i>Inflation</i>	-0.0012333	0.0020483	-0.0032816
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.15	7	0.9313

Source: Author's computation (2019)

4.4.4. Random Effects Instrumental Variable Model

The random effects instrumental variable estimation states that the unobserved heterogeneity, U_i , and the explanatory variables are not correlated. Due to endogeneity, I estimate (1) with an instrumental variable, *SAVINGS*.

The random effects instrumental variable model of equation (1) is specified as:

$$(7) \quad RGDP_{it} = \beta_1 FINANCE_{it} (SAVINGS_{it}) + \lambda_1 X_{it} + U_i + \varepsilon_{it}$$

The result (7) is presented in Table 6. Regression (6) is the general model while regressions 1 through 5 are the parsimonious models.

Parsimonious model (5) best explains the economic growth of developed countries. There is a positive relationship between *FINANCE* and economic growth in all the models and the magnitudes of the effect are both statistically and economically significant even after controlling for other factors associated with economic growth and accounting for simultaneity bias. This finding confirms that financial development remains a significant contributor to growth and supports the argument that financial development is a significant contributor to growth in developed countries. Similarly, investment, the size of the labor force, and government revenue are all positively associated with economic growth and the sizes of the effects are both statistically and economically significant. The

coefficient of government revenue is not as large as the coefficients of investment, labor force, and financial development.

Table 6: Random Effects Instrumental Variable Result (RGDP in log)

VARIABLES	(1) <i>RGDP</i>	(2) <i>RGDP</i>	(3) <i>RGDP</i>	(4) <i>RGDP</i>	(5) <i>RGDP</i>	(6) <i>RGDP</i>
<i>FINANCE</i>	0.114*** (0.0269)	0.135*** (0.0321)	0.113*** (0.0239)	0.110*** (0.0235)	0.108*** (0.0228)	0.120*** (0.0266)
Investment (log)	0.317*** (0.118)	0.0981 (0.155)	0.215* (0.112)	0.233** (0.105)	0.275*** (0.0910)	0.141 (0.119)
Labor Force (log)		0.498*** (0.126)	0.391*** (0.116)	0.364*** (0.125)	0.250* (0.149)	0.652*** (0.111)
Govt. Revenue			0.00461*** (0.00145)	0.00470*** (0.00142)	0.00456*** (0.00138)	0.00438*** (0.00151)
Trade Openness				0.000365 (0.000624)	0.000342 (0.000616)	0.000676 (0.000672)
FD Investment					-0.000451 (0.000923)	-0.000811 (0.00111)
Inflation						0.00205 (0.00375)
Constant	19.50*** (3.108)	16.89*** (3.428)	15.47*** (2.934)	15.44*** (3.175)	16.26*** (4.649)	13.06*** (1.961)
Observations	370	370	370	370	370	370
Number of id	10	10	10	10	10	10

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.4.5. Controlling for Simultaneity Bias Using the Past Values of *FINANCE*

So far, I have attempted to control for simultaneity bias using an instrumental variable. Another popular method of controlling for simultaneity bias is by using the lagged values of the endogenous variable.

The random effects model of equation (1) with the composite financial development indicator in lag is specified as:

$$(8) \quad RGDP_{it} = \beta_1 FINANCE_{it-1} + \lambda_1 X_{it} + U_i + \varepsilon_{it}$$

The result of (8) is presented in Table 7. Regression (6) is the general model while regressions 1 through 5 are the parsimonious models. Like the IV estimation, financial development is positively and robustly correlated with economic growth in all the models.

Table 7: Random Effects Result Using Lagged Values of FINANCE (RGDP in log)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	<i>RGDP</i>	<i>RGDP</i>	<i>RGDP</i>	<i>RGDP</i>	<i>RGDP</i>	<i>RGDP</i>
<i>FINANCE</i> _{<i>t-1</i>}	0.0307*** (0.0118)	0.0469*** (0.0102)	0.0472*** (0.0105)	0.0469*** (0.0114)	0.0461*** (0.0113)	0.0244* (0.0135)
Investment (log)	0.712*** (0.0739)	0.498*** (0.0665)	0.491*** (0.0656)	0.492*** (0.0655)	0.486*** (0.0665)	0.620*** (0.0735)
Labor Force (log)		0.423*** (0.0589)	0.441*** (0.0645)	0.447*** (0.0681)	0.451*** (0.0662)	0.333*** (0.0615)
Govt. Revenue			0.00270 (0.00217)	0.00303 (0.00219)	0.00320 (0.00217)	0.00199 (0.00203)
Trade Openness				0.00117 (0.00163)	0.000962 (0.00170)	0.00117 (0.00160)
FD Investment					0.00108 (0.000787)	0.00211 (0.00181)
Inflation						-0.00565*** (0.00167)
Constant	9.102*** (1.917)	7.626*** (1.374)	7.437*** (1.429)	7.309*** (1.562)	7.375*** (1.515)	5.884*** (1.210)
Observations	360	360	360	360	360	360
Number of id	10	10	10	10	10	10

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5. CONCLUSION AND RECOMMENDATION

This paper investigated the impact of financial development on the economic growth of 10 developed countries from 1980 to 2016 in the presence of simultaneity bias. Given the demand-following hypothesis, I conduct the endogeneity test on *FINANCE* using the random and fixed effects endogeneity test. Due to the simultaneity bias introduced by the endogenous explanatory variable *FINANCE*, I employ an instrumental variable estimation and the past values of the composite financial development indicator to estimate the correlation between financial development and economic growth. I find that, after controlling for major determinants of economic growth in developed countries and accounting for simultaneity bias, financial development remains a positive and significant contributor to long-run economic growth in developed countries, and the size of the impact is both statistically and economically significant.

The policy implication of this result is that policymakers in developed countries should continue to prioritize policies that ensure financial development

since it has the capability of boosting long-run economic growth. Although this paper has improved our understanding of the nature of the relationship between financial development and economic growth in developed countries, more work remains to be done on financial development (Levine, 1997). Specifically, economists must provide more practical answers to the following questions. Why do countries in the same income bracket have different looking financial structures (suggested by sub-section 4.2. of this study) and what are its implications for developing countries hoping to achieve financial development? Answers to these questions will improve our understanding of how countries can achieve financial development that can boost sustainable development in both developed and developing countries.

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ECONOMIC INTEGRATION AND INVESTMENT OPPORTUNITIES: A STUDY ON ASEAN+3 COUNTRIES

MD. SAIFUR RAHMAN*, FARIHANA SHAHARI**

Abstract: *This paper aims to investigate the investment opportunities in ASEAN+3 economies following the market liberalization in 1980s and 1990s. The estimation process is executed by using stock market indices and by employing Johansen Cointegration, VECM and Impulse response function. Member economies of ASEAN+3 are segmented based on income level in order to observe the market dominance of developed economy on that of developing economies. The dynamic findings indicate the followings: 1) the capital market liberalization improves the market transparency, thus to the favor of the foreign investment, 2) The diversification benefits of portfolio investment in APT regional financial markets squeezed, 3) both the higher and lower income economies have equal investment opportunities, and finally, 4) the financial markets of ASEAN+3 become excellent investment region. This study offers great policy implications for the regional policy makers and both foreign and local investors.*

Keywords: *financial market, investment opportunity, cointegration analysis, global Investors*

JEL Classification: *F1, F3, G1*

1. INTRODUCTION

Openness of ASEAN Plus three (APT) capital markets took effect since late 1980s, but due to the absence of sincere cooperation and irregularities, these markets became unstable and unsecured to the global investors. The stock markets of this region became further vulnerable in the 1990s after the Asian Financial Crisis. This caused less attractive for the portfolio investment. The wide instability

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in the stock market subsequently dried up the international reserves and reduced the value of national currencies vis-à-vis against US Dollar by more than 40 percent. The collapse in regional stock markets affected the nations and households' wealth and dented the banking system. Both local and foreign investors fled from this part of the continent due to lack of confidence and market instability. The implementation of new economic policies and adjustments by governments as part of the initiatives to tackle the crisis were painful lessons to both the governments and the people. As part of the initiatives to assist the catastrophic economic condition amongst the Southeast Asian economies, the ASEAN economies with three northeast economies, i.e., China, Japan and South Korea introduced a number of financial/monetary cooperative steps, notably known as Chiang-Mai Initiative (CMI), Asian bond market (ABM), and so forth. The rationale for establishing these initiatives are; to cooperate and support the regional countries and to ensure stability and attractiveness as an investment hub.

Essentially, when capital markets are liberalized, the members of regional economies become more integrated, thus their intra-financial and economic activities increase, Rahman *et al.*, (2015). When financial markets integrate and work collectively, the markets develop at a higher speed compared to working independently. It will also be more attractive to investors. Integration of financial markets also creates avenues for members to gain fresh capital and expansion of liquidity in the financial markets and/or the banking system. The integration process will facilitate cross-border investors in issuing financial products. This subsequently increases the trading volume in regional markets. The markets become more liquid and the participants (the market players) may access the market with low transaction costs and low equity premium. Members of the more developed members are likely to share and provide technical support to their economic partners. It is crucial for the financial markets in the group to be efficient in mobilizing capital or savings. An efficient market is a prerequisite to a country that is involved in the integration process because these efficient markets could absorb substantial foreign funds and could withstand pressures on financial variables, i.e., interest rate and exchange rate. As markets get more advanced, efficient and liquid, households and firms will benefit (Pagano et al. 2001 and 2002). This will subsequently attract investors from the regional group and the international participants, as the markets are integrated and fundamentally strong.

The degree of ASEAN+3 capital market openness is reflected by the actual intra-regional financial transactions. Figure 1 indicates the intra-regional Foreign Direct Investment (FDI); denoting that The Asian intra-regional investment is in a

relatively instable environment. None of the Asian regional bloc, including ASEAN+3 has presented a smooth intra-regional investment growth. Their investment growth in 2007, 2008 and 2009 is negative, positive and negative respectively. This is an indication of high volatility and inconsistency in the intra-regional FDIs among ASEAN+3 economies.

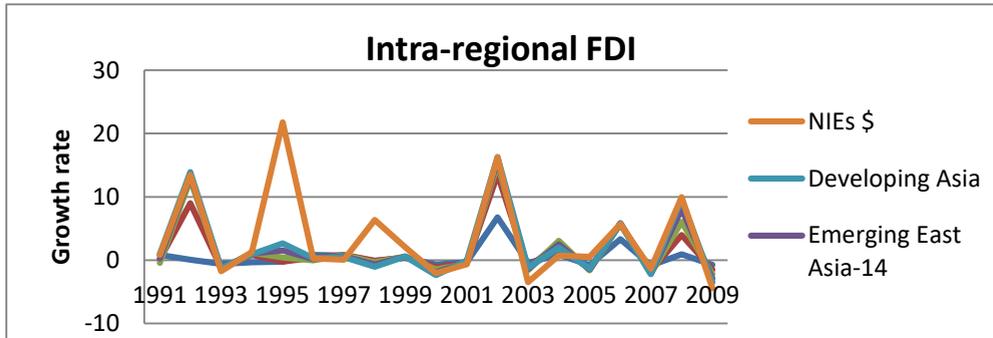


Figure 1. Intra Regional FDI share

Source: UNCTAD FDI database, Note: Foreign direct investment (FDI) share is the percentage of regional FDI inflows to total FDI from the investing region. A higher share indicates a stronger preference for the region and a higher degree of integration

Furthermore, the world trades in 2000, 2005, 2010 and 2011 are \$12891.47, \$20969.86, \$30210.12 and \$35977.62 million respectively. Conversely, the trades of ASEAN+3 in 2000, 2005, 2010 and 2011 are \$2461.16, \$4317.20, \$7330.19, and \$8791.16 million respectively. The figures indicate that one-fourth of the total world trade is from ASEAN+3 bloc. The trade growth of ASEAN+3 bloc is higher than that of the world; the growth of world's trade is about 19% and ASEAN+3's trade growth is about 20% (statistics are available on request). These statistics indicate that APT countries contribute significantly in terms of trade towards world economy. It further explains that the intra-trades among Asian economies are very low due to its external trade relationship. Most of the APT member countries have FTAs with other countries as discussed earlier. Each of the countries maintains their trade-relationship wherever there are potentialities as individual member countries are involved in bilateral trade-relation with external economies. For example, Singapore, Laos, Myanmar and Vietnam prioritize EU; Malaysia, Thailand and Cambodia prioritize US; and Indonesia, Philippines and Brunei prioritize Japanese market as their trading partners. If we take a glance at EU regionalism, we see the opposite trend of ASEAN bloc. The level of economic integration among EU economies is much higher than that of the ASEAN, where the intra-trades in EU bloc in 1950s and 2010s are about 50% and

60% respectively compared to the current 25% in ASEAN+3 today. The statistics of intra-investments and intra-trades along with the world trades indicate that the ASEAN+3 financial markets are not completely cooperative towards member economies and this may cause market vulnerabilities to the foreign investors. The member economies are not integrated, but are rather in cooperation with countries other than the APT region. This causes the regional economies to be less attractive to the foreign investors due to lack of market efficiency. Based on the statistics and the discussion above, this study will attempt to address the following questions:

- a. Do the early capital market openness and ASEAN+3 financial cooperation agreement lead to cooperation among the member stock markets and draw the attention of foreign investors?
- b. Do the ASEAN+3 economies achieve regional active cooperation, market efficiency and information transparency?
- c. Do the capital market openness of one high income country respond to that of the other high income countries or to that of the low income countries as well?
- d. Are the capital markets of ASEAN+3 economies stable and secured for the foreign investment?

This study contributes in several aspects; first, even though there are several studies in the area of stock market integration, they do not focus on the degree of capital market openness and investment potentialities in ASEAN+3 capital markets. Secondly, according to Guillaumin (2009) and Rahman *et al.*, (2014 a,b), market openness may cause the low income economies to respond to other low income economies and high income to other high income economies. In this case, the regional markets are unable to attract the foreign investments. This study investigates whether the low income economies open their capital markets to the high income countries in order to attract the foreign investors, which has not been examined before in the case of ASEAN+3 economies. Thirdly, this study employs several advance econometrics techniques: Vector Autoregression (VAR)-based Vector Error Correction Methods (VECM), Impulse Response Function (IRF) and Toda Yamamoto (TY) in the investigation process in order to justify the robustness of the findings. And finally, this study provides empirical findings for the ASEAN+3 policy makers, which may create awareness on the status of regional economies and help potential investors to decide on whether or not to invest in ASEAN+3 regional economies.

There are ample studies that focus on the global capital market openness in different economies. For example, a group of studies (Thompson, 1994; Ewing et al, 1999; Aggarwal and Kyaw, 2005; Morelli, 2010) focus on capital market openness

and investment opportunity in developed economies, while another group of studies (Carrieri et al, 2002; Bekaert and Harvey, 2003; Eizaguirre and Biscarri, 2006; Chambet and Gibson, 2008; Beiney and Candelon, 2011) concentrate on the capital market integration among emerging economies. This study predominantly reviews the literatures that focus on the Asian economies and financial market openness.

Janor and Ali (2007), Rim and Setaputra (2008), Chen et al (2009), Yu, et al (2010) investigated the stock market integration and found stock markets from the Asian region to be partially-integrated. Partial-integration facilitates the diversification opportunity for portfolio investment. Nevertheless, Ibrahim (2006) documented that stock markets of this region are fully segmented and it facilitates the foreign investors in diversifying their portfolio investment. The literatures on post financial crisis indicate that the Asian economies are more integrated due to contagion and market openness. Yu, et al, (2010) investigates the market integration by means of standardized trace statistic or Eigen value of cointegration test. Their findings show that the four dragon regions (Hong Kong, Taiwan, Singapore and South Korea) became highly integrated amongst them during the financial crisis. They further explained that the markets are highly integrated during the crisis periods because of volatility spill over and contagion effects. Asian emerging markets became integrated as well after the crisis, whilst the four dragon regions became segmented during the post-period as they initiated their own individualistic domestic policies that do not comply with other member countries. These findings are supported by Mukherjee and Mishra (2010) and Oh et al (2010), who found the ASEAN economies as more cooperated due to stock market spill over effect.

Additionally, Majid, et al (2009) examines the influences of sub-prime crisis on the ASEAN region, considering stock indices from 15th February to 31 December, 2008. The sub-prime crisis period is during post-APT agreement. During this period, the ASEAN region is weakly integrated with each other. The subprime crisis influences the stock markets of Malaysia and Indonesia. It further indicates that during the subprime crisis, the markets became more integrated due to contagion effect. Saini (2002) and Lim (2009) and investigate the integration process of stock markets in ASEAN-5 during the post-crisis using data from 1990 to 2008. They found that member economies are highly integrated. The crisis caused instability in some of countries such as Indonesia. The domestic economy was badly affected by the crisis and the stock markets fell sharply. These shocks to the domestic economy lead the member countries of the ASEAN region to be interdependent among themselves. Rim and Setaputra (2008) investigate the stock

market integration in East Asian countries, US and Japan, employing GARCH. They used daily stock indices from 1992 to 2006, which have been subdivided into three periods; pre-crisis, during crisis and post-crisis. The findings indicate that the stock markets in East Asia are improving their integration process. During the crisis period, the markets were integrated due to contagion effects, which was supported by the significant variance term. Along with that, significant error and variance terms indicates that stock markets of these regions are facing spill over effects after the crisis period and therefore, the markets are more integrated during post-crisis period, which is also supported by Stehle (1977).

Moreover, Janor and Ali (2007) investigated on whether or not the stock markets became more integrated after the Asian financial crisis. They investigated further to determine whether financial liberalization contributes to the integration of the markets in this region. Singapore spearheaded by relaxing the financial constraints (tight rules of interest rates and exchange control) amongst member countries in the ASEAN region. This action is followed by Malaysia in liberalizing the capital markets (Phylaktis, 2002). They found contradicting results between bivariate and multivariate cointegration test. Normally, the findings of bivariate cointegration test can present maximum one cointegrating vector out of two $I(1)$ series which causes misspecification of the result. Hence, they prefer multivariate test as it overcomes the problems of misspecification of the results. The multivariate test reveals that more than one market is integrated with each other after the crisis period. Singapore is the most influential market in this region and affects all the markets except the Philippines. The integration has increased during the post-crisis compared to pre-crisis. Moreover, in global integration, Japan is more influential in this region as compared to the U.S. market. The crisis has led to more integration among the regional blocs, ASEAN and globally but to re-affirm, the integration process is incomplete, which means there is still room for diversification benefits. The financial liberalization leads to integration but the reverse takes place when the capital control is imposed. The findings of Ibrahim (2006) indicate that Malaysian stock market is segmented after the capital control is imposed. Thus, the stock price movements on the Malaysian stock market (KLSE) did not respond accordingly to that of the other countries during this period.

The organization of this paper is as follows: data and variables are discussed in Section 2.0 followed by methodology in Section 3.0. The analysis of findings is discussed in Section 4.0, while concluding remarks along with policy recommendation are described in Section 5.0

2. DATA AND VARIABLES

In order to examine the capital market cooperation for ASEAN+3, this study employs daily stock indices for the period of 31st December 1992 to 4th July 2012. The stock indices are collected during this period, as the capital market openness of this region is reflected in this period. The movement of the stock indices is presented in Figure 2:

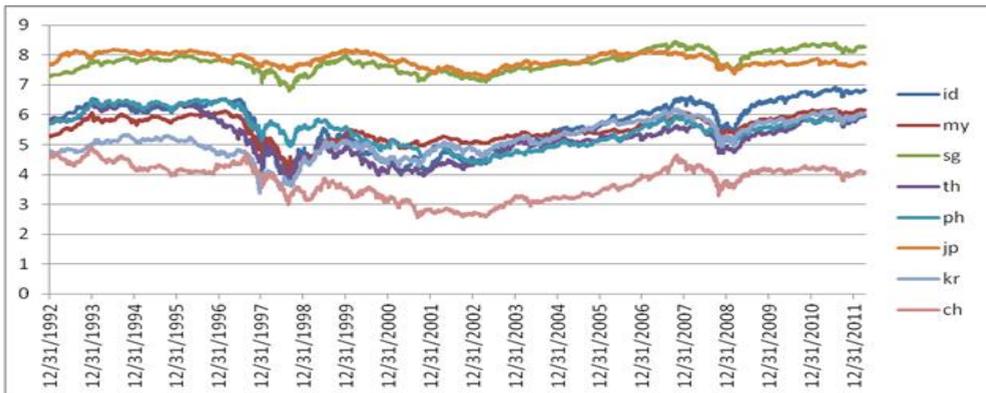


Figure 2. Stock Indices of ASEAN+3

Note: To draw the graph, all of the stock indices have been transformed into natural logarithm over 12/31/1992 to 4/9/2012 and plotted against time.

The stock indices are indexed by Morgan Stanley Capital International (MSCI) world index, which is collected using DATASTREAM. Total number of observation is 5028, which are collected on a daily basis and in a common currency i.e., US dollar and therefore, are transformed into natural log form in order to apply the investigation process. For the purpose of examining the comparatively enhanced investment opportunities in high or low income countries, this stock indices of ASEAN+3 have been disaggregated into two parts; high income economies (Japan, South Korea and Singapore) and low income economies (Malaysia, Indonesia, Thailand, Philippines and China). The classification of countries are based on Gross National Income (GNP) facilitated by World Bank (2010); countries are classified under high income if their per capita GNP is above US\$ 12,276 and low income if the per capita GNP is below US\$ 12,276. To verify the data series, the stock indices are tested for descriptive statistics and cross-correlation as shown in Table 2:

Table 2. Descriptive and Coefficients of Correlation

	High income economies			Low income economies				
	JP	KR	SG	MY	PH	ID	CH	TH
Mean	7.837	5.166	7.758	5.520	5.523	5.676	3.752	5.238
Median	7.818	5.119	7.757	5.480	5.568	5.885	3.916	5.244
Maximum	8.192	6.197	8.448	6.198	6.548	6.922	4.922	6.480
Minimum	7.234	3.369	6.796	3.993	4.335	3.752	2.554	3.783
Std. Dev.	0.220	0.575	0.342	0.435	0.575	0.800	0.570	0.679
Skewness	-0.357	-0.319	0.007	-0.606	0.004	-0.412	-0.322	-0.047
Kurtosis	2.236	2.821	2.322	3.069	2.032	1.859	2.007	2.006
Jar-Bera	229.16 2	91.799	96.204	308.97 8	196.17 9	415.06 2	293.44 6	208.88 6
Observn	5028.0 0	5028.0 0	5028.0 0	5028.0 0	5028.0 0	5028.0 0	5028.0 0	5028.0 0
Cross – correlation								
Indices	JP	KR	SG	MY	PH	ID	CH	TH
JP	1.000							
KR	0.251	1.000						
SG	0.473	0.861	1.000					
MY	0.449	0.717	0.823	1.000				
PH	0.653	0.171	0.497	0.650	1.000			
ID	0.469	0.698	0.821	0.915	0.744	1.000		
CH	0.597	0.328	0.594	0.700	0.880	0.835	1.000	
TH	0.579	0.499	0.606	0.830	0.829	0.884	0.820	1.000

Note: Jar-Bera and Ob represent the normality test Jarque-Bera and Observation respectively. The stock indices of Japan, South Korea, Singapore, Malaysia, Philippines, Indonesia, China and Thailand are indicated by JP, KR, SG, MY, PH, ID, CH and TH respectively.

The average returns of stock markets in ASEAN+3 regional markets differ from one economy to another. The highest mean returns are noted by Japanese stock market, followed by Singapore. The least investment return is in the Chinese stock market. In general, the mean returns in high income economies are higher than that of low income economies, which indicates that the stock markets of high income economies are offering better returns. Furthermore, the cross-linkage of regional stock markets is indicated by the correlation of coefficients. The correlation of coefficients of Malaysia-Indonesian stock returns is the highest (91.5%) followed by that of Indonesia-Thailand (88.4%), Philippines-China (88.0%), Singapore-Korea (86.1%) and Indonesia- China (83.5%). Though the returns are paid by high income economies, the investment returns among low

income economies are more correlated. These findings clearly indicate that the stock markets of ASEAN+3 economies are not efficient as a whole, following the regional market shocks that increase the investment risk in this region.

Finally, the study undertakes the diagnostic and stability test to confirm whether or not the models employed in this study are correctly specified. Majority of the test of L-Jung Box and LM¹ test for autocorrelation, Heteroskedasticity² test for ARCH effect and Ramsey RESET³ test for stability shows that the models used to determine the investment opportunities are free from the problems of autocorrelation, ARCH effect and instability in the respective data series. The Jarque-Bera⁴ normality test indicates that the error terms are not normally distributed but according to previous literatures, the models are acceptable even though normality test shows the non-normality.

The econometric models

Stationary test

$$\Delta y = \delta_0 + \eta y_{t-1} + \sum_{i=1}^m \beta_i \Delta y_{t-i+1} + u_t \quad (1)$$

$$\Delta y = \delta_0 + \xi t + \eta y_{t-1} + \sum_{i=1}^m \beta_i \Delta y_{t-i+1} + u_t \quad (2)$$

Equation (1) and (2) are known as Augmented Dickey fuller (ADF) test that are used for stationarity in the data series. Equation (1) follows the random walk with drift while equation (2) follows the random walk as well but with both drift and deterministic time trend. Both of the equations follow the assumptions of homoscedasticity, meaning the variances of error terms (ε_t) are independent.

$$\Delta y = \delta_0 + \xi t + \eta y_{t-1} + u_t \quad (3)$$

¹ The null hypothesis of LM test is, H_0 : there is no autocorrelation in the residuals

² The null hypothesis is, H_0 : there is no heteroskedasticity problem in error terms. Therefore, rejection of null hypothesis indicates the presence of ARCH effect.

³ The null hypothesis is, H_0 : the error term is normally distributed. Ramsey (1969) came up with Regression Specification Error Test (RESET) test for model specification purposes where rejection of null hypothesis indicates the non-normality in the error terms of stock data series.

⁴ The null hypothesis of Jarque- Bera test indicates, H_0 = residuals are normally distributed. Therefore, the rejection of null hypothesis indicates the non-normality in the error terms.

Equation (3) is known as Phillis-Perron (PP) and is used for stationary test. It allows correlation of heteroskedasticity in contrast to ADF. Therefore, the PP is a better approach when ADF fails for stationarity test due to heteroskedasticity. The series is said to be stationary under both of ADF and PP when the null hypothesis of the unit root problem or non-stationary is rejected. In order to perform the test, the lag length (m) is selected based on the criteria of Akaike Information Criterion

(AIC), $AIC = n \sum_{i=1}^k \hat{u}_i^2 + 2k$, where, u_i is the residuals and k is the number of

parameters. The third approach of testing the stationarity is Kwiatkowski- Phillis-Schmidt-shin (KPSS) through the following formula:

$$\Delta y = \delta_0 + \xi t + \eta \sum_{i=1}^t u_{t-1} + \varepsilon_t \quad (4)$$

The data series is stationary under this mechanism when the null hypothesis of stationary is not rejected. It means the data series (y_t) in null hypothesis is the trendy stationary around its deterministic trend while the alternative indicates non-stationary.

Cointegration technique

The cointegration test proposed by Johansen (1991) and Johansen and Juselius (JJ) (1990) is used for examining the investment opportunities among the markets via the following equation:

$$\Delta y_t = \delta_0 + \Pi y_{t-k} + \Phi_1 \Delta y_{t-1} + \Phi_2 \Delta y_{t-2} + \dots + \Phi_k \Delta y_{t-k} + \varepsilon_t \quad (5)$$

Where, y_t indicates an $n \times 1$ vector of variables, δ_0 symbolizes vector of constant, Π is equal to $\alpha\beta'$ in which α is an $n \times 1$ column vector that represents the speed of short-term adjustment of disequilibrium and β' is an $1 \times n$ cointegrating row vector that represents the coefficient of long-run investment opportunity. Φ_i is an $n \times n$ matrix which represents the short-term, ε_t is a white noise error term and finally k is the order of Autoregression. The presence of long-

run relationship is identified by the cointegrating vector which is found through equations (6) and (7):

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^n \ln(1 - \hat{\lambda}_i) \quad (6)$$

$$\lambda_{max}(r, r+1) = -T \sum_{i=r+1}^n \ln(1 - \hat{\lambda}_i + 1) \quad (7)$$

The rank (r) of long-run relationship in equation (6) is estimated by trace statistics (TS) referred by λ_{trace} that indicates the maximum number of cointegrating vectors. The likelihood test statistics is considered for the hypothesis in order to justify the number of maximum cointegrating vector. The maximum eigenvalue in the equation (7) indicated by λ_{max} represent the test statistics for the hypothesis of rank (r) against cointegrating vector $r - 1$. If the values of λ_{trace} and λ_{max} are between $1 < r < n$, it will indicate the presence of cointegrating vector, the VECM can be formed as follows:

$$\Delta y_t = \delta_0 + \psi ECT_{t-1} + \Phi_1 \Delta y_{t-1} + \Phi_2 \Delta y_{t-2} + \dots + \Phi_k \Delta y_{t-k} + \varepsilon_t \quad (8)$$

If the model represents no long-run opportunity ($r = 0$), then it is addressed in the following form:

$$\Delta y_t = \delta_0 + \Phi_1 \Delta y_{t-1} + \Phi_2 \Delta y_{t-2} + \dots + \Phi_k \Delta y_{t-k} + \varepsilon_t \quad (9)$$

The equation (9) represents the VAR model when the null hypothesis of no long-run relationship is not rejected or rank (r) is zero. Vector Error Correction Method (VECM) cannot be used in this case; thus, VAR is used instead.

The findings of these econometric techniques indicate the degree of stock market cooperation that assists the domestic and foreign investors to decide whether or not to invest in ASEAN+3 capital markets. The markets become competitive, efficient and transparent when they are cooperative. The cost of capital to individuals/households and firms are reduced. Investors in the domestic economy as well as foreign countries or partners in the group will be offered a low cost of

borrowing (Guiso, et al., 2004). Regardless of the size of the economies (or markets), each of the countries can access to the financial system of each other in term of accessing cheaper costs of capital or loans. Furthermore, the capital market openness promotes high standards of financial regulations such as accounting standards, corporate governance, prudential market surveillance, and banking supervision. Therefore, the regional capital market openness and market cooperation invites both domestic and foreign potential investors to invest in regional stock markets. When the markets are co-integrated in the short-run, the long-run investment opportunity arises as the markets are cooperated in long-run process.

Analysis of findings

Unit-root test

The investigation of long-run and short-run cooperation requires the identification of whether the series are stationary or non-stationary. If the series are non-stationary at the level forms or integrated at order one, we can proceed to investigate the stock market cooperation in the long-run. The findings of stationary tests through ADF, PP and KPSS are presented in Table 3:

Table 3. Unit Root Test result

Var	ADF		PP		KPSS	
	Level	1 st diff	Level	1 st diff	Level	1 st diff
My	-1.5340	-12.055*	-1.4432	-63.956*	1.314*	0.1295
Sg	-2.1372	-15.423*	-1.8700	-65.532	1.0811*	0.0782
Th	-1.1967	-16.372*	-0.9482	-61.303*	1.7265*	0.3013
Id	-1.4902	-10.585*	-1.1270	-61.893*	1.7814*	0.2431
Ph	-1.0260	-17.421*	-0.7960	-59.127*	1.7415*	0.2641
Ch	-1.5949	-18.1951*	-1.5125	-62.936*	1.9102*	0.2784
Jp	-2.3534	-31.5068*	-2.4335	-73.468*	0.5633*	0.0779
kr	-2.2887	-11.7347*	-2.0604	-65.752*	0.9807*	0.0787

*Note: To test the unit root through Phillis-Perron (PP) and Kwiatkowski- Phillis-Schmidt-shin (KPSS), the bandwidth is selected based on Newey-West Bandwidth. Phillis-Perron(PP) uses MacKinnon (1996) one-sided p-values. Test-statistics at the level are based on trend and intercept while at the first difference based on intercept. Lags length has been selected based on AIC. *, **, *** represent 1%, 5% and 10% significance level respectively.*

In order to examine the presence of unit root problem, the stock indices are transformed into natural logarithm form. The unit root test is performed in two

stages; at the level and first difference. The null hypotheses ($H_0: \delta=0$) of ADF and PP represents non-stationary data if null hypothesis is not rejected. The findings of ADF and PP indicate that the null hypothesizes of unit root problem at the level form are not rejected in any of the stock return services but at the first difference, all of the series are rejected at 1% level of significance, meaning that the stock return series are non-stationary at the level form but stationary at the first difference or I(1). The KPSS unit root technique works inverse to ADF and PP. The null hypothesis of KPSS is that, data series are trendy stationary or there is no unit root problem. The findings indicate that the null hypothesis of no unit root problem is rejected at 1% level of significance for all of the series, while at the first difference, the null hypothesis are not rejected which confirms that all of the stock return series of ASEAN+3 are integrated at order one or I(1).

Cointegration test

The unit root tests through ADF, PP and KPSS presented in Table 3 points out that all of the stock return series of ASEAN+3 are I(1), thus allowing us to proceed with the investigation of the long-run investment opportunity. The findings of λ_{trace} and λ_{max} in Table 4 indicate that the null hypotheses of no long-run relationships are rejected in both of λ_{trace} and λ_{max} at rank two, which means, at most two cointegrating vectors are identified in the system. The complete integrated markets requires m-1 cointegrating vectors but the trace statistics presents only two cointegrating vectors, which means the ASEAN+3 stock markets provide a weak cooperation in the long-run. This may not attract virtuous investment opportunities for foreign investors in the ASEAN+3 stock markets.

Table 4. Johansen Cointegration test

Rank (r)	All of the economies of ASEAN+3 group			
	Lag length is 7 days			
	λ_{trace}		λ_{max}	
	Stat	CV (5%)	Stat	CV (5%)
r = 0	199.519**	159.5297	57.04278**	52.36261
r ≤ 1	142.4762**	125.6154	50.96853**	46.23142
r ≤ 2	91.50772	95.75366	35.71146	40.07757
r ≤ 3	55.79625	69.81889	23.44455	33.87687
r ≤ 4	32.3517	47.85613	14.6663	27.58434

$r \leq 5$	17.6854	29.79707	11.2916	21.13162
$r \leq 6$	6.3938	15.49471	5.046616	14.2646
$r \leq 7$	1.347184	3.841466	1.347184	3.841466
Rank (r)	Low income economies			
	Lag length is 7 days			
$r = 0$	73.29835**	69.81889	26.52106	33.87687
$r \leq 1$	46.77729	47.85613	25.83022	27.58434
$r \leq 2$	20.94706	29.79707	11.6346	21.13162
$r \leq 3$	9.312461	15.49471	6.31982	14.2646
$r \leq 4$	2.992641	3.841466	2.992641	3.841466
Rank (r)	High income economies			
	Lag length is 6 days			
$r = 0$	27.82836	29.79707	19.35994	21.13162
$r \leq 1$	8.468416	15.49471	8.144982	14.2646
$r \leq 2$	0.323434	3.841466	0.323434	3.841466

Note: The lag number is selected based on AIC. ** indicates the rejection of null hypothesis at 5% significance level. Null hypothesis will be rejected if trace or max-Eigen statistics exceed its critical value at the 1% or 5% significance level.

To add to the robustness of this study, the stock markets of low income and high income countries are investigated separately to justify whether they offer long-run investment opportunity distinctly. The result of λ_{trace} indicates one cointegrating vector, while the λ_{max} does not provide any evidence of long-run cooperation. According to Alexander (2001), the indicators of λ_{trace} are used in order to justify the long-run relationship in the case of different cointegrating vectors. We conclude that one cointegrating vector exist among low income economies, whilst none of Trace and Max-Eigen value provides evidence of long-run relationship amongst high income economies.

Therefore, the findings indicate that low income economies offer insignificant long-run investment opportunity in ASEAN+3 stock markets. Similarly, the high income economies too do not provide any long-run support for foreign investment. The capital markets of high income economies are strictly tightened by their domestic regulation in the case of capital outflow and inflow. Even though the financial cooperation agreement of ASEAN+3 emphasizes on capital market openness and open for regional investment opportunities, in reality, the stock markets do not welcome foreign investment in long-run. Their

markets are not cooperative in long-run, as focus is more on their individual stock markets (Lim 2009).

Granger causality test result based on VECM

The existence of cointegrating vector in JJ model allows us to investigate the coefficient of long-run error correction term (ECT), which indicates the speed of adjusting the long-run equilibrium.

Table 5 presents the short-run investment opportunity along with ECTs.

Table 5. Granger causality test result based on VECM

$$\Delta y_{i,t} = \delta_1 ECT_1 + \delta_2 ECT_2 + \sum_{i=1}^3 \Phi_1 \Delta my_{t-1} + \sum_{i=1}^3 \Phi_2 \Delta th_{t-1} + \sum_{i=1}^3 \Phi_3 \Delta ch_{t-1} + \sum_{i=1}^3 \Phi_4 \Delta id_{t-1} + \sum_{i=1}^3 \Phi_5 \Delta ph_{t-1} + \sum_{i=1}^3 \Phi_6 \Delta sg_{t-1} + \sum_{i=1}^3 \Phi_7 \Delta jp_{t-1} + \sum_{i=1}^3 \Phi_8 \Delta kr_{t-1} + \varepsilon_{i,t}$$

Ind var Dep var		Short-run Lagged differences								Lag- ged ECTs
		Low Income Countries				High Income Countries				
		Φ_1 ΔMy	Φ_2 ΔTh	Φ_3 ΔCh	Φ_4 ΔId	Φ_5 ΔPh	Φ_6 ΔSg	Φ_7 ΔJp	Φ_8 ΔKr	
Low Income Countries	ΔMy		1.468 (0.689)	3.326 (0.344)	15.1 (0.002) *	6.316 (0.097) ***	14.062 (0.003) *	5.158 (0.161)	40.84 6 (0.000) *	0.001 (0.306)
	ΔTh	2.542 (0.468)		14.189 (0.003) *	28.14 1 (0.000) *	0.369 (0.946) *	14.345 (0.003) *	5.711 (0.127)	40.54 5 (0.000) *	0.003 (0.000) *
	ΔCh	9.375 (0.025) **	11.162 (0.011) **		1.135 (0.769)	1.084 (0.781)	24.812 (0.000) *	45.997 (0.000) *	9.296 (0.026) **	-0.0003 (0.638)
	ΔId	8.695 (0.034) **	5.393 (0.145)	6.851 (0.077) ***		5.427 (0.143)	16.907 (0.001) *	20.299 (0.000) *	63.02 1 (0.000) *	0.001 (0.3188)
	ΔPh	18.075 (0.000) *	19.883 (0.000) *	4.148 (0.246)	54.00 8 (0.000) *		41.820 (0.000) *	19.881 (0.000) *	15.96 4 (0.001) *	0.002 (0.002) **
High Income Countries	ΔSg	8.643 (0.034) **	0.887 (0.829)	15.714 (0.001) *	12.70 3 (0.005) *	1.737 (0.629)		21.535 (0.000) *	8.472 (0.037) **	0.002 (0.001) **
	ΔJp	3.161 (0.368)	12.228 (0.007)	1.085 (0.781)	1.669 (0.64)	10.38 6	80.362 (0.000)		9.364 (0.02)	0.001 (0.146)

) *		4)	(0.01 6) **) *		5) **	
ΔK R	11.062 (0.009) *	33.375 (0.000))*	10.916 (0.012) **	2.810 (0.42 2)	3.818 (0.28 2)	63.761 (0.000)*	8.305 (0.040) **			0.005 (0.000) *

Note: The result has been presented through WALD test which is based on chi-square while ECT is based on t-statistics. Lag length of VECM is 3 which is selected based on minimum AIC. Asterisks *, **, and *** represent 1%, 5% and 10% significance level.

The short-run granger causality in Table 5 focuses on the group magnitude of capital market cooperation and indicates the degree of cooperation between the two groups of stock markets. The rejection of null hypothesis against alternative hypothesis indicates that there is granger causality between the stock indices. The findings of Wald test indicate the two-way capital market cooperation between Singapore and Japan, Singapore and Korea, Japan and Korea, and so forth where most of the markets influence at 1% level of significance. This is supported by Oh et al. (2010). The lists of the stock markets that have bidirectional cooperative relationship are presented in Table 6 in the first column. The results indicate that all of the high economies are completely cooperative amongst themselves and offers cooperation to low income economies as well, e.g. Singapore-Malaysia, Korea-China, Japan-Philippines, etc. South Korea is the most cooperative capital market amongst all of the stock markets since it influences all of the stock markets at 1% significance level except at 5% for Singapore. The stock markets of lower income countries are less cooperative compared to that of high income countries in the feedback relationship.

Table 6. Summary of VECM based-Granger causality direction

Mutual investment opportunity	One way influences	No market cooperation
Singapore ↔ Japan Singapore ↔ Korea Japan ↔ Korea Singapore ↔ Indonesia Singapore ↔ Malaysia Singapore ↔ China Korea ↔ China Korea ↔ Thailand Korea ↔ Malaysia Japan ↔ Philippines Malaysia ↔ Philippines Malaysia ↔ Indonesia	Japan → China Japan → Indonesia Singapore → Philippines Singapore → Thailand Korea → Philippines Korea → Indonesia Thailand → Japan Malaysia → China Thailand → Philippines Indonesia → Philippines Indonesia → Thailand China → Indonesia	Malaysia — Philippines Malaysia — Thailand Malaysia — Japan Philippines — China

Mutual investment opportunity	One way influences	No market cooperation
Thailand ↔ China		

Note: —, → and ↔ lack of stock market cooperation, one way cooperation and two ways cooperation respectively

In addition, all of the high income economies influence majority of the low income economies in unidirectional way at 1% and 5% level of significance, e.g. Japan influences Indonesia, Singapore to Thailand, Korea to Philippines, etc. which comply with the findings of Gee et al. (2010). On the other hand, Thailand, from the lower income economies influences Japan. Some of the stock markets of low income economies cooperate with that of other low income economies, e.g. the stock market of Malaysia cooperates with Chinese stock market at 1% significance level in one way and Thailand and Indonesia cooperate with Philippines in another way. Finally, few economies do not have any comovement among their capital markets, e.g. Malaysia- Philippines, China-Philippines, etc. The overall findings indicate that: 1) all of the stock markets respond in the short-run to the capital market liberalization and could attract foreign investors, 2) The stock markets of high income countries are more influential compared to that of low income countries, which indicates that high income countries offer better investment opportunities in the short-run, 3) few of the stock markets present the lack of market cooperation which attracts the risk-taking investors to diversify their investment, and finally, 4) the positive and non-significant coefficients of ECTs⁵ do not provide any evidence of long-run adjustments, which means the regional economies are offering short-run investment opportunities but do not respond to the long-run adjustments.

Analysis of Impulse Response function

Impulse response function represents the impact of shocks from independent variables on the dependent variables. Figure 2 indicates that stock returns of ASEAN+3 economies are affected mostly by their own

⁵ This study found two Error correction Term (ECTs). Following Arize (1995), this study uses the unique ECT based on largest Eigen-value.

shocks and the member economies. The stock returns of China and Philippines immediately respond to their own shocks as well as member economies. Similarly, Thailand and Malaysia's shocks highly influence the stock returns of Indonesia. The stock price of Japan responds to the shocks of Philippines and Thailand in five days, meaning the stock prices of Japan takes longer time in responding to the shocks of Philippines and Thailand compared to other countries which takes a day or two. The shocks in Singapore influence the stock prices of Malaysia, Indonesia, Thailand and Philippines, whilst the stock prices of Singapore are mostly affected by the shocks of Indonesia and China.

Additionally, the stock prices of Indonesia and China decrease for 2 days and stabilize thereafter due to the shocks of Japan. The shocks in Malaysia lead to a reduction in the stock prices of South Korea. The speed of adjustment in the stock prices is quite fast according to IRF results. Most of the countries' stock prices increase in two or three days and stabilize thereafter. The findings of IRFs indicate that the majority of the stock markets of ASEAN+3 are responsive to the shocks of regional economies. The findings of IRFs are supported by that of VECM and further indicates that the stock markets of regional economies are partially cooperative and thus creates investment opportunities for the foreign investors especially in short-run.

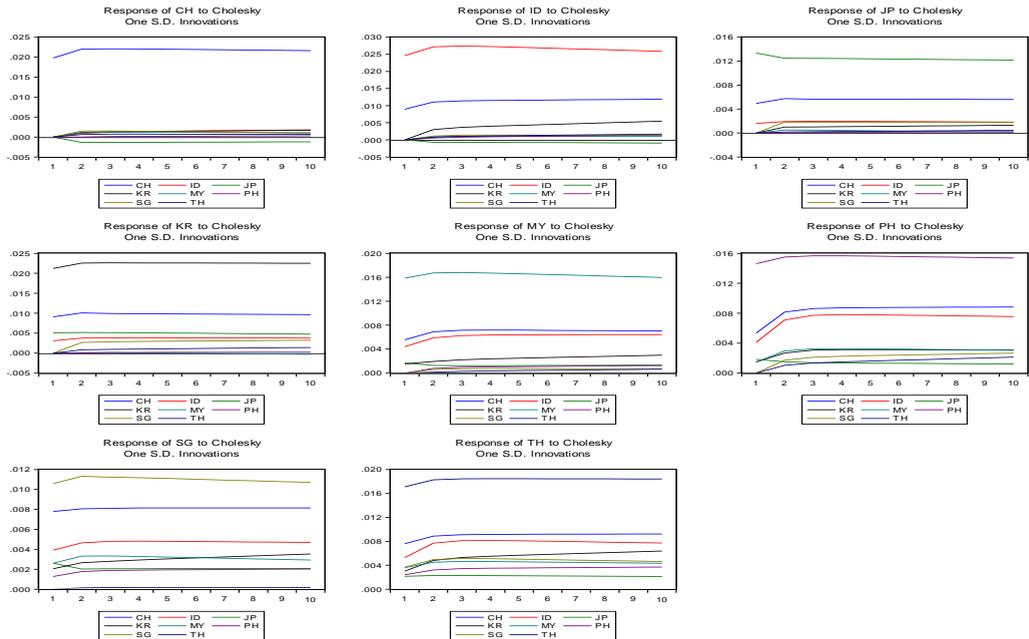


Figure 3. Impulse Response Function

Note: Impulse response is presented through cholesky with one S.D innovations while Degree of freedom is adjusted.

3. CONCLUDING REMARKS

This study examines the stock market cooperation amongst ASEAN+3 economies after the capital market openness and its impact on the investment opportunities in the regional economies. The VAR-based VECM, IRFs techniques have been employed in the investigation process. The findings indicate several outcomes: 1) the capital market openness in ASEAN+3 region leads to cooperation in the regional stock markets, 2) the stock markets of high income economies are more influential in changing the prices of stock markets of low income economies, 3) The stock markets are more volatile due to the prices changes and shocks in the economies of member countries in short-run, 4) the stock markets are partially cooperative in the long-run, and finally, 5) the regional markets adjust prices of stock returns due to the shocks in the regional economies without delaying much time.

These findings have implication towards potential investors of ASEAN+3 stock markets. Both risk-averse and risk-taking investors participate in the regional stock markets. The stock markets are significantly cooperative in the short-run

especially in the high income economies and some of the low income economies in which stock markets are efficient in responding to the market information, market shocks and market transparency. The stock markets are ready to diversify the country-specific risk as they are cooperative due to capital market openness. Therefore, the risk-averse investors can enjoy the stock returns without much concern especially in the short-run as the cooperative markets reduce the investment risks of investors. Conversely, the risk taking investors can maximize their investment returns by diversifying their portfolio investment amongst those non-integrated economies. The risk-taking investors can appreciate the higher returns in ASEAN+3 stock markets as a compensation of higher market risk, especially in the low income economies.

This study suggests the policy makers of ASEAN+3 economies to be watchful on the regional stock markets. The capital markets have been mainly open in this region since the late 1980s, which was further enhanced after the financial cooperation agreement of ASEAN+3 in 1999. But unexpectedly, majority of the stock markets are not cooperative in long-run and amongst low income economies, and therefore the risk-averse investors have to be more mindful in investing in low income countries in the long-run. This study suggest the policy makers to focus on risk-averse investors rather than risk-taking investors, because the risk-averse investors require the regional stock markets to be tightly integrated, thus improving the efficiency, standards and transparency amongst the regional markets. This mechanism benefits both parties: the foreign investors to gain returns at a lower level of risk, while regional economies can improve their individual stock markets.

Finally, the policy makers can resolve the problem of non-integrity through the following mechanisms: first, the cooperation on intra-regional transactions is very low which has to be improved in order to increase the integrity in regional stock markets. If the market forces do not work, the policy makers have to impose the policy-enforcement to develop the intra-regional transactions such as intra-investment, intra-trades, etc. Secondly, each of the member economies has to sacrifice the individual interest for the sake of regional market development and need to arrive at a platform for a common interest of cooperation of the regional capital markets and not for individual political mileage. Finally, the high income economies have to come forward in order to develop the regional stock market cooperation and draw the attention of foreign investors towards ASEAN+3 economies.

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NOTIONAL DEFINED CONTRIBUTION ACCOUNTS: AN APPLICATION TO MOROCCO

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Abstract: *In order to deal with pension financial pressure, several countries have adopted notional defined contribution (NDC) system, which is a financial defined contribution system based on the Pay-As-You-Go (PAYG) principles. Investigating whether NDC could be an efficient solution for the pensions financial pressure in Morocco is a relevant question. In this paper we examine the potential financial results related to supposing a transition, in the CMR civilian regime, from PAYG system to NDC. We assume an immediate switching to NDC scheme in order to study the theoretical effects NDC can have on the actual system by using the model proposed by the French Council “Conseil d’Orientation des Retraites” (COR). Our results show that NDC could have financial benefices in the long-term, whereas it could not have in the short-term. Consequently, NDC seems to be not a relevant solution for the Moroccan pension system, so another solution should be investigated to improve the financial situation.*

Keywords: *notional defined contribution; social security reform; policy evaluation; CMR pension scheme; Morocco*

JEL Classification: *G23; H55; J26*

1. INTRODUCTION

The Moroccan social security system is based on a PAYG mode where contributions of today workers finance benefits of retired people for the same period. This funding method, compared to others, is characterised by several defects mainly the system lack of legibility. The retirement system in Morocco is composed by two compulsory retirement regimes for the public sector workers

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namely the Moroccan Pension Fund, CMR (*Caisse Marocaine des Retraites*), and the Collective Scheme for Retirement Allowances, RCAR (*Régime Collectif d'Allocation de Retraite*). Likewise for the private sector workers, there is the National Social Security Fund, CNSS (*Caisse Nationale de Sécurité Sociale*). Nowadays, the Moroccan pension system has reached maturity, in other words, the amount of collected contributions no longer manage to finance that of pensions. In this situation, in a PAYG pension scheme, the financial situation is corrected using the reserves. But it should be noted that the annual consumption of the reserves will exhaust them. Among the pension plans mentioned above, the CMR presented the most urgent financial situation the deal with (see *Cabinet Actuariat*, 2010; *Cour des Comptes*, 2013).

The social security system over the world based on a PAYG funding method depends essentially on the adherents' contributions to finance retired and survived benefits. When these systems mature or in other words when the number of beneficiates exceeds one of the contributors, the regimes need to be reformed. There are two main types of reforms specifically parametric ones and systemic ones. The first type is based on changing the system parameters such as the contribution rate and the retirement age while the second type depends on changing the system funding operation. Given the importance of the transfer charges to a new funding operation, the deficit retirement systems are unable to adopt a defined contribution model such as that adopted by Chile since early 1980s. This was the reason for what the Sued invented the NDC.

On one hand, an NDC scheme operates like a funded plan to the point that contributions of NDC plan members are managed via individual accounts. On the other hand, it keeps the management foundations of a PAYG principle as the current contributions of adherents finance benefits for retirees of the same period. In general, the NDC funding system is a financial defined contribution system based on the PAYG principles as the NDC system keeps the PAYG financing method while it adopts the funded, defined contribution systems award and indexation formulas. As explained by Börsch-Supan (2005), adopting NDC funding method don't change the basic PAYG mechanism in which contributors of a specific period finance retired ones of the same period and they do not create savings unless they reduce benefits which imply saving rates reductions.

As cited above, the NDC funding method was created by the Sued but before adopting it, the country has had a testing ground where she established the new regime. The country helped in 1996 and 1999 respectively Latvia and Poland to introduce the new system. Thereafter, Sweden introduced it in 1999 with a

transitional period of 20 years and Italy for new entrants since 1st January 1996. Lindeman *et al* (2006) explained the speed of transition and its causes which was different from one country to another. Sweden had the fastest transition, namely all cohorts of people are covered by the new system. While Italy had the longest one where cohorts born before 1960 stayed in the old system which means that pensions according to old regime in Italy will be paid until around 2030 or even later. In Sweden, the speed of the transition from the PAYG pension scheme to the NDC was possible due to the good database of individual records dating from 1960 that permits calculating notional accounts for cohorts born in 1938 and older. In addition, the only change in the new Sweden pension system was the benefit formula.

Holzmann (2017) mentioned that “the basic conceptual structure of any NDC scheme is the consistent link between the individual level of its design and the macroeconomic level. At individual level, an NDC scheme promises income smoothing and intra-generational equity as it creates a strong contribution–benefit link. At macro level, an NDC scheme promises intergenerational equity and financial sustainability while remaining unfunded”. Furthermore, NDC plan makes it possible to avoid the difficult transition from a distribution system to capitalization in spite of the fact that NDC mechanism adopts various capitalization qualities. In fact, NDC is a financing method that grants both collective solidarity and individual equity. More precisely, the solidarity is maintained between generations through the use of distribution whereas the individual equity is maintained by the fact that each adherent finds the equivalent of its own contributory effort.

So in general, the high costs of switching to a fully funding method and the success and positive results of implanting the NDC financing method in several European countries are encouraging reasons to establish a notional account pension plan. In addition, we should not forget the limited results of parametric reforms on improving the financial situation of pension plans which their results remain limited in time.

To our best knowledge, this paper is the first work to study the eventual theoretical effects of switching to a new pension plan based on NDC funding mode. For that, we will use the NDC equations presented by the COR (*Conseil D'orientation des Retraites*) (Des Retraites; 2010) on the population existing in 2014 on the CMR civilian pension regime. Our approach is based on studying and analysing the theoretical financial effects of switching to an NDC plan. This work can be taken into account as a basis for the development of appropriate reforms to the CMR civilian pension regime. It gives several and useful policy implications to

the researchers and policymakers and this work can be developed in future by studying different reforms combinations.

Following this introduction, the remainder of the article is presented in four sections. The next section gives a brief overview of the existing literature which studied the possibility of implementing NDC pension plan in several countries. This is followed by the empirical methodology used in the study. The main findings are presented and discussed. The final section summarizes the study conclusions.

2. LITERATURE REVIEW

To preserve PAYG pension funds from insolvency, two types of reforms *structure* can be distinguished: parametric reforms and transition to an actuarially fair system (Volkov; 2010). In Morocco, the government promulgated in 2015 a parametric reform to improve the pension fund financial sustainability. Nevertheless, it is shown very often in the literature that a parametric reform is just a temporal solution and the need is for structural reforms. The costs of switching to new funded pension fund make it impossible. This was the reason why Sweden invented a new pension fund structure which combined both funded and unfunded structures. Holzmann (2017) discussed the emergence of the idea about NDC, the experiences of countries that adopted this financial technique. Furthermore, he presented how NDC works and its main technical boundaries. Gronchi and Nistico (2008) compared the NDC financing mode properties with those of defined-benefit.

NDC experience has had great success due to its financial stability in the countries where it was implemented. According to Volkov (2010), this is explained by the fact that “a quasiactuarial system is characterized by greater financial stability than a nonactuarial one, since it has some features of a funded system (the amount of money in notional accounts depends on the citizens’ contributions, although the return on investments is zero, or even negative in real terms). Switching to a quasiactuarial system strengthens the connection between contributions and benefits and provides Pareto improvement thanks to smaller distortions of the labor market and a more balanced system.”

Börsch-Supan (2005) presented NDC taxonomy and clarified its pros and cons. In addition, he showed that properly designed NDC public pension systems contain powerful economic and political mechanisms that may facilitate pension reform. Knell (2018) explained that for implementing a financially stable NDC pension system in the presence of life expectancy, policymakers must arrange the notional interest rate, the adjustment rate and the annuity conversion factor in an appropriate way.

The World Bank has shown interest in the NDC reforms, so it has presented three books on this issue explaining the financing mode, the experience of countries that adopted the NDC model, and countries where it's question to adopt an NDC financing mode as a reform (Holzmann and Palmer, 2006; Holzmann *et al*, 2012a, b).

The experience success in different countries where it was implemented pushed the researchers to study the possibility of adopting the same financing mode. In Europe, for example, Palmer (2002) argues that adopting an NDC financing mode would made the exit from the workforce more flexible and would remove obstacles to labor mobility in Europe. Moreover, Honekamp (2007) compared pension fund stability dealing with an ageing population in two countries, namely Sweden and Germany.

The rate of population aging is increasing in the developing world and the trend is particularly dramatic in East Asia. It is the principle reason for what some papers studied the possibility of implementing NDC retirement pension, such in Japan (e.g. Lu *et al*, 2008; Takayama, 2006) or in China (e.g. Oksanen, 2012). Some papers compared the effect of implementing NDC on different countries, such as Williamson *et al* (2012) who studied the potential value of the notional defined contribution model in two countries from east Asia (China and Singapore) and one from south Asia (South Korea).

NDC financing mode has sparked interest not only in Europe or Asia but also in the US. Min and Seo (2012) proposed an NDC reform due to the population and financial sustainability. Boskin *et al* (1988) made a NDC reform proposal to the US Social Security for Old Age, Disability and Survivors.

Despite his notoriety, the lack of redistribution mechanisms in NDC systems is still discussed. Ventura-Marco and Vidal-Melia (2016) developed a theoretical basis for integrating retirement and permanent disability using a generic nonfinancial defined contribution framework. Furthermore, Halvorsen and Pedersen (2019), study the distributional effects of the reformed Norwegian pension system, which is based on NDC financing mode, with a particular focus on gender equality.

3. THE NDC STRUCTURE

As indicated by his name, an NDC plan is a defined contributions regime which works like a PAYG one due to the fact that contributions collected from actual contributors serve to finance pensions to the retirees of the same period. The difference between NDC and PAYG lies not only in the level of contributions but

also in benefits. These are a function of several parameters in a PAYG plan while it is a function of contributions collected during the working life of the contributor. These contributions represent the individual savings of contributors collected into individual accounts called notional accounts as is the case in a plan managed by capitalization or by points. But these accounts are not real savings assets, indeed, they are intermediaries of calculations. This is what is called virtual accounts in the case of NDC plans because the balance is fictional (or “notional”) since no real capital is accumulated.

Each year, this account is revalued based on an indexation to inflation (like in Suede) or wage trends (like in both Poland and Latvia), or GDP (like in Italy) (Des Retraites; 2010). As in capitalisation, when the adherent enters retirement, his virtual account is converted into annual pensions through actuarial coefficients (named conversion coefficients) that take into account life expectancy. In fact, they are calculated according to the retirement age and not to the contribution period which is the case in PAYG plans. More precisely, the conversion coefficient is calculated for each generation. Thereby, for a given generation, the payment of this pension over the entire expected retirement period exhausts at the end of life the virtual capital still indexed. In fact, the virtual capital is divided by the number of years remaining to live.

The NDC funding model represents four several advantages compared to PAYG financing model, namely, a better recognition of modest wage careers and a best consideration of the inequality of life expectancies. Furthermore, this financing mode separates income replacement from redistributive considerations and finally it is a good way for politicians. These advantages are presented above.

In the actual pension system the calculation of the retirement pension is based on a reference salary which is actually the average of the last eight wages in the CMR pension regime. This method of calculation advantages staffs with a strong salary increase during their careers, especially at the end of the period (Bozio and Piketty; 2008), contrariwise, it disadvantages employees with low salaries. With the introduction of NDC plan, the pension becomes the result of individual savings during the working life period so even the lowest salaries of the career are integrated in the pension calculation. In fact, each employee has a fictitious personal account which enables him to a retirement pension. The latter is proportional to the contributions collected during his working life, knowing that any contribution paid gives additional rights, and not even an extension of the old salary. According to the COR simulations, a notional system would conduct, all things being equal, to a redistribution of the highest pensions to the lowest pensions.

Moreover, benefits in NDC plan are indexed to longevity due to the annuitization mechanism and to employment through a correctly computed notional rate of interest. This leads an NDC system to be automatically adjusting to changes in both life expectancy and macroeconomic environment (Börsch-Supan; 2005).

Furthermore, an NDC scheme is designed without redistribution mechanisms which is an important aspect for transparency but may introduce redistributive measures. However, redistributive interventions have to be clearly introduced into the scheme (Holzmann; 2017). In fact, the introduction of NDC mechanism should be accompanied by the establishment of additional devices to recreate non-contributory benefits.

And finally, the NDC system makes people think in accounts because any contribution paid gives additional rights, and it's a good way for politicians (Cichon; 1999) as it makes the transition to partial funding psychologically easier (Börsch-Supan; 2005).

4. MATERIALS AND METHODS

In PAYG managed systems, the retirement pension is determined in terms of the wage (the last one or an average of working years). While in NDC managed system, the retirement pension is based on an actuarial equivalence between contributions collected during working life and benefits will be versed in retirement period. This calculation is done individual by individual by the fact that each adherent has an individual account functioning as saving account where the contributions versed during his working life are collected. This is a virtual account which is an intermediate calculation tool used to compute the retirement pension. To study the theoretical effects of implementing NDC financing mode in Morocco, we will use the model clarified by the COR (Des Retraites; 2010).

Each adherent to the system accumulates during his working life a virtual capital C which is the discounted sum of the collected contributions and is expressed as follows:

$$C = \sum_{x=x_1}^{x_r-1} \tau^{cn} .S_i(x).(1+r^{obs})^{x_r-x}, \quad (1)$$

Where, x_1 is the recruitment age, x_r is the retirement age, τ^{cn} is the contribution rate, S_i is the salary of the individual i at age x and r^{obs} is the virtual capital revaluation rate.

More specifically, the initial retirement pension is actuarially calculated as a lifelong annuity. The initial pension under notional accounts is calculated by making the sum of contributions paid during working life equal to the sum of pensions that the retiree receives until death. In fact, the actualized amount of pension flows must be equal to the accumulated virtual capital.

$$\sum_{x=x_r}^{\omega} \frac{P_i(x_r) \cdot (1+g)^{x-x_r}}{(1+r^{proj})^{x-x_r}} \times p(x_r; x) = C, \quad (2)$$

Where r^{proj} is the expected rate of return of the virtual capital, g is the rate of pension revaluation, $p(x_r; x)$ is the probability of survival between age x_r and age x , and ω represents the age of death.

We put:

$$\frac{1}{1+a} = \frac{1+g}{1+r^{proj}}, \quad (3)$$

The equation (2) can be written as follows:

$$P_i(x_r) \cdot \sum_{x=x_r}^{\omega} \frac{p(x_r, x)}{(1+a)^{x-x_r}} = C, \quad (4)$$

The conversion coefficient therefore verifies the following relationship:

$$\frac{1}{G} = \sum_{x=x_r}^{\omega} \frac{(1+g)^{x-x_r}}{(1+r^{proj})^{x-x_r}} \times p(x_r; x) = \sum_{x=x_r}^{\omega} \frac{p(x_r, x)}{(1+a)^{x-x_r}}, \quad (5)$$

where G is the conversion coefficient and a is defined as the actualization rate on which depends the conversion coefficient.

Hence, the retirement pension P at the liquidation date is equal to the virtual capital C accumulated on the retirement liquidation date, multiplied by the conversion coefficient G . It is calculated as follows:

$$P_i(x_r) = G.C, \quad (6)$$

NDC financing model takes into account the risk of longevity in calculating the pension through the conversion coefficient. The latter depends particularly on the survival probability at the retirement age which tends to evolve generation after generation.

Particularly, if the revaluation rate g is equal to r^{proj} , then a is equal to zero and the conversion coefficient is equal to the inverse of the life expectancy. Namely, the latter at age x_r is the sum of the probabilities of survival at each age.

The projection assumptions

We suppose in this paper an immediate transition from PAYG to NDC funding mode so as to study and observe immediately the consequences of setting up an NDC plan (Blanchet; 2009). This scenario is not realistic, but it allows us to observe the immediate consequences of adopting NDC financed plan. Our projections are based on the population existing in 2014 on the CMR civilian regime. We base our simulations on the hypotheses presented in Table 1, where are presented the projection variables and their hypothetical values.

Table 1. Projection assumptions

Variable	Hypothetical value
Contribution rate	20%
Rate of virtual capital revaluation*	4.6%
Salary evolution rate	4.5%
Pension revaluation rate	1%
Discount rate	4%

* we choose it to be equal to the average growth rate for the last five years (same parameter chosen in Sweden. As a result, we will take a fixed annual virtual interest rate).

5. RESULTS AND DISCUSSION

In this paper, we projected the financial situation evolution of the CMR's civilian pension regime, based on the assumptions mentioned above (See Table 1) during the period 2014-2064. The simulations show the theoretical effects on switching to NDC financing mode.

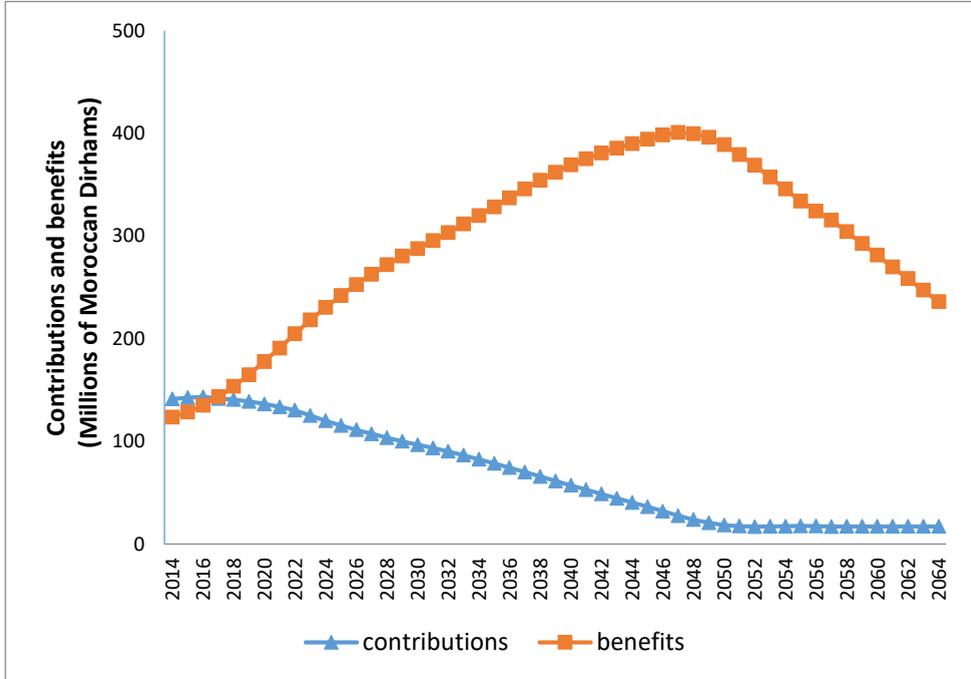


Figure 1: Projection of the CMR's civilian regime contributions and benefits under NDC funding mode (millions of Moroccan Dirhams)

As shown in Figure 1, adopting NDC financing mode will impact the amount of contributions collected by the pension scheme and in the same time the total benefits paid to retirees. During all the projection period, the population is a relatively stable. This stability is must be due to the recruitment politic in the public sector, where the number of new employees replaces that of retired, disables and deceased ones. In additions, the decrease in the number of workers contributing to the system is must be due also to the lack of employment in the formal sector. Accordingly, in the end of projection, the contributions value will be fix start of 2050.

The amount of benefits stills so important compared to that of contributions. It must be due to the important number of retirees existing in the scheme compared to that of contributors. It could be also explained by the fact that NDC financing mode takes in consideration the total wages earned during working life.

As presented in Figure 1, the sum of contributions collected by the plan exceeds that of benefits paid by it at the beginning of the period because the plan is surplus. However, it would decrease and be nil in 2017, which reflect the theoretical functioning of the notional account regime with a relatively stable population.

Benefices of adopting the NDC funding mode will be perceived start of 2050, when the amount of benefits will start to decrease. This is explained by the one advantage of NDC model comparing to PAYG financing mode is that it will, at least in the long run, help keep pension benefits in balance with the available contributions (Williamson and Shen, 2004)

The results are owing to the contributions and benefits indexation (Lindeman *et al*; 2006). The results can be improved by adopting another indexation mode. Furthermore, the NDC financing mode encourages working longer as benefit entitlements rise with a longer working period. Lu *et al* (2008) explained that defined benefit pension systems tends to cap or reduce increases in benefits after a certain stipulated contribution period, but it is frequently claimed that an NDC scheme, contrariwise, encourages people to work longer.

The reserve fund in the PAYG systems is used to manage unexpected fluctuations in the covered payroll. If the reserve fund is well invested, it will guarantee a rate of return that exceeds the PAYG return, this alleviating the decline in the PAYG return. Lindeman *et al* (2006) explained that there are two reasons to establish larger buffer funds “One reason is to smooth out known variations in demographics—for example, a baby boom, followed by a baby bust, followed by replacement fertility rates. The other reason is to manage unknown long-term demographic trends, such as a move from one birth rate pattern to another (for example, two plus to two minus children per woman). Such long-term trends can be mitigated by buffer funds”. In

this paper, we study the theoretical impact of adopting an NDC financing mode on the amount of the reserves (Figure 2).

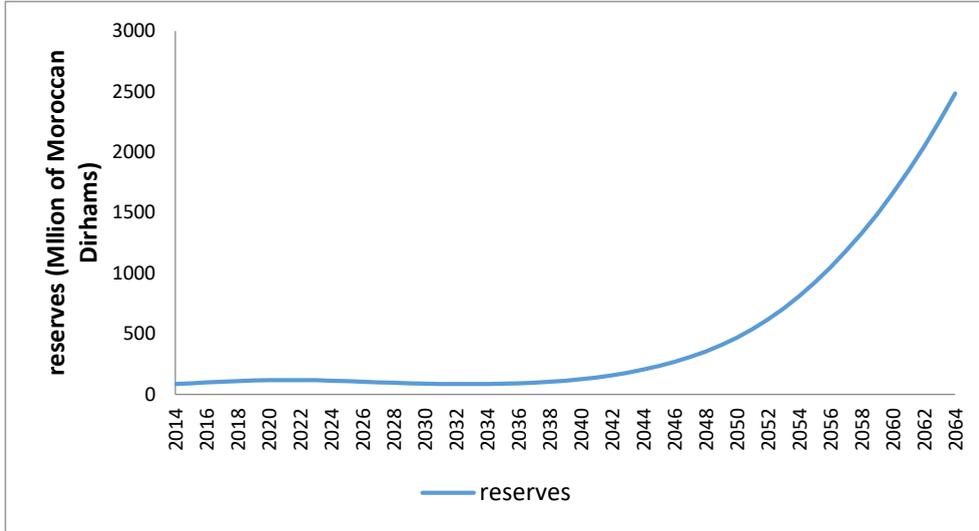


Figure 2. The CMR reserve projection under NDC funding mode (millions of Moroccan Dirhams)

Even so the amount of benefits is such important compared to that of contributions during the projection period that will not impact the reserves. The latter will still positive and is relatively stable during the period 2014-2040 but will know an exponential increase by the end of the projection period. This must be due to the fact that the pension scheme adopting NDC funding mode paid only one type of benefits namely retirement ones which are the result of individual saving. In addition, an NDC pension scheme delivers lower pensions than those delivered by PAYG pension scheme.

An NDC financing mode is transparent towards the system members. In fact, they can consult the amount of their contributions at any moment during their working life and their benefits are the direct result of the sum of their contributions. This transparency provides an incentive to stay in the labor force longer (Gray & Weig, 1999) which can have impact and improve results in Figure 1.

We should note that NDC does not offer a solution for countries facing an important disequilibrium in the short term (Valdés-Prieto, 2000). This is an important consideration because most of the countries that adopted NDC financing mode, did so at a time of short-term fiscal crisis, when their pre-existing annuity regimes were very unbalanced. The introduction of the NDC scheme was generally accompanied with a couple of contribution increases and benefit reductions. In

some cases the inflation was a cause that reduced the amount of benefits promised under the prior PAYG system. This combination of reforms is part of the solution, especially in the transition economies despite that it has sometimes been a partial flaw on previous promises. In general, over the long-term which is a period of several decades, the NDC model help to keep a pension system in balance, but in the short-term and particularly the first few years this funding mode will by itself be of little if any help.

It would be hard to get popular support for a radical change in the system as Volkov (2010) explained that there is no transparency or clear correspondence between contributions and benefits. Contrariwise, it may be that people are more willing to accept it especially when it is clear that the current benefit structure is not sustainable or because they prefer the new scheme structure and the control it gives them over their eventual pension benefit.

Despite its important advantages, the NDC financing mode can be refused by people due to its limits. In this plan, an adherent must pay an additional contribution to get access to the non-contributory benefits. Contrariwise to the PAYG plan which is characterised by solidarity, the NDC one works like a funded plan for this type of benefits. In fact, the NDC plan is characterised by the reduction of solidarity because each plan member receives a retirement pension based on the sum of contributions made during his working life. In addition, Börsch-Supan (2005) mentioned that NDC systems are well positioned to manage the challenge of longevity. More precisely, they react to slow changes-in fertility through the internal rate of return, but not to sudden changes in fertility.

6. CONCLUSION

In Morocco, the financial problem of pension schemes is not about demographic ageing but it is specially a demographic problem within the pension scheme as the total number of retirees exceeds that of contributors. The contrast number of contributors and retirees may be due directly to two causes. The first is the recruitment politic in the public sector, as the number of new employees replaces that of retired, disabled and deceased ones and the second is the lack of formal sector jobs. To improve the financial situation, policymakers in Morocco should deal with these causes.

In 2015, the government adopted a parametric reform intended to deal with the critical financial situation of the CMR civilian regime. Accordingly, this parametric reform pushes adherents to pay higher contributions for lower benefits. Moreover, the poorly written rules in the elaboration of the retirement pension

scheme that was created in the colonization period, are not actualized since then. During the existence of the CMR civilian regime, a sole reform has been adopted to increase the contribution rate from 14% to 20%. However, the pension scheme doesn't take into consideration changes at the level of population (life expectancy, etc.) and economic policies (employment, etc.). For this reason, this study investigates the possibility of establishing a new financing mode, namely the NDC mode, that several developed and developing countries has already adopted to solve pension financial pressure. In this context, we examined the theoretical effects that the actual system can undergo in case of an immediate switching to NDC scheme. For that, we use the model proposed by the "*Conseil d'Orientation des Retraites*" (COR).

The NDC system has several advantages as it allows a better recognition of modest wage careers, a best consideration of the inequality of life expectancies, and separating income replacement from redistributive considerations. Nevertheless, the NDC financing mode has a number of considerable disadvantages. We quote mainly, the important ones. First, the level of pensions will be lower under the NDC financing mode than PAYG. Second, the annuity system has so far ensured a "standard of living between retirees and assets", which would not necessarily be the case for another system. Third, the NDC plan is characterised by the reduction of solidarity because each plan member receives a retirement pension based on the sum of contributions made during his working life. Fourth, it is a system deprived of all his contributory advantages and adherents must pay an additional contribution to get access to the non-contributory benefit.

Our results show that NDC is beneficial in the long term, whereas in the short term it is not. Nevertheless, the Moroccan pension scheme needs solution in the short term. Consequently, it would be preferred to preserve the existing pension system than transitioning to NDC system.

However, the current system is still unsatisfactory and a more relevant solution should be investigated to improve the financial situation. As a suggestion, some recruitment policies could be set to increase the number of employees, and make formal the informal sector. Furthermore, some positive NDC characteristics can be added to the implemented PAYG regime to then obtain a more performant system.

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INTERTWINED WORLD: ECONOMIC NETWORKS, POSITIONALITY AND GROWTH

TENZIN TAMANG*, HOAN PHUNG TIEN**

Abstract: *Deepening globalisation and the unrestricted flow of resources across domestic borders has led to the emergence of an intertwined world, which has replaced the influence of local to global forces on places. In this situation, there has been an advent of a network paradigm, as understanding how nations are placed within these networks has become critical in 'globalizing' policies. Although literature posits that the fate of places has become increasingly reliant to their position in networks shaped by the international flows of investment and trade, this is more often asserted than demonstrated, as little studies probes on whether positionality of nations in a network directly converts to improved economic performance. Drawing upon data on Foreign Direct Investments (FDI) from financial times, in this paper we test the relationship between network positionality in different scales of integration and economic performance between 2003 and 2016 for the Southeast Asian countries.*

Keywords: *Globalization, Networks, Positionality, Economic growth, Foreign Direct Investment (FDI), Southeast Asia.*

JEL Classification: *D85, F21, F63*

1. INTRODUCTION

Deepening globalisation and the unrestricted flow of resources in the form of capital, goods and services across domestic borders has led to the emergence of an intertwined or a networked world, which has replaced the influence of local to global forces on places (Clark et al. 2002). Hence, places today are like any other complex structures which are increasingly reliant on interdependencies, realised through complex linkages (Schweitzer et al. 2009). It is argued by scholars that in this scenario 'networks' has grown into foundational units of analysis to better understand

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the global economy, rather than firms and places (Dicken et al. 2001); calling for a fresh methodology to go beyond the limits of established knowledge and theories on the driving forces of development. In this situation, there has been an advent of a network paradigm and the use of various network exploration tools to understand the role of cities/nations as actors within networks shaped by the inter-country flow of various resources, as understanding how nations are placed within these networks has become critical in 'globalizing' policies (Clark et al. 2013).

The initial concept of network economies were perceived as early as the 20th century when the internationalization of economies bloomed. Studies like 'Cities as Systems within Systems' by (Berry 1964) were grounded in the concept that cities encompassed both internal and external relations. Further, (Hall 1966) in his book, 'World Cities', posit the need to take account of the external relationship of cities to understand how they develop. However, the initial concepts were relatively simple and hierarchical (Taylor 2004). The current strands of studies on networks between economies were provided with a starting point by the World City Hypothesis by (Friedmann 1986). His work provided the early concept of the spatial organization of the new international division of labour. He argued that certain cities would take a central position in the organization of markets and capital, while their subsidiaries would arrange into a system forming a global hierarchy. These cities would control international finance also acting as a key destination for both investments and human capital (Friedmann 1986). Since then several strands of literature by eminent scholars like (Camagni and Salone 1993, Sassen 1994, Castells 1996) have theorized the concept of networks. However, the first thorough empirical analysis on networks between cities was demonstrated by (Taylor 2004) in his book *World City Network*, which emphasized on the emergence of new networks formed by major financial and business service firms and their global clients.

Building on this, a body of related empirical research on places has emerged investigating various networks. Some of this includes studies on global infrastructure networks such as airline passenger networks (Smith and Timberlake 2001), corporate networks formed by multinational headquarters and their subsidiaries (Alderson and Beckfield 2004, Wall 2009) and economic linkages through the Australia-based corporate network (Sigler and Martinus 2017). This brief overview of networks between economies was aimed to reveal the conception of networks over time. Broadly, the core of all this studies efforts to explain how technological advances have led to the reduction of local barriers expanding activities and interactions beyond national boundaries in the global space, forming

physically unseen yet existing networks. Hence, in this scenario, the traditional paradigm of territories is replaced by networks.

1.1. Originality/Value

There is a considerable amount of research on cities/nations adopting a network approach, but mostly, they are focused on defining their role within diverse networks differentiated by functionality and are commonly discussed at a global scale, failing to consider that places are embedded in a range of geographical scales, from local to global as emphasized by (Sheppard 2002). Relatively, limited research has explored it across networks of different scale. Furthermore, the positionality of nations within a network is said to determine their power and prestige in the global system, but there is limited empirical evidence on whether it directly converts to improved economic performance (Pain et al. 2016), and if the positionality at different network scales has differential impacts on their performance.

Building upon existing research which is primarily based on the World City Network (WCN) research that has significantly theorized on the dynamics of global economic connectivity, this paper extends the limits of existing research: first, by adding a scalar perspective to positionality as equally important. The term 'positionality' herein describes how different nations are positioned concerning one another in a network. It is theorized as both moulding and moulded by the courses of globalization and as driving the growth of places in a globalizing world (Sheppard 2002). To our knowledge, only (Wall 2009) has explicitly assessed the scalar differences of positionality in intercity corporate networks covering corporate networks across the globe, corporate networks of Europe with their worldwide subsidiaries and corporate networks of The Netherlands with their worldwide partners.

Second, this study contributes to the literature by assessing the correlation between a nation's positionality in different network scale and their economic performance. This allows combining network data with attribute data of each country, as emphasized by studies like (Alderson and Beckfield 2004, Carroll 2007) on the need to account both network data and attribute data to make network research more significant to development studies. To our knowledge, only (Pain et al. 2016) has assessed the relationship between city network connectivity and economic performance. Using corporate connectivity in advanced producer services, air and maritime connectivity of US and European cities as network measures, they attempt to disentangle whether the position of cities in the network correlates to economic growth (GDP). Other closely related research on the topic

has been conducted by (Wall 2009) evaluating the strength of corporate connectivity with the competitiveness of nations.

In analysing positionality and its association with economic growth, a scalar approach is important because with the division of large production units into multiple subsidiaries across different geographical scales (Dicken 2004) the spatial reach of nations has advanced and they tend to occupy diverse positions in different network scales (van der Knaap 2006). Further, various geographical scales may influence a city's competitiveness (Asheim and Isaksen, 2002) or may even simultaneously influence them (Malmberg and Maskell, 2002). Understanding of places and their development as a consequence of multiple relational assets and resources (Amin and Graham 1999) and considering the multi-scalar forces that influence regional development and not favouring one specific spatial scale (Coe et al. 2004) may allow policymakers to frame correct or strategic interventions based on their priority or interest. Also, contemporary economic development studies have been bedevilled by analytical disjunctions, ensuing abstractions at either macro or meso levels or where empirical analysis have queried micro-level processes (Henderson et al. 2002).

The networks explored in this study concern the Foreign Direct Investment (FDI) linkages considering literature posit that the performance of nations/cities have been increasingly dependent on the position they occupy in networks shaped by international investments and trade (Alderson and Beckfield 2004). Further, FDI also is a significant attribute of the globalization era, observed as the movement of capital between countries, mostly from industrialised to developing countries (Hofmann 2013). By the year 2000, 40% of investments to developing countries were in the form of FDI and from the year 1990 to 2011, FDI in the world's total GDP increased from 8% to 29% (Schwab 2014) highlighting the growing significance of FDI in the global economy.

As the networks explored in this study concerns FDI linkages, third, this study may also complement the discussion on the FDI and economic growth nexus. Although there is a plethora of work on foreign investment and economic growth, this tends to largely rely on traditional non-relational data as a proxy indicator for economic integration for its empirical bases. Little of it probes the network dimension of these investments and its impact on the economies, and even less of it deals with the significance of multi-scalar investment networks for economic development.

Unlike previous research which is skewed in their geographical focus with most extant studies focused on developed regions or is discussed globally, this

paper provides empirical evidence from the ASEAN (Association of Southeast Asian Nations) region which has received little scholarly attention on this subject. The region also provides a fertile ground of research for this study because of its socio-economic conditions and associated policy challenges. The region experiences a highly uneven distribution of investment flows among nations of different economic levels.

Though most of the extant network studies are based on intercity linkages, this study is not executed at the city level because FDI data and most economic performance indicators at the city level for this region are not readily available. A national-level analysis is, however, justifiable considering that amid globalisation, cities have become the epicentre of the global economy and the role of nations may have declined but this does not mean they have become insignificant to the world economy (Taylor 2004).

First, this paper applies social network analysis to study the positionality of ASEAN countries at different scales of integration to generate multi-scalar network patterns and to analyze and compare them for deeper insights. The geographical scales explored in this study concerns: first, the FDI linkages between ASEAN and countries world-wide (global). The second concerns linkages between ASEAN and Asian countries (regional) and third includes the intra-ASEAN linkages (local). Three common network measures of centrality have been used to study the positionality. Second, three regressions for the global, regional and local scale is conducted to identify if their respective positionalities share a significant correlation with the economic performance. Five different measures of centrality are included in the regression to derive a refined understanding of the association between positionality and economic growth.

The next section provides the methodology. In section three, the empirical results are discussed, followed by a discussion in four and the conclusions in section five.

2. METHODOLOGY

The data used in the analyses concern bi-lateral Greenfield FDI linkages of the ten ASEAN countries compiled from Financial Times, fDI markets. FDI is primarily composed of 'Greenfield investments' and 'mergers and acquisition (M&A)'. The interest of this study, however, is Greenfield FDI as it represents investments from multinationals to new subsidiaries and tends to directly support capital formation, transfers new technology, boosts innovation, productivity and employment (Shi et al. 2019). This provides a noticeable link between investment

flows and a nation's economic performance. The compiled FDI data is for the period 2003 to 2016.

To investigate the positionality of ASEAN nations in their global, regional and local investment networks, social network analysis is applied which has become increasingly popular in city network studies (Alderson and Beckfield 2004, Derudder and Taylor 2005, Toly et al. 2012, Hennemann and Derudder 2014). While there are many tools to execute network analysis, this study applied Gephi network mapping to generate weighted network structures of the ASEAN investment linkages. In generating the maps, aggregate FDI data for the period is used. The representation of the countries in the figures is done with country codes. Table 1 below provides the list of countries included in the analysis with country codes.

Table 1: List of Countries and Codes

No.	Country	Country Code
1	Brunei Darussalam	BRN
2	Cambodia	KHM
3	Indonesia	IDN
4	Lao PDR	LAO
5	Malaysia	MYS
6	Myanmar	MMR
7	Philippines	PHL
8	Singapore	SGP
9	Thailand	THA
10	Vietnam	VNM

Source: Authors, 2020

2.1. Network Measures of Centrality/Positionality

In the first part of the study, the positionality is analysed based on the total FDI flows occurred in the period. Three common network measures of centrality have been used to study the positionality of ASEAN countries in their global, regional and local investment network, namely indegree, outdegree, and betweenness. Fundamental to these measures is the notion that the positionality of the actors (nations) in the network is determined by the interaction between actors. In simpler terms, indegree refers to the number of incoming ties and outdegree signifies the number of outgoing ties from an actor. In city network literature, indegree is generally referred as an indication of prestige or dependency of a city on others and outdegree provides a measure of the economic power of city on others (Alderson and Beckfield 2004). Indegree and outdegree formula are as follows:

$$C_I(n_i) = \frac{x+i}{g-1} \quad C_O(n_i) = \frac{xi+}{g-1} \quad (1)$$

In the formula (1), the indegree CI of country n_i is the number of links received by country i , is represented by $X+i$. Similarly, $g - 1$ represents the maximum number of ties linking i to j . The outdegree CO of country n_i is where $Xi +$ represents the number of ties sent from country i , and $g - 1$ is the maximum number of possible ties linking i to j (Wasserman and Faust 1994).

The third centrality measure explored in the study is the betweenness centrality which indicates the strength of the brokering role of actors in a network (Borgatti 2005). Places that are located in the connecting paths of other cities in the network are deemed to have a higher betweenness and will have the advantage of being brokers who control the flow of information, capital and trading activities in a network or even act as a 'bridge' to sub-networks (Neal 2013).

Betweenness formula:

$$C_B(n_i) = \frac{\sum_{j < k} \frac{g_{jk}(ni)}{g_{jk}}}{(g-1)(g-2)/2} \quad (2)$$

The formula (2) shows how to calculate the betweenness CB of each country n_i where $g_{jk}(ni)/g_{jk}$ represents the probability that the geodesic g linking countries j and k include country i . To standardize this it can be written as $(g - 1) (g - 2)/2$ to guarantee that $C_B(n_i)$ will be between 0 and 1 (Wasserman and Faust 1994).

For the second part of the analysis, three separate regressions were conducted to assess the correlation between the positionality of ASEAN countries in the investment network and their economic growth. In addition to the degree and betweenness centralities, two additional measures of centrality: closeness and eigenvector, were included in the regression as the independent variable. Unlike the study by (Pain et al. 2016) which uses the number of ties as a general indicator of network connectivity, this study takes account of five network measures of centrality in the regression to assess the relationship based on the different positionality of nations in the network. This is comparable to (Wall 2009) which included two measures of centrality (indegree and outdegree) and total connectivity as a measure of network strength for assessing the connectivity and competitiveness relationship.

Closeness centrality indicates the network proximity to near and distant nodes of the network and those with higher closeness scores tend to be at an informational advantage (Neal 2011). The idea of the eigenvector centrality is based on the notion that a node will be more central or prestigious if it shares a relationship with nodes that are highly central or prestigious, so the centrality of a

node not only depend on the number of its connection with other nodes but also the weight or value of the associated nodes. Thus, this approach is ideally suitable for analysing the influence of a node within the network (Ruhnau 2000). Mathematical representation of closeness centrality is as follows:

Closeness centrality:

$$C(ni) = \frac{1}{\sum_y d(y,x)} \times n \quad (3)$$

The formula (3) shows how to calculate the closeness C of each country ni . It is calculated as the reciprocal of the sum of the length of the shortest path between the country and all other countries in the network as denoted by $\sum_y d(y, x)$ where $d(y, x)$ is the distance between vertices formed by ties x and y . In a normalized form, the formula is multiplied by N where n is the number of nodes (actors) in the network.

In a network graph, if a country i is connected to j , the eigenvector centrality score of country i can be calculated as follows, where $M(i)$ is the set of neighbours of country i and λ is a constant.

Eigenvector:

$$C_i = \frac{1}{\lambda} \sum_{j \in M(i)} x_j \quad (4)$$

2.2. Empirical Model

The Gross Domestic Product (GDP) data of the ASEAN countries for the period were compiled from the World Bank database and is used as the dependent variable in all three regressions. Since positionality is not the only factor that may impact the economic performance of a country, a set of indicators of human capital, institutional setting, infrastructural development, demography and market condition is included in the model as control variables.

Many studies have pointed human capital as one of the key factors that determine the economic performance of a country. It not only influences national production through labour productivity (Borensztein et al. 1998) but also facilitates the transfer of technology, new practices, and skills (Nguyen et al. 2009) fostering innovation. Availability of skilled and qualified human capital is also said to determine the competitive advantage of nations influencing the rate of foreign investments (Blomstrom and Kokko 2001). Hence, the analysis included two indicators of human capital in the regression analyses, namely education and employment rate as a measure of skills and workforce respectively.

The institutional setting in the form of policies, coordination system or governance structure is also argued to be pivotal for achieving economic growth and improving the competitiveness of a country. Whitley (1998) posit that the nature of markets and behaviour of firms in a business system vary across geographical locations because of the differences in institutional settings that moderates the financial and labour markets (Whitley 1998). Also, Kitson (2004) consider institutional settings as social capital and a local asset that makes a region more competitive and provides common commitment which is favourable for firms and businesses (Kitson et al. 2004). Therefore, this analysis incorporated an indicator of corruption control as an indicator of the institutional setting.

Further, an indicator of liner shipping connectivity is included in the model as a measure of infrastructural development because studies have also claimed that the level of development of a country in terms of physical infrastructure closely links to their performance. Infrastructure like electricity, roads, and information technology improves the productivity of the local firms by reduction of cost (Le Blanc et al. 2016). Also, studies have found that the quality of physical infrastructure supports the human capital of a country and contributes to the pursuit of socially inclusive growth. It improves the productivity of the people by creating equal access to services like education and health that improve their abilities to pursue opportunities (Ali and Pernia 2003). Last, indicators of population density and inflation are also included in the model as a control for demographic size and market condition respectively. Table 2 below provides the details of variables, indicators included in the regression model and the data sources.

Table 2: Variables and indicators

Variable	Indicator	Source
Economic growth	GDP per capita	World Bank
Network centrality	In-degree	Generated using network analysis
	Out-degree	
	Betweenness	
	Closeness	
	Eigenvector	
FDI	FDI value	FDI Market
Education	Educational level (% enrolment in tertiary education)	World Bank
Labour	Employment to population ratio	World Bank

Variable	Indicator	Source
Governance	Control of corruption	World Bank
Infrastructure	Liner shipping connectivity	World Bank
Population density	Population density	World Bank
Inflation	Inflation rate	World Bank

Source: Authors, 2020

Before running the analysis, it was ensured that the model met the assumptions and following a Hausman test, the analysis adopted a fixed-effect model.

$$Y_{it} = \beta_1 X_{it} + \alpha_i + \epsilon_{it} \quad (5)$$

In formula (5): Y_{it} is the dependent variable with $i = \text{entity}$, $t = \text{time}$; X_{it} is the independent variables; β_1 is the coefficient of the independent variable; α_i is the intercept for each country; ϵ_{it} is the error term.

3. RESULTS

3.1. Positionality

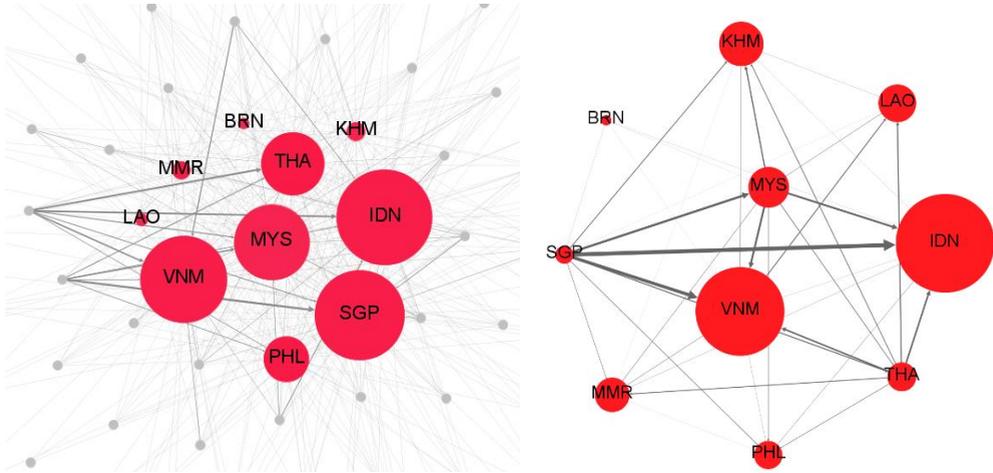
To recapitulate, the first part of this research concerns positionality of the ASEAN countries in the investment networks that link them to other countries and to compare the networks at different scales (global, regional and local). For this inquiry, the indegree, outdegree and betweenness centrality techniques are applied and network maps have been generated to assess the positionality of ASEAN countries in the network of investment flows through visual and topological representation. The ASEAN countries are represented as nodes (with country codes) connected through FDI linkages in the following Figures one, two and three below. The size of the dot representing each country is weighted and is proportional to the indegree, outdegree and betweenness of the countries (nodes).

In the results (Figure one), Indonesia is the dominant nation in terms of global indegree, followed by Singapore, Vietnam and Malaysia. Laos, Cambodia, Myanmar and Brunei are the least attractive destination for global investors in the ASEAN exhibiting trivial global indegree. Also, at a regional scale, Indonesia prevails as the leading nation in terms of indegree showing that it is the most attractive destination for Asian investors, followed by Vietnam. A visible difference between the global and regional indegree network is the dipping positionality of Singapore on the regional scale compared to global. On the other hand, Vietnam and Indonesia

maintain a strong indegree even in the regional network. In the local indegree network, similar to their positions in the regional network, Indonesia is the leading nation followed by Vietnam. The indegree position of Singapore is found to be further reduced in the local network and is only comparable to Brunei, which has the least indegree in all scales of the network.

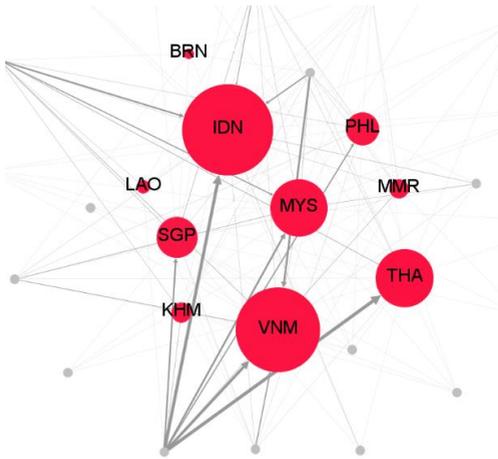
In the results (Figure two), the network-based on outdegree of the ASEAN countries in all the scales show a similar pattern, with Singapore as the standout nation. All the remaining nine ASEAN countries share insignificant outdegree compared to Singapore. However, following Singapore, Malaysia and Thailand tend to have relatively stronger outdegree centrality than other countries, in all the scales. In the results (Figure three), Singapore is the top nation in terms of betweenness, in the global and regional investment network. However, Vietnam holds the leading brokerage position in the intra-investment network despite its nominal position in the global and regional network, followed by Singapore. Countries like Thailand also hold a dominant betweenness position in all the networks, only second to Singapore in the global and regional network; and occupying the third position in the local network.

Figure 1: Weighted indegree Centrality of the ASEAN countries (2003 – 2016)



Global

Local



Regional

Figure legend

The circles with codes represent the ASEAN countries connected by FDI flows. The size of the circle is weighted and is proportional to the indegree of the countries (nodes).

Country Codes: Brunei Darussalam-BRN; Cambodia-KHM; Indonesia-IDN; Lao PDR-LAO; Malaysia-MYS; Myanmar-MMR; Philippines-PHL; Singapore-SGP; Thailand-THA; Vietnam-VNM

Indegree centrality shows how much a node is connected to others through incoming ties.

Maps generated using Gephi Network Mapping

Source: Authors, 2020

Figure 2: Weighted outdegree centrality of the ASEAN countries (2003 – 2016)

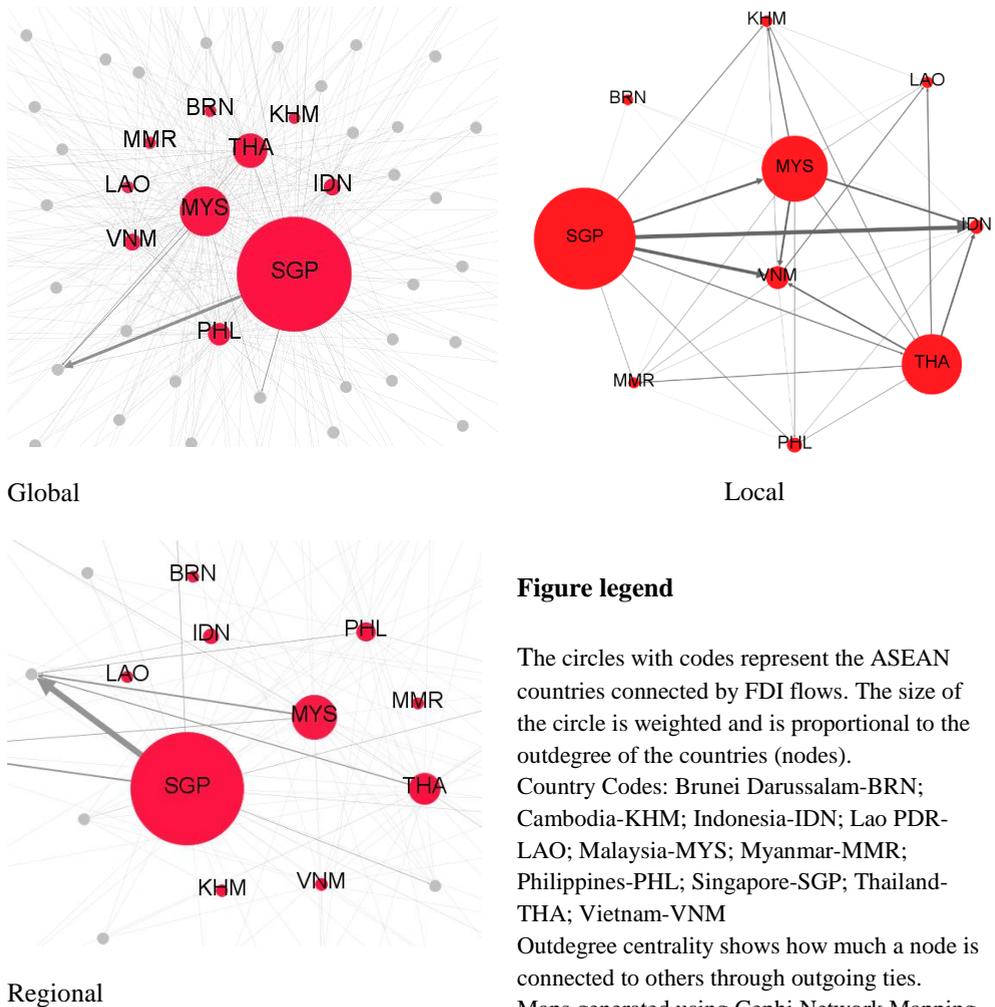


Figure legend

The circles with codes represent the ASEAN countries connected by FDI flows. The size of the circle is weighted and is proportional to the outdegree of the countries (nodes).

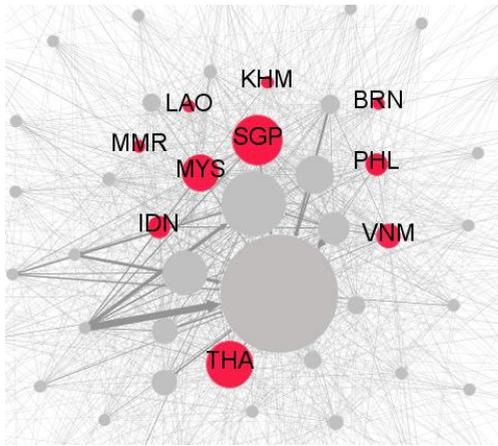
Country Codes: Brunei Darussalam-BRN; Cambodia-KHM; Indonesia-IDN; Lao PDR-LAO; Malaysia-MYS; Myanmar-MMR; Philippines-PHL; Singapore-SGP; Thailand-THA; Vietnam-VNM

Outdegree centrality shows how much a node is connected to others through outgoing ties.

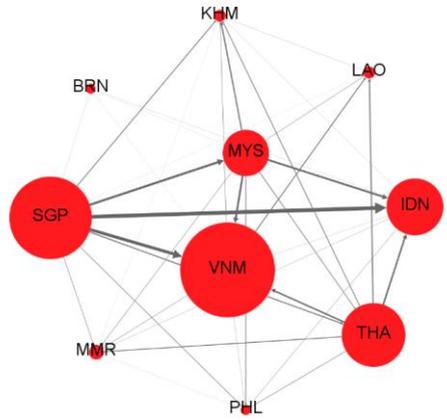
Maps generated using Gephi Network Mapping

Source: Authors, 2020

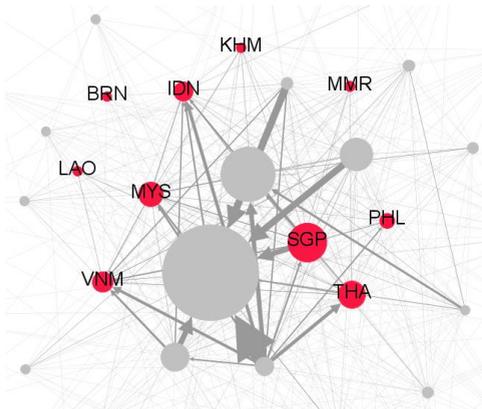
Figure 3: Weighted betweenness centrality of the ASEAN countries (2003 – 2016)



Global



Local



Regional

Source: Authors, 2020

Figure legend

The circles with codes represent the ASEAN countries connected by FDI flows. The size of the circle is weighted and is proportional to the betweenness of the countries (nodes).

Country Codes: Brunei Darussalam-BRN; Cambodia-KHM; Indonesia-IDN; Lao PDR-LAO; Malaysia-MYS; Myanmar-MMR; Philippines-PHL; Singapore-SGP; Thailand-THA; Vietnam-VNM

Betweenness centrality shows how important a node is in terms of connecting other nodes.

Maps generated using Gephi Network Mapping

In a final cross-match between all the networks (Figure one, two and three), the investment ties at a global scale are found to be denser followed by regional and local scale. Also, FDI ties linking ASEAN countries to others is found to be highly disproportionate with most of the linkages connecting a few major nations in the region in terms of both indegree and outdegree. However, the dispersion is higher for indegree compared to outdegree, as more ASEAN nations appear to attract FDI. Nonetheless, Singapore is the only standout nation in terms of outward linkages throughout the global, regional and local networks. Diverging characteristics of the indegree and outdegree positionality of the countries across networks of different scales is also noticed. For instance, Singapore has a strong indegree only in the global network but its outdegree remains strong and consistent in all three scales. On the contrary, Indonesia has moderate outward FDI ties (outdegree) directed towards global, regional and local nations despite its dominant indegree in all scales of integration. From this, it can be said that countries like Singapore holds power in the global economy and are also dependent to their global partners, but at a regional and local scales, Singapore exerts economic power on others through outward FDI but is less dependent on the Asian and ASEAN member nations. For countries like Indonesia, it can be said that it is dependent upon a wide array of nations irrespective of geographical scale, be it global, regional or local but has limited economic influence over others.

3.2. Positionality and Economic Growth

The second part of this study concerns whether the positionality of nations in a network converts to improved economic performance and if the positionality at different scales has differential impacts on their performance. Using panel data covering 14 years (2003-2016) for the ten ASEAN countries, three fixed-effect regressions were conducted (refer Table 4 attached in the annex for the summary of data). Table three below shows the effect of five different network measures of centrality on the dependent variable: economic growth (GDP). The analysis includes three models: Model 1 at a global scale, Models 2 at a regional scale and Model 3 at a local scale.

Table 3: Regression results

(Model 1)		(Model 2)		(Model 3)	
Global Network	Economic Growth	Regional Network	Economic Growth	Local Network	Economic Growth
Indegree	1.19e-05** (0.00)	Indegree	3.43e-05** (0.00)	Indegree	3.65e-05** (0.00)
Outdegree	4.67e-05** (0.00)	Outdegree	5.30e-05*** (0.00)	Outdegree	4.94e-05 (0.00)
Closeness	0.0538 (0.06)	Closeness	0.00546 (0.09)	Closeness	0.0342 (0.07)
Betweenness	0.000108 (0.00)	Betweenness	-0.00107 (0.00)	Betweenness	-0.00825 (0.01)
Eigenvector	0.405 (0.27)	Eigenvector	0.401 (0.24)	Eigenvector	0.103 (0.22)
Enrolment in tertiary education	0.0281*** (0.01)	Enrolment in tertiary education	0.0278*** (0.00)	Enrolment in tertiary education	0.0301*** (0.01)
Employment rate	0.0356 (0.02)	Employment rate	0.0287 (0.02)	Employment rate	0.0326 (0.02)
Corruption control	0.162 (0.09)	Corruption control	0.146 (0.09)	Corruption control	0.185 (0.13)
Shipping connectivity	0.00835*** (0.00)	Shipping connectivity	0.00794*** (0.00)	Shipping connectivity	0.00739** (0.00)
Population density	0.0128*** (0.00)	Population density	0.0141*** (0.00)	Population density	0.0158*** (0.00)
Inflation rate	0.00467 (0.00)	Inflation rate	0.00561 (0.00)	Inflation rate	0.00538 (0.00)
Constant	2.458 (1.44)	Constant	2.765* (1.33)	Constant	2.456 (1.35)
Observations	101	Observations	101	Observations	101
R-squared	0.807	R-squared	0.821	R-squared	0.781
Number of ID	10	Number of ID	10	Number of ID	10

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors, 2020

Model 1 examines the centralities of the ASEAN countries in the network formed by the investment linkages between ASEAN and countries world-wide (global) influencing economic growth and demonstrates that the indegree ($\beta = 1.19e-05$, p-value = 0.05) and outdegree ($\beta = 4.67e-05$, p-value = 0.05) centrality have a significant positive effect on economic growth. With each additional incoming investment tie, the predicted probability of an increase in the GDP is 1.19e-05 percentage and with one unit increase in the outward FDI connectivity, the GDP is likely to grow by 4.67e-05 percentage. Betweenness, closeness and eigenvector measures of centrality were not found to have a statistically significant effect on economic growth.

Model 2 examines the centralities of the ASEAN countries in the network formed by investment linkages between Asian and ASEAN countries (regional) influencing economic growth and demonstrates that the indegree ($\beta = 3.43e-05$, p-value = 0.05) and outdegree ($\beta = 5.30e-05$, p-value = 0.01) centrality have a significant positive effect on economic growth. With each additional incoming investment tie from a regional partner, the predicted probability of an increase in the GDP is 3.43e-05 percentage and with one unit increase in the outward FDI connectivity, the GDP is likely to grow by 5.30e-05 percentage. No other centrality measures were found to have a statistically significant effect on economic growth.

Model 3 examines the centralities of the ASEAN countries in the network formed by intra-ASEAN investment linkages (local) influencing economic growth and demonstrates that only indegree ($\beta = 3.65e-05$, p-value = 0.05) centrality have a significant positive effect on economic growth. With each additional incoming investment tie, the predicted probability of an increase in the GDP is 3.65e-05 percentage. No other centrality measures were found to have a statistically significant effect on economic growth. As claimed by the broader literature, indicators of human capital (enrollment in tertiary education), infrastructural development (linear shipping connectivity) and population density (demography) included in the model as control variables were also found to have a statistically significant effect on economic growth.

4. DISCUSSIONS

The findings of this study show that the investment ties of ASEAN countries at a global scale are denser followed by regional and local scale, supporting (Friedmann 1986) which claims that places have become economically disconnected from their local geographies with growing global connections. Further, the results illustrate the persistence of a highly polarized investment

network between ASEAN countries and their allies, dominated by the links between few key ASEAN countries and their global, regional and local investment partners. Incoming investment links, as captured by indegree centrality, remain significant for five out of ten countries on the global scale, and four and two in the regional and local scale respectively. In terms of outdegree, Singapore is the only standout nation in the network in all three scales. This remains concomitant to extant networks literature, which has also highlighted on the disproportionate geographical distribution of corporate networks (Wall and Knaap 2011, Carroll 2007) resulting in the concentration of investments links between few key nations (Driffield and Love 2005). In fact (Wall et al. 2011) claim that high interconnectedness is found only between some countries and most corporate links start from and are directed to the 'happy few'.

From the results, it is also found that the linkages of ASEAN nations based on indegree and outdegree are divergent in characteristics. While substantial outdegree is noticed only for Singapore, indegree instead is found to be comparably more dispersed over five nations. This is consistent with (Wall 2009) that posit, the economic power of nations as shown by outdegree in a network occurs in limited developed places (cities) and inward linkages are more spread over many places. Furthermore, concerning the positionality of ASEAN countries across networks of different scale, the results show that some of the nations do tend to occupy altered positions in different network scales as highlighted by (van der Knaap 2006). For instance, the results show Vietnam's betweenness is not high in the global and regional network, but it holds the most dominant betweenness position in the local network. Likewise, a noticeable shift is seen in the indegree positionality of Singapore. While it has a strong indegree position in the global network, its positionality in the regional network gets feebler, which further reduces in the local network.

A weak association is found between indegree and outdegree positionality of the ASEAN nations opposed to (Alderson and Beckfield 2004), showing nations with higher outdegree do not necessarily have higher indegree and vice versa. This is visible through Indonesia's indegree position in all scales of integration, which is the foremost among all the ASEAN nations even with its moderate outdegree position. Similarly, at a regional and local scale, Singapore has a moderate indegree regardless of its stronger outdegree centrality. Unlike (Wall 2009), which suggest places with strong outdegree is also likely to take strong betweenness position in a network, no robust association is detected between outdegree and betweenness. While it appears to be proper in case of Singapore, it is contradictory for Vietnam as it is noticed that

even with its lower outdegree, it takes a central intermediary role in the intra-investment links taking place between ASEAN nations.

The results of the regression analysis show that indegree centrality of ASEAN countries in all spatial scales has a significant positive effect on economic growth. On the other hand, the centrality of the ASEAN nations in terms of outdegree is found to share a significant positive correlation with economic growth only at a global and regional scale. Generally, the result is consistent with (Wall 2009), showing a strong positive cohesion between indegree and outdegree with national GDP which was competitiveness in the case of former. Nonetheless, Wall's assessment on the relationship was deprived of a scalar viewpoint. In this study, we do not find a strong correlation between outdegree at a local scale and economic growth. Further, the results of this study contradict to (Pain et al. 2016) which found no generalized relationship between city connectivity and economic growth for US and European cities. However, the networks explored and the context of both studies are different. While (Pain et al. 2016) concerns, corporate, air and maritime connectivity of European and US cities, this study explored FDI networks of the ASEAN countries. Also, in the former, the number of ties between cities is used as a general indicator of network connectivity, but this study analysed the relationship based on positionality using five different network centrality measures.

In comparison to numerous FDI and economic growth studies which are based on non-relational data, the results of this study provide a similar perspective on inward FDI, showing that incoming FDI ties (indegree) from global, regional and local partners irrespective of their geographic proximity (scale) is likely to augment economic growth of the ASEAN nations. However, opposed to majority extant studies which provide a notion that outward FDI (outdegree) to anyplace regardless of geographic scale will boost the economy, this study finds that outward FDI (outdegree) to global and regional allies may be more beneficial than local partners. This relates to (Makino et al. 2002) which assert that local firms by investing abroad will get access to fresh assets, know-how, natural resources and markets that might not be available locally contributing to their economic performance. Similarly, outward FDI according to (Goh et al. 2013) allows overcoming local resource limitation and expands access to international markets raising profit opportunities of the host market.

5: CONCLUSIONS

First, this paper explored the positionality of ten ASEAN nations in their global, regional and local investment (FDI) networks using three network measure of centrality. Second, the relationship between network positionality in different scales of integration and economic performance were examined (2003 and 2016) for the Southeast Asian countries.

This article contributes to the converging studies on networks and international economics, serving to plot an understanding of positionality and how it might impact on the economic performance of nations from a scalar perspective. It contributes to the understanding of how positionality can be ascribed to nations at spatial scales ranging from the local to the world region. Members of the same ASEAN region typically are positioned differently concerning one another, both within the region and with respect to the rest of Asia or globally, and such differences may exist among cities/nations of any territory. A nation's positionality varies and depends on the scale at which it is examined.

The importance of studying different scales of economic integration is reflected in the findings, that no single scale analysis provides a complete understanding of the actors in the network and their associated impacts. In a similar note, the findings of the study are suggestive of the need for nations to adopt multiple scales of interventions and policy to seize desired positions at different scales of integration to achieve higher growth. Further, paying attention to positionality based on different measures of centrality can also provide deeper insights into the role of each nation within a network supporting strategies to guide or alter its trajectory.

Although the analysis in this study has not demonstrated causality between positionality and economic growth, it has been shown that there is a strong positive cohesion between network measures of indegree in all scales of integration and, global and regional outdegree with the economic performance of nations. In this light, it is arguable that the integration of nations with other nations in the world economic system through resources like inward and outward investments appear to be significant to the growth of nations. Hence, administrators and policymakers should not only consider the forces that are found 'within' national boundaries but it is also essential to consider external relationships and connectivity to achieve higher growth. As it stands, only a few countries in Southeast Asia holds strong positions in the network as reflected by their indegree and outdegree centralities, hence, conditions to further the investment attractiveness for inward FDI ties and

enhancing global and regional outward investment linkages appear to be a potent strategy to further economic growth of the ASEAN nations.

The limitation of the first part of this study is that the work is particularly descriptive. However, combined with theoretical arguments, this study does offer certain insights into the network characteristics of the ASEAN countries. Further, it is worth mentioning that this study evaluated FDI networks which reveals only a partial view of the connections of the ASEAN. Economic networks like FDI are likely to be one of the most important networks to study, however, in an intertwined society, other types of economic, social and political networks may also play significant roles. Hence, we recommend future research may focus on other important networks to refine the understanding of network positionality and their associated socio-economic impacts. Last, the empirical model employed in this study considers that the variables are exogenous. Thus, the potential simultaneity bias should be addressed in future research.

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ANNEX

Table: Summary of the data

Indicator	No. of observations	Means	Standard Deviation	Min.	Max.
GDP per capita (USD)	140	9837	15363	219	56336
Global In-degree	140	5112	4512	0	17071
Global Out-degree	140	1546	2871	0	15059
Global closeness	140	0.37	0.25	0	1
Global betweenness	140	66.5	87	0	474.8
Global eigenvector	140	0.64	0.29	0	1
Regional In-degree	140	2507	2547	0	10446
Regional Out-degree	140	1137	2285	0	11345
Regional closeness	140	0.38	0.26	0	1
Regional betweenness	140	21.1	27.5	0	96.5
Regional eigenvector	140	0.64	0.28	0	1
Local In-degree	140	854	1155	0	6213
Local Out-degree	140	854	1604	0	10626
Local closeness	140	0.48	0.37	0	1
Local betweenness	140	2.65	3.8	0	13.9
Local eigenvector	140	0.66	0.28	0	1
Population density (people/km ²)	140	59.1	69.2	0.35	261.1
Inflation rate (%)	140	5.4	6.5	-22.1	23.6
Enrolment in tertiary education (% 15+)	101	24.4	12.4	2.8	52.7
Employment to population ratio (%)	140	69.2	7.8	57.7	85.2
Control of corruption	130	-0.29	1.03	-1.69	2.41
Liner shipping connectivity	117	35.2	35.1	2.47	122.7

Source: Authors, 2020

CASE STUDY



THE EVOLUTION OF THE FINANCING OF HEALTH SERVICES IN ROMANIA, FROM THE SEMASHKO MODEL TO THE BISMARCK MODEL

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Abstract: *The health status of the population has always influenced the economic state of the country and has been influenced, in turn, by the economy. Due to the increased index of disease worldwide, an aspect that leads to the increase of the costs of health services, there is more and more talk about the difficulty of the states in the financial support of this sector. The present article intends to carry out an analysis of the evolution of the financing models adopted by Romania during communism and post-communism. The importance of the topic addressed derives from the understanding of health as a resource for the development of society and not as a resource consumer, while understanding the role of decision-makers in the importance of efficient management of financial resources for this sector. Thus, beyond the individual perspective on health, its subjective perception and the individual decision to choose behaviors that keep the state of health in the balance, the state can be an important factor in ensuring the functioning of this system.*

Keywords: *Semashko, Bismarck, financing, Romania healthcare system*

JEL Classification: *A12, B51, H51, I15*

1. INTRODUCTION

The costs for healthcare have increased, in recent years especially, at rates that exceed the growth of incomes, this difference is seen by many analysts, economists and political decision-makers, as a prominent problem for many states, generated, on the one hand, by the unhealthy lifestyle and, on the other hand, by the lack of investment in prevention. The essential factor, in this sense, is the low

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income at the national level, which do not allow to improve the lifestyle of each individual and also do not allow the investment in a quality health system and able to cover all the necessities.

The system of health services in Romania from 1948 to 1989 was inspired by the Soviet model Semashko, a centralized state system, which seemed to guarantee free access to health services for the entire population. It was based on the centralization of the financial resources by the Ministry of Health, asking patients to use only the services in their residential area, respecting the principle of territoriality, and it operated in an economic environment without the existence of the private sector and, implicitly, of the private health insurance. During the communist period, which ended with the anti-communist revolution of 1989, health services functioned inefficiently, not only because of the centralized organization and funding but also because of the limited volume of resources allocated to this sector.

2. THEORETICAL FRAMEWORK

2.1. Research methodology

The research methodology comprises qualitative and quantitative research; qualitative research offers the possibility of a deep understanding of the subject of the research and, in this way, the chance of a complex explanation of it, by methods such as the analysis and synthesis of the specialized literature, which ensures the formation of a faithful image on the studied phenomena. The qualitative dimension used will support the analysis of the knowledge stage, the presentation of the main paradigms of the field and the analysis of the bibliographic data. The quantitative part of the research methodology is based on the grouping method, the comparison method, the indicators method, the statistical data analysis methods; the data needed for the quantitative analysis were collected from official sources, respectively the Statistical Yearbooks of Romania from 1948-1989, the Official Reports of the statistical institutes and official sites, such www.data.worldbank.org.

2.2. Literature review

The financing of the health sector has proved to be an important topic since the 1970s when numerous researches highlighted the need for financial support for the health status of the population. Among the authors who have studied the importance of financing health services, from 1970 to 1990, are Kleiman (1974), Newhouse (1977, 1987), Culyer and Jonsson (1986), Donaldson and Dunlop

(1986), Parkin et al. (1987), Culyer (1989), Milne and Molana (1991), Getzen and Poullier (1991), Gerdtham and Jonsson (1991), Hitiris and Posnett (1992), who demonstrated the existence of a positive correlation between public spending and health status of the population, in most OECD countries. More recent research has also focused on assessing the importance of the correlation between the volume of public spending with health, the health of the population and the growth of GDP, respectively Murthy and Ukpolo (1994), Hansen and King (1996), Di Matteo and Di Matteo (1998), Di Matteo (2005), Gruen and Howarth (2005).

In the last century, in Europe, three models of public health systems have been affirmed, with the coordinators defining how to finance and organize the provision of health services: The national health care system – Beveridge, the health insurance system – Bismarck, Centralized health system – Semashko; to these, the model that operates predominantly in the U.S. could be added and in a few other states and that is practically based on private health insurance.

The health insurance system – Bismarck was introduced by Otto von Bismarck, in Germany, and is the most widely used system, based on the provision of health services to the population, based on compulsory health insurance. This system works in Germany, Austria, Belgium, Switzerland, France, Romania, Luxembourg, and the Netherlands, with some differences from one country to another. It offers wide coverage, but the population that is not included in the field of work remains outside the coverage of medical services. This economic financing model was studied by Gerlinger and Schmucker (2009), Manoj and Ashutosh (2010), Audretsch et al. (2015), Goldberg (2016).

The centralized health system – Semashko was introduced in the Soviet Union by Nikolai Alexandrovich Semashko, in 1918. The model has founded on the premise that the government is responsible for providing healthcare. The control, financing, and organization within this model were carried out by the state by collecting participation rates for financing, applied to the wage mass. This model requires patients to use only the services provided in their area of residence and operates in an economic environment where private health insurance is lacking. The Semashko type system is, par excellence, a socialist health system, based on centralized planning and access to care of all citizens; is found in Russia, Poland, Hungary, Czech Republic, Croatia. Cockerham (2001), Vlădescu et al. (2009), Shishkin et al. (2014) are among the authors who have studied this model of financing the health sector.

2.3. The evolution of financing health services before '89

After the end of the Second World War (1939-1945), the Romanian health system went through a period of recovery (1945-1947) characterized, mainly, by the effort to restore the destroyed health institutions, to adapt the health services under peace conditions and launch anti-epidemic campaigns to eradicate outbreaks during the war. During that period, the health system faced a high frequency of social diseases, infant mortality, low material base, lack of medical staff and insufficient financial resources. (Ursea, 2009, p. 306).

Romania came out of the Second World War marked by serious public health problems, which slowed the economic recovery of the country. The outbreaks that broke out during the war, and continued into the 1945s, were maintained by the lack of doctors; Between 1944 and 1945 there were less than 50 specialists in infectious diseases and about 140 pediatric doctors. (Statistical Yearbook of the Socialist Republic of Romania, 1981, pp. 12 – 15). The new health system took shape in 1948 and was finalized in the following decade under the leadership of the communist regime, which began the reconstruction of Romania, following the socialist principles imposed by the Soviet ideology, by issuing new legal regulations with the main purpose of eradicating private property. In 1949, according to Decree no. 134 of April 2, 1949, for the nationalization of health units (Decree no. 134/1949), a public health sector is created, which offers free health services to the entire population, operating according to the Semashko financing model.

The years 1948-1950 represent the actual stage of the establishment of the socialist system of health organization. The refining of medical care becomes public and, thus, a unitary system of hospital and ambulatory care managed by the Ministry of Health takes shape; centralized management has made the main tasks of the health system possible through systematic, planned actions, which aimed at comprehensive coverage with health services. (Pavelescu, 2006, pp. 276 – 277). After realizing the first state economic plans and building the socialist health system, it followed the stage of developing its material basis according to the principle of territoriality, which included the period 1951-1965. Then, in the years 1965-1980, it was intended to be the stage of modernization and improvement of the field of health protection. (Ursea, 2009, pp. 315-316). The whole period was aimed at restoring and developing the economy of the country after the Second World War; this objective was to be achieved through investments in population health and by increasing birth rates.

Public health services have become compulsory and financed entirely from public sources, implemented by local health institutions and monitored by the

Ministry of Health. Since 1966 norms have been established for the organization and functioning of the sanitary units, by Decree no. 466 May 25, 1966. (Decree no. 466/ 1966). Starting with 1978, the Romanian health system benefits from unitary regulations, through Law no. 3/1978 regarding the health insurance of the population, which establishes all the components of the health activity in our country: "the state guarantees the right to health protection and ensures unrestricted access of all the citizens of the country, regardless of nationality, race, sex or religion, to medical care." (Law no. 3/ 1978); thus, health was among the few areas that benefited from a special law.

The resources of the health system (financial and human) evolved in close dependence on the economic transformations in Romania in the respective years. Thus, fully supported by the state budget, health expenses were a priority in allocating the available amounts. In 1946, the Ministry of Health's budget reached 6.42% of the country's budget compared to 1.7% in 1945. Between 1950 and 1989, there was a significant increase in both the budget allocated to health and the number of people employed. in the system, allowing the expansion and development of the sanitary network throughout the country. (Statistical Yearbook of the Socialist Republic of Romania, 1981, pp. 12-35). Compared to 1950, in 1989 the annual increase in expenditure for this area increased by 29.4 times. (Center for Calculation, Health Statistics and Medical Documentation, 2003, pp. 1-42).

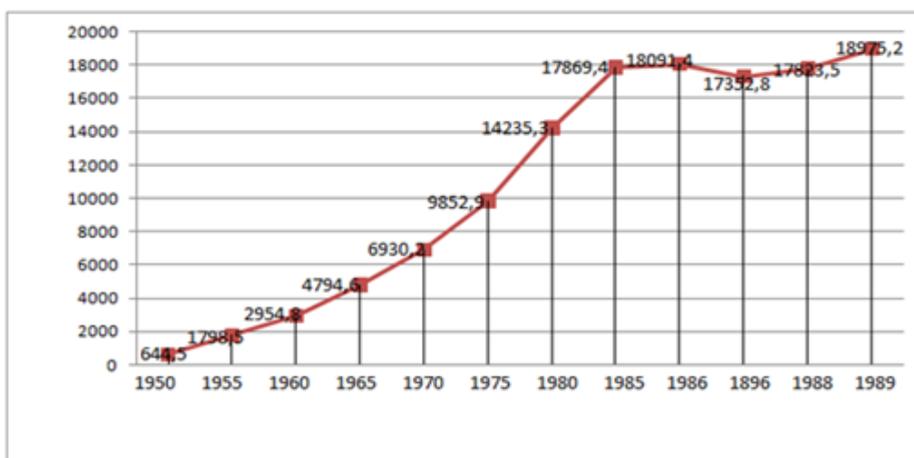


Figure-1: Total health expenses in Romania, 1950 – 1989, millions lei

Source: author, based on the data available in the Statistical Yearbook of the Socialist Republic of Romania (1981) and the Calculation Center, Health Statistics and Medical Documentation (2003)

Between 1950-1955, the average annual growth rate of the total expenditure for health care was 22.78%, and that of the expenditure per capita of 21.31%. The high rate of increase of the expenses destined to the health care was possible both due to the low level at which they were located at the beginning of the 20th century, as well as to the functioning of the public health system of that period. In 1956-1966, the average annual rate of increase of the expenses destined to the health care continued to be high, respectively of 10.81%; from expenditures per capita, the average annual growth rate was 9.81%. Between 1967-1977, the average annual rate of growth of expenditures for health care was 7.25%. Even if, compared to the previous analysis period (1956-1966), the dynamics appear to be lower, the value of the financial resources allocated from the state budget to support the public health system has increased more than twice. Under these conditions, the level of expenditures for health care per capita increased at an average annual rate of 6.05%. Between 1977 and 1989, the rate of increase of expenditures for the operation of the healthcare system was 4.12%; the expenses per head per inhabitant increased at an average annual rate of 3.01%; the annual changes of the respective expenses showed wide amplitude oscillations. Thus, between 1977 and 1981, annual increases between 4.26% and 7.79% were recorded. Since 1986, there has been an increasing instability of the financial resources allocated for the protection of health.

In the period of almost half a century, from the end of the Second World War until December 1989, Romania has undergone profound changes in the economic and health level. The health policy of that period was under the imprint of socialist thinking, of planned social development, of the decisive role of the communist state.

Many aspects incriminate the communist regime concerning the health system, such as the political instrumentation of hospitals and medical controls, the prohibition of abortions, the neglect and lack of resources in hospitals, false reporting of the situations in the health units.

Table-1: The evolution of the health system in Romania, 1945 – 1989

1945	The end of the Second World War
1945 – 1947	The national effort to restore the destroyed health institutions, adapting them to the conditions of peace
1948	The first communist constitution in Romania Imposing the healthcare model Semashko
1948 – 1949	State health fund – nationalization of health institutions
1948 – 1950	The stage of establishing the socialist system of health organization
1951 – 1965	The stage of development of the material basis of health services
1965 – 1980	The stage of modernization and improvement of health services
1978	The state guarantees the right to health protection and ensures unrestricted access to this sector
1989	The end of the communist regime in Romania, shaping the end of the economic model of financing the health sector – Semashko

Source: author

The reasons that led to the necessity of the reform of the health sector were: (1) the continuous increase of the expenses for this sector, without an improvement of the health status of the population; (2) unequal coverage of the population with health services; (3) the inadequate quality of the services provided; (4) the low salary remuneration of the medical personnel in correlation with the increased work volume. (Vlădescu, 2000, pp. 65 – 67).

2.4. The Romanian economic model for financing health services – the Bismarck model, adopted after '89

Romania, as well as other former socialist countries such as Albania, Bulgaria, Slovakia, Slovenia, Lithuania, operated in accordance with the principles of a centralized healthcare system based on the Semashko model. The fall of communism meant a set of reforms, meant to bring Romania's health system closer to the German model, namely the Bismarck model, and to also implement an alternative to the public health sector, the private health system.

With the Law no. 145/1997 of the social health insurance, the medical system became predominantly Bismarck type, through the compulsory insurance rates paid by taxpayers, fixed according to their incomes. Thus, the law of social health insurance came into force, which regulates the functioning of the system of health protection of the population. This system assumes that the social health insurance funds are made up of the contribution of the insured persons, of the natural and legal persons who employ employees, from the subsidies from the state budget, as well as from other sources; also, social health insurance is obligatory and operates decentralized, based on the principle of solidarity and subsidiarity in the collection

and use of funds, as well as the right of free choice by the insured of the doctor, of the health unit and the health insurance house. (Law no. 145/ 1997). However, according to statistics, there are a large number of people who cannot access the medical services they need, the main reason being the lack of financial resources.

In the early 1990s, the move to diversifying funding sources was seen as a way to raise health funds. Thus, in 1992, the government introduced the partial compensation of medicines, concurrently with the creation of a special Fund for health, represented by a coefficient of 2% of the tax on salary and also from the funds collected from tobacco taxes and alcoholic beverages, as well as from advertising for this type of product. (Ursea, 2009, p. 376). However, until 1997, the taxes collected on the state budget remained the main source of financing for the health system in Romania. Currently, the health system in Romania represents the modified revision of the Bismarck model, with the influence of the Semasko and Beveridge models as well. Private health insurance is an optional system, in addition to compulsory health insurance, supporting the organization and functioning of the social health insurance system, in a complementary, supplementary or substitute way.

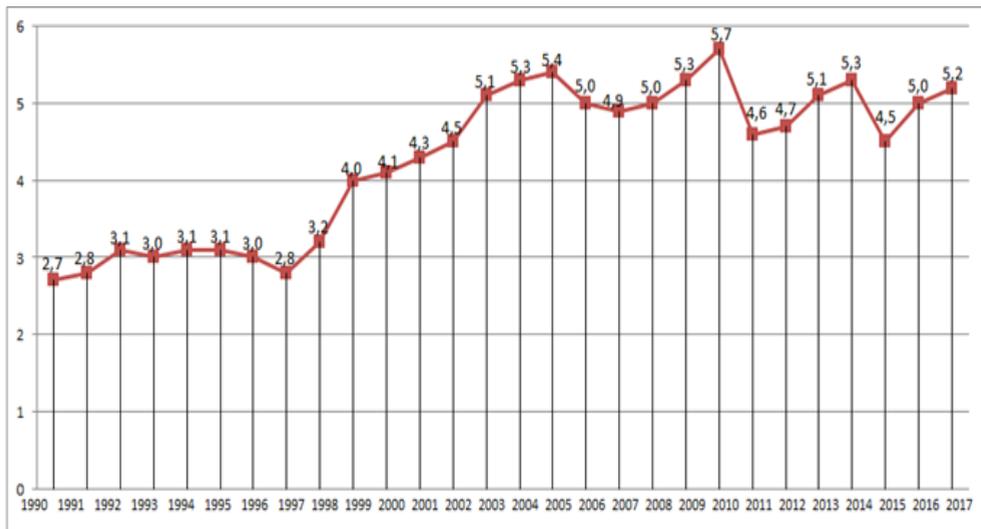


Figure-2: Financing of the health sector in Romania, 1990 – 2017, as a percentage of GDP

Source: author, based on data available at

<https://data.worldbank.org/indicator/SH.XPD.CHEX.GD.ZS?locations=RO>

Between 1990 and 2017, there is an increase in health financing as a percentage of GDP, as a result of the development of this sector and the provision

of the necessary care to the population. The period 1991-1996 saw an increase in the expenditure of this sector, from 2.7% of GDP in 1990 to 3.1% in 1995, and in 1997 the percentage allocated to this sector will again be 2.8 %. The period from 1999 to 2005 saw a constant and significant increase in health expenditure, from 3.2% in 1998 to 5.4% in 2005. The following years show a fluctuation in the health sector's financing, respectively a decrease in 2005 – 2008, followed by an increase in the years 2008 – 2010; in 2011 a percentage of only 4.6% of GDP was allocated to health, following an increase until 2014; in 2015 the lowest percentage of GDP was allocated to the healthcare sector in the last 12 years, respectively 4.5%, as in 2002; 2016 and 2017 represent an increase in the financing of the health sector, respectively 5.0% in 2016 and 5.2% in 2017.

3. CONCLUSIONS AND IMPLICATIONS

Financing the health sector is a problem, as well as addressed, so difficult to solve. It is known that well-managed financial resources can lead to an increased degree of efficiency of the health sector, but at present most states are facing difficulties in ensuring a solid base of health services. The costs of this system are rising at a rapid pace, which is a problem even for developed countries.

The factors that determine the underfunding of health services are the ones that lead to the over-demand of these services. Thus, the precarious state of the economy, which determines a low percentage of the GDP allocated to the health sector will perpetuate, due to the fact that the health status of the population, together with the labor force, will be diminished; at the same time, the need for free and/or compensated medicines will increase, as well as the cases of retirement due to health reasons. The costs of these services have increased due to the inability of the state to finance the volume of requests of the population, which means that the health status of the population has decreased while the capacity of the state to finance this system has decreased and at the same time with the increase of the price of the health services.

The economic models of financing existing in the health services, for good functioning, have to be adapted according to the country in which they operate. Each system has its own advantages and disadvantages, as well as changes depending on the needs of the population: the Beveridge system has a relatively good impact on the health status, but involves long waiting lists for certain medical services, as well as high level of bureaucracy; the Bismarck system offers a high level of performance, but the costs involved are among the highest in the world; In the case of the Semashko model, competition is lacking, which makes the system

lacking in performance. The system of private health insurance is used by only a few states, because of the high costs involved, as well as of a general idea that the state does not have to take care of the health status of the population.

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SURVEY ARTICLE



GOVERNANCE AND ACCESS TO FINANCE

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Abstract: *This paper reviews the literature on institutional quality and corporate governance and it assesses the impact of the two levels of governance on firms' access to finance. The literature sustains that both institutional quality and corporate governance are important drivers of bank lending activity and equity financing. Among the institutional quality indicators that proved to be most effective are creditor rights, transparency and contract enforcement. The corporate governance attributes that manifest important effects on firms' financing are the board size, ownership and monitoring of managerial decisions that reduces agency costs. The legal institutional framework and firms' corporate governance influences the level of a country's financial development a complementary manner.*

Keywords: *access to finance, institutional quality, corporate governance, firm performance*

JEL Classification: *E44, E61, G18, G24, G28, G32*

1. ACCESS TO FINANCE IMPORTANCE

Access to finance has been a subject of great interest for both policymakers and researchers, as they have the responsibility to eliminate or diminish the constraints faced by the companies in achieving the necessary financial resources. Despite their efforts, expanding access to finance remains an important challenge in many countries (Demirgüç-Kunt, et al., 2008).

Companies worldwide are confronting with several constrains that hamper them to acquire the necessary funds for their operational transactions, long-term investments, research and innovation preventing them from reaching higher levels of sustainable growth and taking advantages of opportunities in their sector (IFC, 2013). This situation affects mainly the small and medium-sized enterprises, an important sector from developed and developing countries (Beck & Demirguc-Kunt, 2006). Kumar and Franciso (2005) studied empirically the relationship

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between access to finance and firm size, concluding that firm size is more important than the firm performance in accessing finance.

The constraints faced by the companies arise both from supply-side and demand-side (IFC, 2013). Supply-side constraints are relevant due to market imperfections, including here information quality and availability as less developed countries might not have well-established and functioning systems and, additionally, small firms might not be registered or might lack credit history. Another obstacle for the SME finance is the lack of effective collateral regimes, as small and young companies usually have higher proportions of movable assets compared to immovable assets. Administrative and risk management costs are another important constraint in providing loans to SME, as these companies have lower survival rates, higher revenue volatility, low risk diversification and greater vulnerability to crises. Other constraints refer to restrictive bank regulatory framework, lack of bank competition, government intervention and corruption. On the other side, there are demand-side constraints when firms voluntarily limit their demand for credit if they are uncertain that they will be profitable enough to support lending costs.

The companies' possibility to access financial resources has important implications in terms of financial development (Aghion, et al., 2007; Klapper, et al., 2006; Demirgüç-Kunt, et al., 2008), employment (Fowowe, 2017; Rahaman, 2011; Dinh, et al., 2010), poverty reduction (Hasan, et al., 2020) and economic growth (Buter, 2011).

Improved access to finance creates an environment conducive to new firm entry, innovation and growth enhancing the financial development (Demirgüç-Kunt, et al., 2008). The importance of financial access for firm entry is highlighted by several papers. The results obtained by Klapper et al. (2006) for 21 European countries suggest that new firm entry creation depends on access to start-up capital. These results are confirmed by Aghion et al. (2007) for a sample of 16 European countries, demonstrating that higher financial development enhances new firm entry and post-entry growth of firms in sectors that depend more heavily upon external finance. Moreover, it has been proved that access to finance enhances firms' innovative activities (Efthyvoulou and Vahter, 2016), firms' productivity (Giang et al., 2019; Butler and Cornaggia, 2011) and their sales (Rahaman, 2011).

More developed financial systems improve overall efficiency and promote growth and employment (Demirgüç-Kunt, et al., 2008). Improving access to finance has positive effects on employment as it creates a suitable environment for new firm creation and it sustains the growth of the existing ones (IFC, 2013). The beneficial

effects of developed financial systems on employment are highlighted by Dinh et al. (2010), Dao and Liu (2017), Rahaman (2011) and Fowowe (2017). Firms that have a loan or an overdrafts facility increases the growth in a firm's number of permanent employees by 3.1 percent (Dinh et al., 2010). This result is confirmed by Dao and Liu (2017), who sustain that relaxing financial constraint faced by a firm increases its employment growth and the effects are larger the smaller the firm and the more labor-intensive its production structure. Furthermore, the literature sustains that job creation from both developing and developed countries are affected by financial frictions. The results obtained by Fowowe (2017) have shown that inadequate finance has an inhibiting effect on employment of African firms. For UK and Ireland firms, Rahaman (2011) found that an increase in external finance availability determines firms to rely less on internal funds and switch to external finance with quantitatively more important effects on employment.

Increased access to finance has an impact on poverty, as it creates job opportunities, reduces inequality and reaches self-employment individuals through microfinance (IFC, 2013). According to Brei et al. (2018) more finance reduces income inequality, the effects being more visible in bank-based markets compared with capital markets. Hasan et al. (2020) studied various determinants of wealth inequality, capturing economic, financial, political, institutional and geographic indicators, and concluded that access to finance plays an important role in reducing inequality.

Furthermore, developed and well-functioning financial systems are essential for economic development (Demirgüç-Kunt, et al., 2008). Financial development that makes external finance accessible for firms should promote the growth of firms, and by extension, aggregate growth. (Popov, 2017). However, the empirical research reveals different results, the impact on economic growth depending on the level of financial depth (Arcand, et al., 2012), institutions quality (Demetriades and Law, 2006), bank supervision and regulation (Arcand, et al., 2012), inflation (Rousseau and Wachtel, 2002). Arcand et al. (2012) found that financial depth and economic growth were positively related till the ratio of private credit to GDP reached levels of 60-70 percent, above ratios of 80-100 percent the impact was negative. This might be an explanation on why developing countries benefit most of increased access to finance. Furthermore, in countries with high institutional quality and strong bank supervision financial depth has a positive and significant effect on economic growth when credit to the private sector is below 20% and 55%, respectively (Arcand et al., 2012).

2. GOVERNANCE AND FINANCE NEXUS

We delimited the governance impact of finance based on the level of governance and its objective. Therefore, we considered worldwide governance and corporate governance. The World Bank governance indicators reflect the worldwide thrust toward political and economic liberalization (Islam, 2014), while corporate governance is the system of rules, practices and process by which a firm is directed and controlled (Chen, 2020).

2.1. World Governance Indicators and finance

World Bank defines governance as the traditions and institutions by which authority in a country is exercised. These institutions refer to legal, political and supervisory bodies that provide cohesion and order in business activities (Manasseh, et al., 2017).

The Worldwide Governance Indicators report six broad dimensions of governance: Voice and accountability, Political stability and absence of violence, Government effectiveness, regulatory quality, Rule of law, Control of corruption. Voice and accountability and Political stability and absence of violence refer to the process by which governments are selected, monitored and replaced. Government effectiveness and regulatory quality refer to the capacity of the government to effectively formulate and implement sound policies. The last two dimensions, Rule of law and Control of corruption, focus on the respect of citizens and the state for the institutions that govern economic and social interactions among them.

World Bank defines voice and accountability as perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Political stability and absence of violence/terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Governance effectiveness captures perceptions of the quality of public services, the quality of the civil services and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Regulatory quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Control of corruption captures perceptions of the extent to which public

power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of the state by elites and private interests.

La Porta et al. (1997) highlighted that in a sound and efficient judicial system, companies rely on external finance to fund their investments and this leads to the development of the financial markets. In the next sections we will discuss the impact of institutional quality on the most important sources of financing – bank lending and stock markets.

2.1.1 Impact of institutional quality on bank lending activity

Banking system represents an important source of financing for households and companies. To be able to perform its functions properly the institutional environment in which banks operate should be of high quality. High quality institutions reduce the cost of external financing, the main mechanism through which an adequate legal framework favors financial development (Arias, et al., 2019).

Djankov et al. (2005) studied the effects of creditor rights, referring here to how easily creditors can force repayment, grab collateral or even gain control of the firm legally and the effects of information transparency, as if lenders know more about borrower they will extend credit offer. The sample used consist of 129 developed and developing countries analyzed during 1978-2003. The results suggest that both better creditor rights and higher information transparency are associated with a higher ratio of private credit to GDP, with creditor rights particularly important in developed countries and information transparency in developing countries. These results are confirmed by Galindo and Micco (2016) who find that better creditor protection and the development of information-sharing mechanisms increase the bank credit availability for small and medium-sized enterprises, reducing the financing gap between small and large firms.

Creditors' rights and contract enforcement have been studied by Bae and Goyal (2009) for 48 countries during 1994-2003. The results show that better enforceability of contracts increases loan size, lengthens loan maturity, and reduces loan spreads. The average loan amount will increase by about \$57 million if a borrower moves from a country in a sample with the weakest enforcement to a country with the strongest enforcement, all else equal. For these countries, the creditor rights manifest a weak impact, often statistically insignificant. Safavian and Sharma (2007) concluded that creditor rights and contract enforcement are strong complements, as firms have more access to bank credit in countries with better creditor rights and efficient courts, capable to enforce contracts. The study covers 27 European countries from 2002 to 2005.

Furthermore, in a study on 66 global countries during 2000-2015, Kapounek (2017) show that economic freedom, openness and globalization manifest negative effects on lending activity of government banks, while low regulations increase lending activity of private banks.

There are several studies in the literature that focus only on developing countries, whose institutional quality is lower with poor enforcement laws and inconclusive impact on bank lending activity. Qian et al. (2017) investigated the impact of legal protection and law enforcement on bank lending for 25 developing countries from Europe and Asia. Their results suggest that legal protection reduces the volume of banks' loans as banks require more collateral, while law enforcement determines an increase in bank loans.

Hourani and Mondello (2019) studied 231 commercial banks from MENA countries, representing 53% of the commercial banks operating in this region, during 2000-2016. They analyzed the impact of political stability and lack of violence, government effectiveness, regulatory quality, control of corruption and financial freedom on banks credit supply. Using the fixed effects panel method to estimate the results, they found that institutional quality variables are an important determinant of credit supply growth. Regulatory quality and political stability encourages foreign, domestic and private banks to improve their credit supply. On the other hand, financial freedom and government effectiveness impact negatively the growth of banks' credit supply. This might be explained by the poor institutional quality of MENA countries, that behave cautiously by reducing their credit supply and credit risks to increase the quality of their portfolios. The negative and significant effects of government effectiveness on bank lending were also highlighted by Gani and Al-Muharrami (2016) for four countries from the Gulf Cooperation Council Countries. They have also included in their study the impact of rule of law, regulatory quality, contract enforcement and Sharia Islamic principles. While rule of law, regulatory quality and contract enforcement manifest a negative impact on bank lending, the Sharia Islamic principles manifest a positive and significant impact, suggesting that these countries give a greater importance to Islamic sharia law upon which the Islamic way of life and social justice is formulated.

Corruption is another important issue faced by the developing countries, as they have lapses in the rule of law, inefficient judicial system, weak prudential regulation and weak development of institutions crucial for good governance (Anaere, 2014). For African countries, it has been proved that corruption impede bank lending (Anaere, 2014). The same results have been obtained for Russia, where the authors found that corruption reduces loans granted to households and

firms and an opposite effect for loans granted to government (Weill, 2008). Developed countries also face corruption issues, where institutional quality is considered higher. Public corruption decreases bank lending activity of US commercial banks for the 1995-2013 period (Bermpei, et al., 2019). The authors also provide evidence that proxies for relationship lending and monitoring weaken the negative relationship between public corruption and lending activity. For 11 Euro area countries, corruption limits the demand for bank loans of small and medium-sized enterprises (Galli, et al., 2017).

Profitability, stability and efficiency are important determinants of banks' willing to lending to small business (Shaban, et al., 2014). The environment and the institutional quality from the countries where they activate influence these characteristics adding additional conditions on banks' lending. Using a sample of 52 developed and developing countries covering the 2005-2014 period, Arias et al. (2019) demonstrated that a greater degree of legal protection, law enforcement and regulatory quality positively affects banking sector performance expressed through return of assets. On the other hand, a greater degree of information sharing and a better control of corruption does not influence baking industry performance of these countries. Furthermore, the literature shows the positive effects of high quality institutions on bank stability (Bermpei, et al., 2018) and bank efficiency (Lensink and Meesters, 2012).

2.1.2 Impact of institutional quality on stock markets

Stock markets represent another important source of financing, although not all firms have access to it. Asgharian et al. (2014) studied individuals from 14 European countries and demonstrated that high institutional quality leads to higher levels of trust that positively influence their participation in the stock market. In a study on African countries during 1990-2010, Asongu (2012) demonstrated that the World Bank Governance Indicators manifest a positive impact on stock market performance. These finding suggest that better developed government institutions favor stock markets with higher market capitalization, better turnover ratios, higher value on shares traded and a greater number of listed companies.

Stock market performance is an important condition for the companies' access to equity financing. Better governance environments influence stock market performance by increasing investors' protection and confidence (Manasseh, et al., 2017) and reducing both transaction cost and agency costs (Hooper, et al., 2009). Bureaucratic quality, corruption control, quality of contract enforcement and property rights positively influenced the performance of Nigerian stock market

during 1985-2013 (Manasseh, et al., 2017). These results are confirmed for a sample of 50 developed and developing countries in a study that covers 1995-2002 period (Hooper, et al., 2009). The authors demonstrated that the demand for equity finance is influenced more by the quality of governance than the supply of equity finance.

While the overall impact of governance quality on stock market performance is positive and significant, Boadi and Amegbe (2017) decomposed the country sample into high income countries, upper middle income countries and lower middle income countries and found different results for different institutional characteristics. The stock market from high income countries benefits from political stability, rule of law and absence of violence, and suffers from an improvement in voice and accountability and government effectiveness. In lower middle income countries, government effectiveness and regulatory quality had a positive and significant impact on equity indices, while an increase in voice and accountability and rule of law reduces equity indices. Rule of law and control of corruption had a positive and significant impact for upper middle income countries. Therefore, it is important to consider the institutional quality characteristics from each developing area when analyzing its effects, as the rules from each country and area differ.

Chambers and Munemo (2017) used a panel dataset of 119 countries for the period of 2001-2012 to analyze the impact of institutional quality on new firm creation. The authors used the same six dimensions of governance quality and concluded that only political stability, regulatory quality and voice and accountability promote entrepreneurship, a one standard deviation increase in these measures increases new business activity by 30 to 52 percent. Superior quality institutions divert resources toward more productive activities, thereby increasing the efficiency of allocated resources.

The literature sustains also the importance of governance dimensions on financial development. Sayilir et al. (2018) studied the impact of the six dimensions of governance reported by World Bank on seven pillars of financial development during 2012 for 62 countries using structural equation modelling. The results obtained suggest a significant positive relationship between governance and financial development. Therefore, as governance is enhanced, we expect financial development to strengthen as well. The same dimensions of governance have been studied by Samadipour et al. (2017), but for a longer period 1996-2013 and only for developing countries, using dynamic panel data method in descriptive-analytical approach. They divided the sample into low income countries and high income countries. In all estimated models, the

governance dimensions manifest a positive and significant effect on financial development, with the exception of quality of legislation and the general indicator of good governance from high income developing countries.

2.3 Corporate governance and finance

Corporate governance provides the framework for attaining a company's objectives, it encompasses practically every sphere of management, from action plans and internal controls to performance measurement and corporate disclosure (Chen, 2020). Corporate governance establishes the relationship among various primary participants of the firm as shareholders, directors and managers and it formulates the directions and performance of the firm (OECD, 2015).

The attributes of good corporate governance include ethics, managerial discipline, board independence, protection of shareholders' rights, fairness, transparency, board responsibilities, accountability, social awareness and responsibility and environment caretaking (United Nations, 2003). The most important stakeholder of a firm with control over the governance of the firm is the board of directors and they should lead by example and ensure that good standards of behavior permeate throughout all levels of the organization (FRC, 2016). The board of directors represents the interest of a variety of stakeholder – such as the government, local communities, employees, suppliers, customers and regulators – who are directly or indirectly involved in the fortunes of the company (Ghosh, 2018).

Good corporate governance helps companies operate more efficiently, improve access to finance, mitigate risk and safeguard against mismanagement (IFC, 2019). Financial institutions and stock market investors will lean to invest in companies that offer higher levels of disclosure and transparency. By increasing the amount of information provided to the fund providers, a firm can reduce the information asymmetries and the additional costs investors would have asked in cases of less information to cover their risks undertaken (Daud, et al., 2015). Therefore, a good corporate governance increases investment opportunities of firms and can lead to more profitable outcomes.

External investors such as banks and new shareholders assess the corporate governance structures of a firm before making a decision to invest (Mugova and Sachs, 2017). In the next sections we analysis if the attributes of a good corporate governance influence the decision of banks and investors in financing a business.

2.3.1 Impact of corporate governance on bank lending activity

The existing studies show that there is no direct relationship between firm's corporate governance and bank's financing decision (Zhu and Tang, 2016; Quin and Yeung, 2015; Detthamrong, et al., 2017). However, firms' corporate governance significantly influence firms' financial performance and expected outcomes (Vo and Nguyen, 2014; Mohan and Chandramohan, 2018; Al-ahdal et al., 2020; Ciftci et al., 2019; Rose, 2016), the main characteristics on which financial institutions rely on their lending decisions (IFC, 2013). The positive relationship between corporate governance compliance and firms' performance arises because better governed companies enhance efficiency in the monitoring of managerial activities (Akbar, et al., 2016) and reduces agency costs (Weber, 2006).

There are several papers that study the effects of corporate governance on firm performance, expressing firms' corporate governance through different attributes such as financial transparency, ownership structure, board and management structure and process and corporate responsibility (Ghosh, 2018), dual role of CEO, board's size, board independence and ownership concentration (Vo and Nguyen, 2014), firms' comply or explain disclosure (Rose, 2016), audit committee size and audit reputation (Detthamrong, et al., 2017).

Sami et al. (2011) used a composite measure of corporate governance, including ten different items that cover ownership, CEO and chairman duties, number of independent outside directors, the existence of a CEO succession plan and the existence of a relationship among the top 10 shareholders for a sample of Chinese firms during 2001-2003. The results show that the overall corporate governance manifests a positive and significant impact on firm performance, expressed by return on equity and return on assets, suggesting that better-governed firms perform better.

However, when analyzing the individual measures of corporate governance, the results are mixed. Reviewing several studies that investigate the impact of corporate governance attributes on firms from developing countries, it reveals different results due to their different levels of development and corporate governance reforms implemented. In Thailand, the corporate governance is not associated with the performance of 493 firms and their financial leverage registered during 2001-2014 (Detthamrong, et al., 2017). For India and Gulf Corporation Council countries, Al-ahdal et al. (2020) demonstrated that board accountability, audit committee, transparency and disclosure have insignificant effects on firms' performance, while in India larger boards significantly increase firms' performance (Arora and Sharma, 2016). The latter results are contradicted by Mohan and

Chandramohan (2018), who provide evidence that board size and CEO duality significantly reduce firms' performance. In Turkey's case, larger boards, concentrated ownership and foreign ownership proved to effectively improve firms' performance (Ciftci, et al., 2019). Vo and Nguyen (2014) studied the effects of corporate governance on Vietnamese firms' performance, proving evidence that duality of CEO and board ownership improves performance, while board independence and size has no significant effect on firms' performance.

For developed countries, the relationship between corporate governance and firms' performance is also inconclusive, being influenced by the laws of a country where compliance with corporate governance regulations is optional or mandatory. For United Kingdom, where corporate governance compliance is optional, Akbar et al. (2016) found no significant evidence that good corporate governance leads to improvements in firms' performance. In United States, where corporate governance compliance is required by United States corporate law, corporate governance proved beneficial for the companies' performance (Bhagat and Bolton, 2019). Bhagat and Bolton (2019) found that director stock ownership is most consistently and positively related to future corporate governance. For Danish companies, the adherence to the Danish Code of Corporate Governance increases firm performance (Rose, 2016). The comply or explain disclosure of board composition and remuneration policy adopted by Danish firms improves performance, while increasing compliance with the recommendations on risk management and internal controls has no impact on performance. Furthermore, it has been proved that good corporate governance positively influences firms' credit ratings (Weber, 2006).

2.3.2 Impact of corporate governance on stock market

The impact of firms' corporate governance on equity financing is more straightforward compared with the impact of corporate governance on bank financing. A company's corporate governance positively influences equity financing improving firm's access to finance (Haque, 2015; Sharid, 2019). Better corporate governance enhances equity financing by reducing agency costs (Haque, 2015; Moez, 2018; Yegon, et al., 2014), improving investors' confidence in a fair return on their investments (Sharid, 2019; Li, et al., 2016), reducing the cost of equity capital (Gupta, et al., 2018; Chen, et al., 2009) and improving stock liquidity (Ali, et al., 2017; Chung, et al., 2012).

Haque (2015) studies the effect of corporate governance on equity financing, by constructing a corporate governance index that includes ownership patterns, shareholder rights, independence and responsibility of the board and management,

financial reporting and disclosure and responsibility towards shareholders. The results suggest that for Bangladesh, better governed firms have greater access to equity finance due to reduced agency costs. For Kenya, higher director and institutional ownership, smaller sized boards, separation of CEO and chairperson duties and higher remuneration lower agency costs, while board independence increases agency costs (Yegon, et al., 2014). In France, Moez (2018), by conducting a study over 125 firms during 2000-2015, found that ownership concentration reduces agency costs by influencing managerial decisions, while higher institutional ownership and foreign ownership have no significant impact on agency costs.

Guo and Platikanov (2019) demonstrated that institutional investors prefer to invest in stocks of large and widely held firms, in firms with strong disclosure standards, in firms located near their home market and in stocks of companies with good corporate governance. Firm's corporate governance is an important basis for investors to make investment decisions when the stock information is limited (Li, et al., 2016). Their confidence is enhanced by the corporate governance regulation as it guarantees the validity of accountability mechanism, the reliability and quality of financial information and the efficiency of the capital market (Sharid, 2019). Therefore, good corporate governance transmits favorable investment information to investors and enlarge investments opportunities (Li, et al., 2016).

Another beneficial effects of a good corporate governance are the reduction of the costs of equity capital and increased stock liquidity. Gupta et al. (2018) studied 22 countries during 2003-2007 and found that firms with high corporate governance have significantly lower costs of equity capital. They also provided evidence that the country's legal institutional framework and the level of financial development influence this relationship in a complementary manner. These results are confirmed by Chen et al. (2009) in a study on emerging countries, adding that the effect of corporate governance is more pronounced in countries with poor legal protection.

As mentioned before, good corporate governance increases stock liquidity (Ali, et al., 2017; Chung, et al., 2012). Ali et al. (2017) studied a sample of 1207 Australian firms during 2001 to 2013. They found that firms' corporate governance increase stock liquidity by reducing the trading costs and price impact of trade and by increasing the trading frequency. These results are confirmed by Chung et al. (2012) for a sample of 3750 firms worldwide. Investors respond to increased information disclosure of firms and reduction of information asymmetry (Ali, et al., 2017; Chung, et al., 2012).

3. CONCLUSIONS

Access to finance varies around the world and expanding the access remains an important challenge for the authorities in developed and developing countries. The authorities are responsible to adopt policies that enhance the overall development of financial sector that will lower the costs of financial services, improve innovative capacity of the financial sector and help increase access to finance to those excluded (World Bank, 2008).

To attract investors and increase firms' opportunities to obtain resources, one country should have a sound legal, regulatory and institutional framework that market participants can rely on (OECD, 2015). To achieve this, the authorities should adopt the necessary reforms in order to assure higher levels of institutional quality, by reducing the country's corruption, increasing government effectiveness, improving the creditor rights and law enforcement (Bae & Goyal, 2009; Djankov, et al., 2005; Bermepe, et al., 2018).

Corporate governance is another important aspect for one company's access to finance, as banks or investors assess the corporate governance of a firm before making a decision to invest (Mugova and Sachs, 2017). Authorities should assure an environment in which firms could develop their corporate governance by imposing the adoption of corporate governance through law or to provide recommendations through comply or explain principle (Rose, 2016).

There are several papers that sustain that legal and regulatory environments for protecting shareholders at the country level and good corporate governance at the firm level are complementary because strong shareholder protection rights reinforce the effectiveness of corporate governance in improving access to finance (Chung, et al., 2012; Gupta, et al., 2018).

The literature provides evidence regarding the positive relationship between institutional quality or corporate governance and firms' access to finance and financial development (Arias, et al., 2019; Bae & Goyal, 2009; Asgharian, et al., 2014; Haque, 2015). This should determine policy makers and regulators develop new policies to establish a competitive legal and regulatory infrastructure to attract foreign capital (Sami, et al., 2011).

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