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## Article

# Is financial development crucial for all economies?

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## GENERAL & APPLIED ECONOMICS | RESEARCH ARTICLE

# Is financial development crucial for all economies?

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**Abstract:** The relationship between financial development and economic growth has long been recognized and acknowledged in the literature. However, the dynamics of the relationship is yet to be settled, as illustrated by contradictory theoretical and empirical findings. This paper investigates the relationship by splitting 108 countries into sub-groups holding a particular common specificity: level of competitiveness, the legal system, new business entry rate, and income level. Data for this study were collected for 108 countries from a variety of sources for the period 1980 to 2017. Given the large number of countries and periods covered by the study, to control for financial depth without losing country-specific features due to homogeneous aggregation, we employed the Dumitrescu-Hurlin Granger non-causality test to achieve the objectives of this study. The results of the study suggest that financial development plays a significant role for high-income countries, or countries with a high level of innovation, which in turn, correlated with countries with common law legal

### ABOUT THE AUTHORS



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Dr. Fernando Zanella is Associate Professor of Economics, and previous Assistant Dean of Research & Graduate Studies, in the College of Business & Economics, UAE University. He holds PhD from Auburn University (USA). His main research focus is on Institutional, Business and Austrian Economics. He has co-authored research on corporate finance and accounting, and has interest in wider economics issues as they affect the growth and wellbeing of nations. He has published in top journals such as *Public Choice*, *European Business Review*, and *Applied Economics*.

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### PUBLIC INTEREST STATEMENT

Most countries around the world are relentless in the pursuit of economic growth for the “happiness” of their citizenry. While almost everyone recognizes the enduring relationship between economic growth and financial development, we remain unsure about the causal nature of this relationship. In this study, we investigated the relationship for a large number of countries during an extended period of time. To gain a better understanding of this phenomenon, the 108 countries were divided into subgroups based on four specific country-level characteristics—levels of income, competitiveness, legal framework, and intensity of entrepreneurship activity. Our findings indicate non-uniformity of the economic growth-financial development relationship across the countries due to their unique characteristics. From a public policy perspective, it is apparent that some countries should rank financial development high in their priority list in order to achieve/progress economic growth, while those that have progressed beyond this stage need to prioritize other policies.

framework. However, such level of significance could not be established for developing countries

**Subjects: International Finance; Development Economics; Entrepreneurship**

**Keywords: financial development; common law; economic growth; institutions; Dumitrescu-Hurlin granger causality; competitiveness; new business entry rate**

## 1. Introduction

A vast amount of extant literature recognize the enduring relationship between economic growth and financial development, with some economists arguing that financial development is a necessary prerequisite for the achievement of economic growth (see, for example, Patrick, 1966; Bist, 2018). Despite this broad acceptance, several theoretical and empirical contradictory causality findings are documented in the literature (Dawson, 2003; Chang & Caudill, 2005; Shan, 2005; Anwar & Nguyen, 2011; Yildirim et al., 2013; Akinci et al., 2014; Polat et al., 2015; Valickova et al., 2015; Lawal et al., 2016; Nyasha & Odhiambo, 2016; Durusu-Ciftci et al., 2017; Ono, 2017; Ismihan et al., 2017; Asteriou & Spanos, 2019). The fact that the literature shows a multitude of conflicting findings demonstrates that the relationship between financial development and economic growth is still a complex phenomenon worthy of inquiry. Without aspiring to solve such a complex conundrum, but to shed some light on it, this research aims to further our understanding of the phenomenon, by grouping the countries based on four specific country-level characteristics—levels of income, competitiveness, legal framework, and intensity of entrepreneurship activity. Thus, the objective of this paper is to investigate this relationship, by splitting the countries into subgroups that hold a particular common institutional feature.

We collected data from a variety of sources, and employed the Dumitrescu-Hurlin Granger non-causality test (Dumitrescu & Hurlin, 2012), which should expose some common pattern under different sets of underlying conditions such as income level, legal roots, new business entry rate, and competitiveness level. The most important contribution of this paper is to provide more insight on the conflicting theories and results of current studies on the relationship between economic growth and financial development.

Our results indicate diversity in the relationship between financial development and economic growth. For most countries (59 out of 108), we found no statistically significant relationship between the two over the period covered by our study. For 23 countries, we found that financial development led to economic growth, while the opposite was the case for 20 countries. Bi-causality was the least corroborated in this study, as it was supported by our results in the case of six countries only. Furthermore, our results show which of the causal relationships predominates based on each country's legal system, global competitiveness, new business entry rate, and income level.

The rest of this paper is organized as follows: The next section summarizes briefly some extant literature as part of the research hypotheses development process. This is followed by a section on data and variables description. Our methodology and analysis are then presented, followed by the results and conclusion sections.

## 2. Relevant literature and research hypotheses

While there appears to be a near-consensus in the literature about the existence of some relationship between economic growth and financial development (Bist, 2018; Goldsmith, 1969; Levine, 1997; McKinnon, 1973; Patrick, 1966), the question of causality between the two is yet to be settled fully, with conflicting theories and empirical evidence provided in the literature. While a pool of the literature, including Schumpeter and Opie (1934), Murinde and Eng (1994), and Levine et al. (2001), Caporale et al.

(2004, 2005), Beck and Levine (2004), Chang and Caudill (2005), Shan (2005), and Anwar and Nguyen (2011), Akinci et al. (2014), Polat et al. (2015), and Durusu-Ciftci et al. (2017) provide substantial empirical evidence that it is financial development that causes economic growth, others argue to the contrary, providing evidence to the effect that economic growth leads to financial development (see, for example, Akinci et al., 2014; Ang & McKibbin, 2007; Arestis et al., 2001; Ono, 2017). Yet another school of thought believes in the bi-causality of economic growth and financial development (for example, Shan et al., 2001; Bloch & Kan Tang, 2003; El-Wassal, 2005; Rachdi & Mbarek, 2011; Yildirim et al., 2013; Lawal et al., 2016; Ismihan et al., 2017; Asteriou & Spanos, 2019); with the fourth body of literature providing evidence of non-significance of the relationship between the two (Chang, 2002; Dawson, 2003; Nyasha & Odhiambo, 2016; Ram, 1999; Shan & Morris, 2002). We review below some of this extant, and somewhat conflicting, literature that are germane to the process of developing the four research hypotheses of this study. For seminal papers and more complete review of the literature on this subject, please refer to Levine (1997, 2001, 2003), and Bist (2018).

By and large, the causality dispute could be summarized within four hypotheses that are suitable to be tested fully with the Dumitrescu-Hurlin granger non-causality test:

H1: there is no relationship between financial development and economic growth;

H2: there is a causality running from economic growth to financial development;

H3: there is a causality running from financial development to economic growth;

H4: it is a case of bi-causality between the two variables.

First, the relationship exists but it is not relevant or significant (H1). Financial development is downplayed as an economic growth factor in favor of more vital ones, such as human capital, trade openness, technological change, and so on. This first proposition is not accompanied by a large literature affirming the minimal role of financial development. Rather, it is evidenced by its reverse, that is, a large literature on economic growth that does not mention financial development, neither theoretically nor empirically, as a causal factor. Here it is worth mentioning the well-known Lucas (1988) affirmative that: “In general, I believe that the importance of financial matters is very badly over-stressed in popular and even much professional discussion and so am not inclined to be apologetic for going to the other extreme” (Lucas, 1988, p. 6). Specifically addressing this issue, some authors’ findings—by using different econometric techniques and samples—have supported this first proposition (for example, Chang, 2002; Dawson, 2003; Shan & Morris, 2002). Nyasha and Odhiambo (2016), also, did not find a significant impact of market-based financial development on Australia between 1980 and 2012, although they found a bank-based impact.

Second, economic growth leads to financial development (H2). Perhaps the best-known and most incisive statement about this is Robinson’s (1952) “Where enterprise leads finance follows” because profit opportunities require new levels of financial development. Ang and McKibbin (2007) tested the previous hypothesis by using four trivariate vector autoregressive models with data ranging from 1960 to 2001. The authors adopted Malaysia as the country for their study. Their findings are clearly supportive of Robinson’s proposition. In their own words “Contrary to the conventional findings, our results support the view that output growth causes financial depth in the long-run”. Arestis et al. (2001), warning against drawing universal conclusions, wrote that “the link between financial development and growth in the United Kingdom and the United States was found to be statistically weak and, if anything, to run from growth to financial development”. Mixed results are also found in the literature, for example, Rioja and Valev (2004) found a non-

significant relationship for low-income, weak for high-income, but significant for middle-income countries. Akinci et al. (2014) found a unidirectional causality from economic growth to financial development for OECD member countries between 1980 and 2011. Ono (2017), dividing the period between before (1999–2008) and after (2009–2014) the 2008 economic crisis found causality running from economic growth to bank lending in both periods.

Third, financial development promotes economic growth (H3) by facilitating entrepreneurs' access to domestic credit market. To better gauge this link, this paper divides countries as well by the new business entry rate as explained in the next section. There is substantial empirical literature supporting this hypothesis. Perhaps the earliest one to advocate this relationship was Schumpeter (1911) and Schumpeter and Opie (1934), which also associated it with the level of entrepreneurship. Levine et al. (2001) finds support that financial development boosts economic growth by affecting productivity positively. Huang and Lin (2009) found a significant relationship for lower and middle-income countries, but not quite for high-income countries. Caporale et al. (2004) tested seven countries for causality using trivariate tests; their findings support that financial development—either stock market or bank deposits—causes economic growth. In a different study, but with a sample of only four countries, Caporale et al. (2005) again found that causality runs from financial development to economic growth. Beck and Levine (2004), using a panel data set of 40 countries and the Generalized Method of Moments technique, found support for the assertion that financial development is important to economic growth. Chang and Caudill (2005) found unidirectional causality running from financial development to economic growth in the case of Taiwan. Anwar and Nguyen (2011) investigated 61 provinces of Vietnam between 1997 and 2006 and found causality from financial development to economic growth. Akinci et al. (2014) and Polat et al. (2015) found a positive relationship for OECD countries and South Africa, respectively including trade openness as a variable as well. Similarly, also using variables such as trade openness, Ehigiamusoe and Lean (2018) found a long-run causality from financial development to economic growth in Ghana, Nigeria, and South Africa. Rahman et al. (2020) inquiring on the impact of financial development on economic growth in Pakistan found it to be positive for both low and high growth, but especially strong on high economic growth regime. Ogbonna et al. (2020) concluded that financial development positively impacts economic growth of Nigeria in the non-oil sector only.

Fourth, economic growth and financial development go hand-to-hand (H4). Economic growth demands a sophisticated financial market that responds by promoting economic growth. In the same proposition of causality, it might be argued that financial markets have an initial important role (supply-leading) that is immediately followed by economic growth that demands better financial markets (demand-following). The bottom line is that these variables need each other and, despite the initial leading factor, there is a feedback mechanism, a bi-causality. The advocates of this proposition, perhaps more often and emphatically than others, rely on empirical grounds to clarify this issue. Shan et al. (2001), for example, tested 10 countries—though not the same sample and window time—and found bi-causality in half of them; in three of them the causality was running from economic growth to financial development (in this case, also corroborating, but with less emphasis, the third proposition). Bloch and Kan Tang (2003) found bi-causality for a large sample of countries for an extended period of time but the authors stress that, actually, an exogenous factor may be driving the initial growth rate: their findings and large sample and time span bore many similarities with our study. El-Wassal (2005) tested 12 countries from 1988 to 2000. His findings corroborate the bi-causality proposition. Rachdi and Mbarek (2011), Yildirim et al. (2013), Adeyeye et al. (2015), and Ismihan et al. (2017) also found bi-causality in some countries by supporting supply-leading and demand-following simultaneously and in different reaffirming degrees. Meanwhile, Asteriou and Spanos (2019) conclude that during economic times, financial development promotes economic growth, but the causality becomes negative during a crisis in which financial development adversely affects economic growth.



### 3. Data and variables description

The extant literature reviewed in the previous section reveals the conflicting nature of empirical findings on this subject. It seems to suggest also that the dynamics between financial development and economic growth might be country and/or time-specific (Nyasha & Odhiambo, 2018). The objective of this paper is to test those four propositions by using the Dumitrescu-Hurlin Granger non-causality test, and by adjusting the samples, to test the underlying conditions in which a causal relationship between the variables holds true. The sample will be divided to match explanations such as:

a) The relationship between financial development and economic growth depends on the country's income level; this specification might affect the direction of the causality, if one exists. Therefore, countries are divided, accordingly, by their income classification. The hypothesis here is that different levels of income require different institutional settings and, for example, financial development is more important for countries that have already reached some level of development (Demsetz, 2000; Huang & Lin, 2009; Rioja & Valev, 2004; Samargandi et al., 2015);

b) The relationship between financial development and economic growth depends on the competitiveness of the country; countries are split according to the 2017 Global Competitiveness Index™. A high level of competitiveness may require a more sophisticated financial system (Alomari et al., 2019; Fanelli & Medhora, 2002; Hsu et al., 2014);

c) The relationship between financial development and economic growth is affected by the law that enforces contracts. Contract enforcement is central to minimizing transaction costs, and to connect savers and investors. This will be addressed by dividing the sample between countries that follow the Common, Civil, and Islamic Laws (Levine, 1998; La Porta et al., 1997);

d) The relationship between financial development and economic growth is influenced by the new business entry rate, that is, the number of newly registered firms with limited liability per 1,000 working-age people per year. The new business entry rate works as a proxy for entrepreneurship activity, which requires a developed financial system as a facilitator of funds (Luigi et al., 2004; Schumpeter & Opie, 1934).

Data and the criteria to divide the countries into subgroups come from the World Development Indicators™, Global Entrepreneurship Index™, World Economic Forum, CIA World Factbook and La Porta et al. (1997). The period is from 1980 to 2017 (transitional economies were typically tested after 1990 due to data availability limitation). The new business entry rate was available for the last decade of the study only (early 2000s) and formed the basis to split the sample according to the explanation "d" above. One-hundred and eight countries were tested: Tables 1–4 presents their classifications with respect to income level, new business entry rate, the legal system, and competitiveness threshold.

However, most proxies for financial depth are available for a limited number of countries and time period only, which limits the scope of empirical tests. Considering that the objective of this article is to search for a common underlying factor for as many countries as possible for a longer time span, the only available variable that fits such requirements of time length and country scope is the commonly used domestic credit provided by the banking sector as percentage of GDP. This will be used as a proxy for financial development in this study.

To the best of our knowledge, studies with the previously mentioned split criteria, large sample size of up to 108 countries, and over such an extended period, are yet to be reported in the literature.

**Table 1. List of countries corroborating hypothesis 1 (H1) and classifications**

<b>Antigua</b> <sup>co,gc2t,er3,hi</sup>	<b>Gambia</b> <sup>is,gc1,li</sup>	<b>Netherlands</b> <sup>ci,gc3,er4,hi</sup>
Argentina <sup>ci,gc2t,er1,umi</sup>	Ghana <sup>gc1,er2,lmi</sup>	NewZealand <sup>co,gc3,er4,hi</sup>
Australia <sup>co,gc3,er4,hi</sup>	Greece <sup>ci,gc3,er2,hi</sup>	Nicaragua <sup>ci,gc1,lmi</sup>
Bangladesh <sup>gc1,er2,li</sup>	Guatemala <sup>gc2,er2,lmi</sup>	Nigeria <sup>gc1t,er2,lmi</sup>
Barbados <sup>co,gc2t,hi</sup>	Honduras <sup>ci,gc1t,lmi</sup>	Panama <sup>ci,gc2t,er4,umi</sup>
Belgium <sup>ci,gc3,er3,hi</sup>	Hong Kong <sup>gc3, er4, hi</sup>	Paraguay <sup>ci,gc2,lmi</sup>
Belize <sup>co, er3,umi</sup>	Israel <sup>gc2,er3,hi</sup>	Philippines <sup>gc1t,er1,lmi</sup>
Bhutan <sup>gc1t,er2,lmi</sup>	Kazakhstan <sup>ci,gc1t,er3,umi</sup>	Poland <sup>ci,gc2t,er1,hi</sup>
Bolivia <sup>ci,gcit,er2,lmi</sup>	Kenya <sup>gc1,er1,li</sup>	Qatar <sup>is,gc3,er3,hi</sup>
Brazil <sup>ci,gc2,er3,umi</sup>	Korea <sup>ci,gc3,er3,hi</sup>	Russia <sup>ci,gc1t,er4,hi</sup>
Bulgaria <sup>gc2,er3,umi</sup>	Kuwait <sup>is,gc1t,hi</sup>	SaudiArabia <sup>is,gc2t,hi</sup>
Canada <sup>co,gc3,er2,hi</sup>	Kyrgyz Rep. <sup>gc1,er2,lmi</sup>	Singapore <sup>co,gc3,er4,hi</sup>
Colombia <sup>ci,gc2,er2,umi</sup>	Luxembourg <sup>gc3, er4, hi</sup>	SlovakR <sup>ci,gc2t,er3,hi</sup>
Costa Rica <sup>ci,gc2t,er2,umi</sup>	Macedonia <sup>gc2, er4, umi</sup>	Sri Lanka <sup>gc2,er1,lmi</sup>
Croatia <sup>ci,gc2t,er3,umi</sup>	Malaysia <sup>gc2t,er3,umi</sup>	Switzerland <sup>ci,gc3,er3,hi</sup>
Cyprus <sup>gci3,er4,hi</sup>	Malta <sup>gc3,er4,hi</sup>	Trinidad&Tob <sup>co,gc3hi</sup>
Czech Rep. <sup>gc3,er3,hi</sup>	Mauritius <sup>gc2t,er4,umi</sup>	Turkey <sup>ci,gc2t,er2,umi</sup>
ElSalvador <sup>ci,gc2,er1,lmi</sup>	Moldova <sup>gc1,er3,lmi</sup>	UAE <sup>is,gc3,er2,hi</sup>
Lao <sup>gc1, er1, lmi</sup>	Montenegro <sup>gc2,er4,umi</sup>	Vietnam <sup>ci,gc1t,lmi</sup>
France <sup>ci,gc4,er3,hi</sup>	Namibia <sup>gc2,er2,umi</sup>	

**Table 2. List of countries corroborating hypothesis 2 (H2) and classifications**

<b>Azerbaijan</b> <sup>**ci,gc1,er3,umi</sup>	<b>Hungary</b> <sup>***ci,gc2t,er4,umi</sup>	<b>Peru</b> <sup>**ci,gc2,er3,umi</sup>
Bahrain <sup>***gc3,hi</sup>	Iceland <sup>***ci,gc3,er4,hi</sup>	Romania <sup>***ci,gc2,er4,umi</sup>
Benin <sup>**ci,gc1,li</sup>	India <sup>***gc1,er1,lmi</sup>	Serbia <sup>**gc2,umi</sup>
BosniaHer <sup>ci,gc2,er2,umi</sup>	Indonesia <sup>***is,gc2,er1,lmi</sup>	Suriname <sup>***ci,er2,umi</sup>
Botswana <sup>gc1t,er3,umi</sup>	Iran <sup>**is,gc2,umi</sup>	Sweden <sup>ci,gc3,er4,hi</sup>
Chile <sup>ci,gc2t,er3,hi</sup>	Lithuania <sup>gc2t,er3,hi</sup>	Ukraine <sup>ci,gc2,er2,lmi</sup>
Estonia <sup>***ci,gc3,er4,lmi</sup>	Malawi <sup>***gc1,er1,li</sup>	UK <sup>co,gc3,er4,hi</sup>
Germany <sup>***ci,gc3,er2,hi</sup>	Morocco <sup>***gc2,er2,lmi</sup>	

\* indicates significance at 10% level, \*\* at 5% level, \*\*\* and at 1% level according to the Z bar statistic ( $Z_{N,T}$ ) for Dumitrescu-Hurlin granger non-causality test.

#### 4. Methodology and analysis

Studies have evolved from cross-section to time series and panel data, which include a variety of data, proxies, periods, regions, and levels of aggregation: contradictory results are not uncommon (Nyasha & Odhiambo, 2018; Valickova et al., 2015). Country case studies are also common in the literature. The choice between running a granger non-causality VAR (vector autoregressive) or VECM (vector of error correction model) is not without controversy on the literature. Considering the need to test 180 countries with the model of choice, no restriction on the coefficients, the lag flexibility and that the models are bivariate only (domestic credit provided by the banking sector and GDP growth), a granger non-causality test was the model of choice (Bauer & Maynard, 2012; Clarke & Mirza, 2006; Toda & Yamamoto, 1995). Moreover, by controlling the financial depth to one variable and considering the



**Table 3. List of countries corroborating hypothesis 3 (H3) and classifications**

<b>Austria</b> **,ci,gc3,er2,hi	<b>Japan</b> ***,ci,gc3,er1,hi	<b>Slovenia</b> ***,ci,gc3,er3,hi
Cape Verde **, ci, lmi	Jordan **,gc2,er2,umi	SouthAfr. *,co,gc2,er2,umi
Denmark *,ci,gc3,er4,hi	Latvia ***,gc2t,er4,hi	USA ***,co,gc3,hi
Georgia ***,ci,gc2,er3,lmi	Mongolia *,gc1t,er4,lmi	Uruguay ***,ci,gc2t,er3,hi
Ireland ***,co,gc3,er4,hi	Norway **,ci,gc3,er4,hi	Venezuela *,ci,gc1t,umi
Italy ***,ci,gc3,er3,hi	Oman ***,is,gc2t,er2,hi	Zambia **,co,gc1,er2,lmi
Jamaica **,co,gc2,umi	Pakistan ***,is,gc1,er1lmi	

\* indicates significance at 10% level, \*\* at 5% level, \*\*\* and at 1% level according to the Z bar statistic ( $Z_{N,T}$ ) for Dumitrescu-Hurlin granger non-causality test

**Table 4. List of countries corroborating hypothesis 4 (H4) and classifications**

<b>Finland</b> ***/**,ci,gc3,er3,hi	<b>Portugal</b> ***/**,ci,gc3,er4,hi	<b>Thailand</b> ***/,gc2,er2,umi
Mexico ***/**,ci,gc2t,er2,umi	Spain ***/**,ci,gc3,er3,hi	Uganda ***/,co,gc1,er2,li

\* indicates significance at 10% level, \*\* at 5% level, \*\*\* and at 1% level according to the Z bar statistic ( $Z_{N,T}$ ) for Dumitrescu-Hurlin granger non-causality test. First asterisks indicates the level of statistical significance from economic growth to financial development, second the reverse causality significance

objective of testing as many countries as possible for a long time period, without losing country-specific features due to homogeneous aggregation, no cross-sectional dependency (though not a condition for strong results) the innovative Dumitrescu-Hurlin granger non-causality VAR test for heterogeneous panel data (Dumitrescu & Hurlin, 2012; Juodis et al., 2020; Zanella & Oyelere, 2020) fits well to achieve the objective of the paper.

The estimation model is:

$$gdp_{i,t} = \alpha_i + \sum_{k=1}^k \gamma_i^{(k)} gdp_{i,t-k} + \sum_{k=1}^k \beta_i^{(k)} dcr_{i,t-k} + \varepsilon_{it}$$

With  $K \in N$ . Where  $gdp$  is the GDP growth rate in logs,  $dcr$  is the domestic credit provided by the banking sector as percentage of GDP in first differences (stationary series),  $i$  stands for individual countries (1, ..., N). The null hypothesis corroborate the non-causality. Besides the non-causality between economic growth ( $gdp$ ) to financial development (proxied by  $dcr$ ), the other three possible results are unidirectional causality from  $gdp$  to  $dcr$ , unidirectional causality from  $dcr$  to  $gdp$ , and bicausality between  $gdp$  and  $dcr$ . Each country was tested for lag length based on Schwarz information criterion after running an unrestricted VAR,  $t$  indexes time (1, ..., T), and error terms  $\varepsilon$  are white noise. Unit root tests results were omitted for concision purposes considering the variables were tested individually for all 108 countries; all series are stationary. The model was tested in both causal directions (for an analysis on why time-series and cross-country studies, with a critique on why the latter may produce contradicting results, see Bloch & Kan Tang, 2003).

## 5. Results

Tables 1– 4 show the results of the granger causality test for all 108 countries that were divided by the respective hypothesis. Each country superscript identifies its legal system (Civil, Common, Islamic), stage of competitiveness (from factor to innovation-driven: the five stages followed the Global Competitiveness Index division), new business entry rate quartile and income level according to the World Bank classification. Where  $ci$  stands for Civil Law,  $co$  for Common Law,  $is$  for Islamic law;  $gc1$ ,

*gc1t*, *gc2*, *gc2t*, and *gc3* stand for Global Competitiveness Index stage one (factor-driven), transition to stage two, stage two (efficiency drive), transition to stage three, and stage three (innovation driven). *er1*, *er2*, *er3*, and *er4* stand for new business entry rate 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> quartiles, respectively *li*, *lmi*, *umi*, and *hi* stand World Bank classification of Lower, Lower-Middle, Upper-Middle, and Higher Income economies. Data on legal system, global competitiveness index, and new business entry rate were not available for a few countries as superscripts omission may indicate.

Tables 1– 4 above show that hypothesis 1 (H1: no statistically significant relationship between financial development and economic growth) is predominant among all 108 countries with 59 cases for the long run time span. Hypotheses 2 (H2: statistically significant relationship from economic growth to financial development) and three (H3: statistically significant relationship from financial development to economic growth) are corroborated by 20 and 23 countries, respectively The H4 hypothesis is the least corroborated with just six countries showing bi-causality.

5 summarizes the four hypotheses distributions (Tables Table 1–4) but now according to their corresponding classification or institutional cut. The percentage cell indicates which institutional category has the highest proportion for each hypothesis. Civil law predominates among countries corroborating the bi-causality, common law for countries showing causality running from financial development to economic growth, (which is similar to the findings of Ibrahim and Alagidede (2017), who investigated 33 sub-Sahara African countries), and Islamic law predominates among countries within the H2 hypothesis. Regarding global competitiveness: index stage three (*gc3*: innovation-driven) stands out with 50% of the H4 group of countries, but is closely followed by 40% of the countries composing the H3 (both hypotheses are closely supportive of Alomari et al.’s (2019) findings. New business entry rate 2<sup>nd</sup> quartile (*er2*) has the highest predominance on the group of countries composing H4 hypotheses. High-income countries show the highest share with 55% of the records of the H3 hypothesis of financial development to economic growth, similar to Yang (2019); diversely, Samargandi et al. (2015) found an inverted U-shaped relationship between finance and growth for middle-income countries. H2 shows mixed results regarding the institutional cut. H4 results should be read with caution because only six countries fell within this hypothesis, while for the legal system only five of them were possible to clearly identify with the predominant legal system.

H1 predominates in majority of cases, since the causality was not statistically significant in any direction. However, for those cases where a statistically significant causality exists, H3 (from

**Table 5. Hypotheses summary results by institutional classifications**

	CI	CO	IS	GC1	GC1T	GC2	GC2T	GC3	ER1 <sup>ST</sup>	ER2 <sup>ND</sup>	ER3 <sup>RD</sup>	ER4 <sup>TH</sup>	LI	LMI	UMI	HI
H1 %	23 38.9	8 13.6	5 8.4	8 13.5	8 <b>13.5</b>	11 18.6	12 <b>20.3</b>	15 25.4	7 11.8	14 23.7	16 27.1	13 22.0	3 5.0	15 <b>25.4</b>	14 23.7	27 45.7
H2 %	13 50.0	1 4.3	3 <b>13.0</b>	3 13.0	1 4.3	7 <b>30.4</b>	3 13.0	6 26.0	3 <b>13.0</b>	5 21.7	5 17.3	6 <b>26.0</b>	2 8.6	5 21.7	9 <b>39.1</b>	7 30.4
H3 %	10 50.0	5 <b>25.0</b>	2 10.0	2 10.0	2 10.0	4 20.0	3 15.0	8 40.0	2 10.0	5 25.0	4 20.0	5 25.0	0 0.0	5 25.0	4 20.0	11 <b>55.0</b>
H4 %	4 <b>66.6</b>	1 16.6	0 0.0	1 <b>16.6</b>	0 0.0	1 16.6	1 16.6	3 <b>50.0</b>	0 0.0	3 <b>50.0</b>	2 <b>33.3</b>	1 16.6	1 <b>16.6</b>	0 0.0	2 33.3	3 50.0
Σ	50	15	11	14	11	23	19	32	12	27	27	26	6	25	29	48

% stands for the percentage of the countries within an institutional category corroborating one of the 4 hypotheses.

financial development to economic growth) outweighs for countries with high income, competitiveness level classified as innovation-driven (the highest), and common law as the legal system.

## 6. Conclusion

This paper set out to investigate the relationship between economic growth and financial development under a particular set of conditions (income level, legal framework, competitiveness level, and entrepreneurship activity), by using a large sample of 108 countries over an extended period of time. Although a large body of literature on the relationship subsists, it is limited in time period and number of countries covered, and the literature often produce limited or contradictory results (Lawal et al., 2016; Valickova et al., 2015).

We found no statistically significant relationship between financial development and economic growth to be predominant, with 59 cases for the long run time span; while statistically significant relationships from economic growth to financial development, and from financial development to economic growth in 20 and 23 countries, respectively. Bicausality between financial development and economic growth is the least corroborated with six countries only.

The diverse nature of the results reported in Table 5 is evidence that the results of this study may be country-specific, and generalizations should be done with caution due to singular historical characteristics (Nyasha & Odhiambo, 2018; Rodrik, 2004; Woolcock et al., 2011; Zanella & Westley, 2015). Nonetheless, a particular pattern holds true when causality exists: it predominantly runs from financial development to economic growth (H3) to high-income countries, or countries with a high level of innovation which, in turn, correlated with countries with common law legal framework. Moreover, our study findings mainly corroborate Demsetz (2000) and Beck et al. (2003) (H1). Thus, policymakers of transitional and emerging economies, unlike those from high-income countries, should focus on the reasons why financial development is not yet a crucial factor for them, and perhaps address other influences that are initially more important such as legal framework, industrial policies, infrastructure, human capital (Bloch & Kan Tang, 2003), and others from the institutional literature (Agyemang et al., 2018). Moreover, developed countries policies, in times of recession, should not focus on the financial system for rebounding of economic growth, but perhaps focus on sectors related to the production of goods and non-financial services since the research evidence suggests that there is a higher payoff for the society.

Although this research addresses the relationship between financial development and economic growth in a unique way, some important limitations resulted from the trade-off between its broad approach and inclusiveness. First, the only variable available to proxy financial development for all countries/years was domestic credit provided by the banking sector as a percentage of GDP. This option is not inclusive of another important component of financial development, especially for developed economies, that is the stock market. Second, due to the uniqueness of this study in terms of the depth of the time window, we needed to use the available data to split the countries. For instance, while it was unlikely to see a country change its legal system from 1980 to 2017, it was possible to see variations in the Global Competitiveness Index or New Business Entry Rate from its early years to the latest ones; however, these data were not available for the entire time window, so if such variations occurred, it could not be observed. Third, from a broader institutional perspective, some additional dimensions could be explored in future studies. For instance, the New Business Entry rate could be explored further by distinguishing between high tech and traditional firms. Also, several other dimensions could be used, such as: trade openness, property rights enforcement, political system, federalism, government budget overall status, and so on. All these additional features would certainly provide richer and more comprehensive insights in terms of public policies and their impact on the society.

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