The Depth of the Financial System: A Comparison of Developed and Less Developed Countries

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Abstract

This paper summarizes the arguments and counterarguments within the scientific discussion on the issue of how countries' income levels are related to the depth of their financial system. The main purpose of the research is to determine whether high-income countries have deeper financial systems when compared to other countries. We also examine whether high-income OECD member countries have a deeper financial system when compared to high-income non-OECD member countries. Our contribution is threefold: First, our study has a wider scope than most of the previous studies (i.e. 203 countries in total). Second, we examine both the impact of OECD membership and the actual income level on "depth". The OECD members and the non-members differ in terms of their cultures, their resources and their infrastructure, therefore we expect differences between their financial systems. Third, our study goes deeper than most of the previous studies (i.e. we examine twenty different variables on "depth"). The examination of several variables on "depth" allows us to see the dimensions in which one group of countries perform better than the other group. While one group can perform better in certain dimensions of "depth", the other group can perform better in other dimensions of "depth". In our empirical analyses, we find that high-income countries tend to have a deeper financial system (in all measures except for "Central bank assets to GDP (%)") when compared to other countries. When we compare high-income OECD-member countries to high-income non-OECD-member countries, we find that OECD-member countries tend to have a deeper financial system (in most measures). Interestingly, with respect to two measures, non-OECD-member countries have better "depth" measures. These two measures are "Stock market total value traded to GDP (%)" and "Gross portfolio debt assets to GDP (%)". Overall, our results indicate that when an economic or financial crisis is expected, middle and low-income countries will be more vulnerable when compared to high-income countries, because in most aspects, their markets are not as deep. On the other hand, high-income countries will be more vulnerable if their Central bank needs to use their assets to protect their system. Similarly, non-OECD members will be more vulnerable when compared to OECD-member countries, because in most aspects, their markets are not as deep. On the other hand, OECD-member countries are weaker with regard to the depth of their stock markets and the amount of debt securities held in investment portfolios. Therefore, we can conclude that a country's income level and OECD-membership should help determine the precautions that policymakers need to take if a crisis is on the horizon.

Keywords: depth, financial system, OECD, income level.

Introduction

In this study, we examine the relation between countries' income levels and the "depth" of their financial system. First, we look at how OECD membership affects the "depth" of a country's financial system. For this purpose, we compare "depth" measures in high-income OECD-member countries and in high-income non-OECD-member countries. Next, we examine how the actual income level of countries affect the "depth" of their financial system. We compare high-income countries to other countries (i.e. low- and middle-income countries).

We use World Bank's Global Financial Development Database (i.e. GFDD) which has information on countries' "depth" variables. As measures of depth, we use twenty different variables. These variables include items that are related to banking system, insurance system, stock market, outstanding depth levels, and investments. The previous studies on the relationship between economic development and financial development have mixed results. While some of these studies like Bagehot (1873), Schumpeter (1912), Hicks (1969), and King and Levine (1993) argue that the services provided by financial intermediaries are essential drivers for innovation and growth, other studies like Robinson (1952), argue that economic growth causes a higher demand for financial services, and as a result, financial development follows economic growth.

In this current paper, we make a contribution to the literature in three ways: First, our study has a wider scope than most of the previous studies. Our dataset includes all of the countries in World Bank's dataset (i.e. 203 countries in total). Second, we examine both the impact of OECD membership and the actual income level on "depth". The OECD members and the non-members differ in terms of their cultures, their resources and their infrastructure. Therefore, even countries that have similar GDPs are very different. The comparison of the OECD members and the non-members will shed a new light on how these factors (i.e. mainly culture, resources and infrastructure) affect the "depth" of a financial system. Third, our study goes deeper than most of the previous studies. We examine twenty different variables on "depth", and as explained above, they include items that are related to different parts of the financial system (i.e. banking system, insurance system, stock market, outstanding depth levels, and investments). The paper continues as follows: Section 2 summarizes the previous literature; Section 3 states the hypotheses. Section 4 describes the data and the methodology; Section 5 shows the empirical results; and Section 6 concludes.

1. Literature Review

The previous studies on the relationship between economic development and financial development have mixed results. Most of the earlier studies argue that financial development leads to economic development. Bagehot (1873) argue that financial development played a critical role in igniting industrialization in England. According to Schumpeter (1912), a well-developed financial system channels financial resources to the most productive use. Hicks (1969) supports these papers by stating that financial development leads economic growth. Using data on 80 countries over the 1960-1989 period, King and Levine (1993) present evidence that supports the notion that the financial system can promote economic growth. According to the authors, financial development is strongly associated with real per capita GDP growth, the rate of physical capital accumulation, and improvements in the efficiency. McKinnon (1973), Shaw (1973), Fry (1988), and Pagano (1993) also examine the relationship between economic and financial development. Khan and Semlali (2000) provide an overview of the literature on financial depth and growth. Robinson (1952), on the other hand, argues that financial development does not cause an impact on growth. The author argues that financial development follows economic growth as a result of higher demand for financial services. Economic growth creates a new demand for particular financial services/products, and the financial system responds accordingly by creating those services/products. Ang and McKibbin (2007) examine the relationship between financial development and economic growth in Malaysia. In order to determine the direction of the causal relationship between economic growth and financial development, they run cointegration and causality tests for the 1960-2001 period. In their tests, they take the real interest rate and financial repression into account. They show that financial depth and economic development are positively related. However, their results support Robinson's view that output growth leads to higher financial depth in the long-run. Odhiambo (2008) examines the dynamic causal relationship between financial depth and economic growth in Kenya. The author includes savings as an intermitting variable. The results support a uni-directional causal flow from economic growth to financial development. Economic growth Granger causes savings, while savings drive the development of the financial sector in Kenya. Other studies show that the causal relationship between economic growth and financial development is not so clear. Demetriades and Hussein (1996) run causality tests for 16 developing countries. They find that causality between financial development and growth varies across countries. While in about half the countries examined, there is a feedback relationship, in several countries the relationship runs from growth to finance. Arestis and Demetriades (1997) examine the relationship between financial development and economic growth. They argue that the results obtained from cross-country regressions may not accurately reflect individual country circumstances (i.e. the policy regime, the institutional structure of the financial system, and the degree of effective governance). They find that the results exhibit substantial variation across countries. Klein and Olivei (1999) examine the 1986-1995 period and find that developed countries

with open capital accounts had a significantly greater increase in financial depth compared to other countries. They also enjoyed greater economic growth. For developing countries, opening up the capital account do not promote financial deepness. Levine (1999) argue that since Goldsmith (1969) documented the relationship between financial and economic development, the researchers has made important progress. However, it is still not clear whether economic development leads financial development or vice versa. Arestis and Demetriades (1999) show that the causal link between finance and growth depends on the operation and nature of the financial institutions and policies pursued in each country. Khan, Semlali, and Smith (2001) examine the notion that inflation impedes financial deepening. Using a large cross-country sample, Khan, Semlali, and Smith (2001) show that if inflation is less than a threshold of generally 3-6 percent per year (depending on the financial depth measure used), it has a positive effect on financial depth. If it is more than that threshold, the effect turns negative. In addition to the above studies that show (1) finance leads economic growth, (2) economic growth leads finance, or (3) it can be in both directions depending on the situation, there are yet other studies that imply that the finance-growth relationship is unimportant. Lucas (1988) argues that economists "badly over-stress" the role of financial factors in economic growth. Chandavarkar (1992) and Stern (1989) ignore the role of the financial system in economic development.

The next section explains our hypotheses.

2. Hypotheses

We expect high-income countries' financial systems to be deeper than those of other countries. Due to the reasons explained above, we also expect high-income OECD member countries' financial systems to be deeper than those of non-OECD member countries.

Therefore, our formal hypotheses are as follows:

Hypothesis 1: High-income countries' financial systems are deeper compared to other countries' financial systems.

Hypothesis 2: High-income OECD member countries' financial systems are deeper compared to high-income non-OECD member countries' financial systems.

Table 1-Panel A shows that, for each depth measure, we expect the High-Income OECD countries to have higher values when compared to the High-Income Non-OECD countries.

Panel B shows that, for each depth measure, we expect the High-Income countries (including the Non-OECD countries) to have higher values when compared to the other countries.

Table 1. The Expected Results of the Comparisons

Panel A. High-Income OECD vs High-Income Non-OECD		
Variable	**OECD**	**Non-OECD**
Bank private credit to GDP (%)	X	
Deposit money bank assets to GDP (%)	X	
DMBA to DMBA and central bank assets (%)	X	
Liquid liabilities to GDP (%)	X	
Central bank assets to GDP (%)	X	
Financial system deposits to GDP (%)	X	
Life insurance premium volume to GDP (%)	X	
Non-Life insurance premium volume to GDP (%)	X	
Pr. credit by deposit money banks and other fin. Inst. to GDP (%)	X	
Stock market capitalization to GDP (%)	X	
Stock market total value traded to GDP (%)	X	
Outstanding domestic private debt securities to GDP (%)	X	
Outstanding domestic public debt securities to GDP (%)	X	
Outstanding international private debt securities to GDP (%)	X	
Outstanding international public debt securities to GDP (%)	X	
International debt issues to GDP (%)	X	
Gross portfolio equity liabilities to GDP (%)	X	
Gross portfolio equity assets to GDP (%)	X	
Gross portfolio debt liabilities to GDP (%)	X	
Gross portfolio debt assets to GDP (%)	X	
Panel B. High-Income vs Other		
Variable	**High-Income**	**Other**
Bank private credit to GDP (%)	X	
Deposit money bank assets to GDP (%)	X	
DMBA to DMBA and central bank assets (%)	X	
Liquid liabilities to GDP (%)	X	

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Table 1 (cont.). The Expected Results of the Comparisons

Central bank assets to GDP (%)	X	
Financial system deposits to GDP (%)	X	
Life insurance premium volume to GDP (%)	X	
Non-Life insurance premium volume to GDP (%)	X	
Pr. credit by deposit money banks and other fin. Inst. to GDP (%)	X	
Stock market capitalization to GDP (%)	X	
Stock market total value traded to GDP (%)	X	
Outstanding domestic private debt securities to GDP (%)	X	
Outstanding domestic public debt securities to GDP (%)	X	
Outstanding international private debt securities to GDP (%)	X	
Outstanding international public debt securities to GDP (%)	X	
International debt issues to GDP (%)	X	
Gross portfolio equity liabilities to GDP (%)	X	
Gross portfolio equity assets to GDP (%)	X	
Gross portfolio debt liabilities to GDP (%)	X	
Gross portfolio debt assets to GDP (%)	X	

Source: compiled by the author.

3. Data and Methodology

In this study, as measures of depth, we use twenty variables. These are listed below with their sources explained in parenthesis. We actually collected the data from World Bank's Global Financial Development Database (GFDD) which has information on access to finance, and depth, efficiency, and stability of financial systems in the world. World Bank collected these data from different sources. Here, we show the original source of each variable. All of the variables and their definitions are taken from World Bank's Global Financial Development Database.

Below are the "depth" measures that we are using in this study (as described by the database):

"Bank private credit to GDP (%): The financial resources provided to the private sector by domestic money banks as a share of GDP. Domestic money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits. (International Monetary Fund, International Financial Statistics, and World Bank GDP estimates)

Deposit money bank assets to GDP (%): Total assets held by deposit money banks as a share of GDP. Assets include claims on domestic real nonfinancial sector which includes central, state and local governments, nonfinancial public enterprises and private sector. Deposit money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits. (International Monetary Fund, International Financial Statistics, and World Bank GDP estimates)

DMBA to DMBA and central bank assets (%): Total assets held by deposit money banks as a share of sum of deposit money bank and Central Bank claims on domestic nonfinancial real sector. Assets include claims on domestic real nonfinancial sector which includes central, state and local governments, nonfinancial public enterprises and private sector. Deposit money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits. (International Monetary Fund, International Financial Statistics)

Liquid liabilities to GDP (%): Ratio of liquid liabilities to GDP. Liquid liabilities are also known as broad money, or M3. They are the sum of currency and deposits in the central bank (M0), plus transferable deposits and electronic currency (M1), plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements (M2), plus travelers checks, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents. (International Monetary Fund, International Financial Statistics, and World Bank GDP estimates)

Central bank assets to GDP (%): Ratio of central bank assets to GDP. Central bank assets are claims on domestic real nonfinancial sector by the Central Bank. (International Monetary Fund, International Financial Statistics, and World Bank GDP estimates)

Financial system deposits to GDP (%): Demand, time and saving deposits in deposit money banks and other financial institutions as a share of GDP. (International Monetary Fund, International Financial Statistics, and World Bank GDP estimates)

Life insurance premium volume to GDP (%): Ratio of life insurance premium volume to GDP. Premium volume is the insurer's direct premiums earned (if Property/Casualty) or received (if Life/Health) during the previous calendar year. (Swiss Re, Sigma Reports)

Non-Life insurance premium volume to GDP (%): Ratio of non-Life insurance premium volume to GDP. Premium volume is the insurer's direct premiums earned (if Property/Casualty) or received (if Life/Health) during the previous calendar year. (Swiss Re, Sigma Reports)

Pr. credit by deposit money banks and other fin. Inst. to GDP (%): Private credit by deposit money banks and other financial institutions to GDP. (International Monetary Fund, International Financial Statistics)

Stock market capitalization to GDP (%): Total value of all listed shares in a stock market as a percentage of GDP. (Standard & Poor's, Global Stock Markets Factbook and supplemental S&P data)

Stock market total value traded to GDP (%): Total value of all traded shares in a stock market exchange as a percentage of GDP. (Standard & Poor's, Global Stock Markets Factbook and supplemental S&P data)

Outstanding domestic private debt securities to GDP (%): Total amount of domestic private debt securities (amount outstanding) issued in domestic markets as a share of GDP. It covers data on long-term bonds and notes, commercial paper and other short-term notes. (Bank for International Settlements)

Outstanding domestic public debt securities to GDP (%): Total amount of domestic public debt securities (amount outstanding) issued in domestic markets as a share of GDP. It covers long-term bonds and notes, treasury bills, commercial paper and other short-term notes. (Bank for International Settlements)

Outstanding international private debt securities to GDP (%): Amount of private international debt securities (amount outstanding), as a share of GDP. It covers long-term bonds and notes and money market instruments placed on international markets. (Bank for International Settlements)

Outstanding international public debt securities to GDP (%): Amount of public international debt securities (amount outstanding), as a share of GDP. It covers long-term bonds and notes and money market instruments placed on international markets. (Bank for International Settlements)

International debt issues to GDP (%): Total value of outstanding international debt issues both public and private, as a share of GDP. (Bank for International Settlements)

Gross portfolio equity liabilities to GDP (%): Ratio of gross portfolio equity liabilities to GDP. Equity liabilities include shares, stocks, participation, and similar documents (such as American depository receipts) that usually denote ownership of equity. (International Monetary Fund, International Financial Statistics)

Gross portfolio equity assets to GDP (%): Ratio of gross portfolio equity assets to GDP. Equity assets include shares, stocks, participation, and similar documents (such as American depository receipts) that usually denote ownership of equity. (International Monetary Fund, International Financial Statistics)

Gross portfolio debt liabilities to GDP (%): Ratio of gross portfolio debt liabilities to GDP. Debt liabilities cover (1) bonds, debentures, notes, etc., and (2) money market or negotiable debt instruments. (International Monetary Fund, International Financial Statistics)

Gross portfolio debt assets to GDP (%): Ratio of gross portfolio debt assets to GDP. (International Monetary Fund, International Financial Statistics)"

There are 203 countries in the sample. 31 countries are High-Income OECD countries, 29 countries are High-Income Non-OECD countries, 108 countries are Middle-Income countries, and 35 countries are Low-Income countries.

In order to compare the High-Income countries to the Other countries and also to compare the High-Income OECD countries to the High-Income Non-OECD countries, we use the Mann-Whitney-Wilcoxon test in the following section.

4. Empirical Results

Table 2 shows the summary statistics for the High-Income OECD Countries. Table 3 shows the summary statistics for the High-Income Non-OECD Countries. We are seeing that, for most of the variables, the High-Income OECD countries have higher values compared to the High-Income Non-OECD countries. In terms of fifteen variables, the High-Income OECD countries have higher values when compared to the High-Income

Non-OECD countries. In terms of two variables (i.e. "DMBA to DMBA and central bank assets (%)" and "Central bank assets to GDP (%)"), the two groups of countries have similar values. Only in three measures, the High-Income Non-OECD countries have higher values. These three measures are "Stock market capitalization to GDP (%)", "Stock market total value traded to GDP (%)", and "Gross portfolio debt assets to GDP (%)".

Table 2. Depth of the Financial System in High-Income OECD Countries

Variable	Mean	StD	Min.	Max.
Bank private credit to GDP (%)	126.27	48.22	48.24	208.97
Deposit money bank assets to GDP (%)	120.79	68.74	9.44	236.32
DMBA to DMBA and central bank assets (%)	97.36	4.71	79.21	99.96
Liquid liabilities to GDP (%)	115.34	60.54	55.06	330.60
Central bank assets to GDP (%)	3.08	4.90	0.03	18.52
Financial system deposits to GDP (%)	100.46	59.75	44.80	325.18
Life insurance premium volume to GDP (%)	3.20	1.95	0.40	7.16
Non-Life insurance premium volume to GDP (%)	2.13	0.94	1.09	5.26
Pr. credit by deposit money banks and other fin. Inst. to GDP (%)	135.10	47.81	48.24	208.97
Stock market capitalization to GDP (%)	60.84	46.01	4.78	179.48
Stock market total value traded to GDP (%)	53.56	53.98	0.26	205.58
Outstanding domestic private debt securities to GDP (%)	45.08	38.55	2.07	181.31
Outstanding domestic public debt securities to GDP (%)	47.73	39.42	0.01	218.85
Outstanding international private debt securities to GDP (%)	67.21	65.70	0.47	261.18
Outstanding international public debt securities to GDP (%)	13.43	15.37	0.04	73.93
International debt issues to GDP (%)	80.64	69.83	2.86	281.38
Gross portfolio equity liabilities to GDP (%)	19.39	20.68	0.49	92.94
Gross portfolio equity assets to GDP (%)	33.47	50.66	1.31	255.98
Gross portfolio debt liabilities to GDP (%)	67.19	67.27	10.82	341.03
Gross portfolio debt assets to GDP (%)	37.68	29.65	0.70	99.06

Source: compiled by the author.

Table 3. Depth of the Financial System in High-Income Non-OECD Countries

Variable	Mean	StD	Min.	Max.
Bank private credit to GDP (%)	80.48	73.37	6.64	288.11
Deposit money bank assets to GDP (%)	96.71	82.24	6.95	315.49
DMBA to DMBA and central bank assets (%)	97.81	2.62	91.49	99.99
Liquid liabilities to GDP (%)	102.15	87.08	11.45	313.69
Central bank assets to GDP (%)	3.09	3.24	0.00	8.48
Financial system deposits to GDP (%)	92.73	82.85	9.33	301.63
Life insurance premium volume to GDP (%)	2.55	3.19	0.09	10.49
Non-Life insurance premium volume to GDP (%)	1.42	1.10	0.27	4.30
Pr. credit by deposit money banks and other fin. Inst. to GDP (%)	82.02	72.72	6.64	288.11
Stock market capitalization to GDP (%)	89.19	104.43	20.46	396.84
Stock market total value traded to GDP (%)	70.03	180.46	0.43	633.30
Outstanding domestic private debt securities to GDP (%)	10.85	4.07	7.27	15.28
Outstanding domestic public debt securities to GDP (%)	36.43	18.57	18.23	62.72
Outstanding international private debt securities to GDP (%)	19.70	13.62	3.01	41.68
Outstanding international public debt securities to GDP (%)	9.36	8.94	0.59	28.07
International debt issues to GDP (%)	29.06	19.17	12.38	69.75
Gross portfolio equity liabilities to GDP (%)	32.55	58.96	1.23	137.25
Gross portfolio equity assets to GDP (%)	51.46	80.46	2.51	193.13
Gross portfolio debt liabilities to GDP (%)	20.99	15.78	4.72	40.85
Gross portfolio debt assets to GDP (%)	118.37	83.79	3.48	233.64

Source: compiled by the author.

Table 4 shows the results of the Mann-Whitney-Wilcoxon tests that compare the two groups' depth measures. In terms of eleven measures, the High-Income OECD countries have significantly higher values compared to the High-Income Non-OECD countries. In the table, these higher values are shown in bold letters.

In terms of "Bank private credit to GDP (%)" and "Deposit money bank assets to GDP (%)", the High-Income OECD countries have significantly higher values when compared to the High-Income Non-OECD countries. The mean value of "Bank private credit to GDP (%)" is 126.27% for High-Income OECD countries, while it is 80.48% for High-Income Non-OECD countries (p-value of the difference=0.0019). The mean value of "Deposit money bank assets to GDP (%)" is 120.79% for High-Income OECD countries, while it is 96.71% for High-Income Non-OECD countries (p-value of the difference=0.0680).

Table 4. Depth of the Financial System in High-Income OECD vs. Non-OECD Countries

Variable	OECD	Non-OECD	p-value
Bank private credit to GDP (%)	**126.27**	80.48	0.0019
Deposit money bank assets to GDP (%)	**120.79**	96.71	0.0680
DMBA to DMBA and central bank assets (%)	97.36	97.81	0.4788
Liquid liabilities to GDP (%)	**115.34**	102.15	0.0337
Central bank assets to GDP (%)	3.08	3.09	0.4863
Financial system deposits to GDP (%)	**100.46**	92.73	0.0782
Life insurance premium volume to GDP (%)	**3.20**	2.55	0.0584
Non-Life insurance premium volume to GDP (%)	**2.13**	1.42	0.0026
Pr. credit by dep. money banks and other fin. Inst. to GDP (%)	**135.10**	82.02	0.0011
Stock market capitalization to GDP (%)	60.84	89.19	0.2303
Stock market total value traded to GDP (%)	53.56	**70.03**	0.0386
Outstanding domestic private debt securities to GDP (%)	**45.08**	10.85	0.0442
Outstanding domestic public debt securities to GDP (%)	47.73	36.43	0.2652
Outstanding international private debt securities to GDP (%)	**67.21**	19.70	0.0312
Outstanding international public debt securities to GDP (%)	13.43	9.36	0.3910
International debt issues to GDP (%)	**80.64**	29.06	0.0242
Gross portfolio equity liabilities to GDP (%)	19.39	32.55	0.1867
Gross portfolio equity assets to GDP (%)	33.47	51.46	0.4893
Gross portfolio debt liabilities to GDP (%)	**67.19**	20.99	0.0148
Gross portfolio debt assets to GDP (%)	37.68	**118.37**	0.0198

Source: compiled by the author.

Also, in terms of "Liquid liabilities to GDP (%)" and "Financial system deposits to GDP (%)", the High-Income OECD countries have significantly higher values. The mean value of "Liquid liabilities to GDP (%)" is 115.34% for High-Income OECD countries, while it is 102.15% for High-Income Non-OECD countries (p-value of the difference=0.0337). The mean value of "Financial system deposits to GDP (%)" is 100.46% for High-Income OECD countries, while it is 92.73% for High-Income Non-OECD countries (p-value of the difference=0.0782). In terms of "Life insurance premium volume to GDP (%)" and "Non-Life insurance premium volume to GDP (%)", the High-Income OECD countries have significantly higher values when compared to the High-Income Non-OECD countries. The mean value of "Life insurance premium volume to GDP (%)" is 3.20% for High-Income OECD countries, while it is 2.55% for High-Income Non-OECD countries (p-value of the difference=0.0584). The mean value of "Non-Life insurance premium volume to GDP (%)" is 2.13% for High-Income OECD countries, while it is 1.42% for High-Income Non-OECD countries (p-value of the difference=0.0026).

The High-Income OECD countries also have significantly higher values in terms of "Pr. credit by dep. money banks and other fin. Inst. to GDP (%)". While the mean value for this measure is 135.10% for the High-Income OECD countries, the corresponding value is 82.02% for the High-Income Non-OECD countries. Also, in terms of "Outstanding domestic private debt securities to GDP (%)" and "Outstanding international private debt securities to GDP (%)", the High-Income OECD countries have significantly higher values. The mean value of "Outstanding domestic private debt securities to GDP (%)" is 45.08% for High-Income OECD countries, while it is 10.85% for High-Income Non-OECD countries (p-value of the difference=0.0442). The mean value of "Outstanding international private debt securities to GDP (%)" is 67.21% for High-Income OECD countries, while it is 19.70% for High-Income Non-OECD countries (p-value of the difference=0.0312). Finally, in terms of "International debt issues to GDP (%)" and "Gross portfolio debt liabilities to GDP (%)", the High-Income OECD countries have significantly higher values. The mean value of "International debt issues to GDP (%)" is 80.64% for High-Income OECD countries, while it is 29.06% for High-Income Non-OECD countries (p-value of the difference=0.0242). The mean value of "Gross portfolio debt liabilities to GDP (%)" is 67.19% for High-Income OECD countries, while it is 20.99% for High-Income Non-OECD countries (p-value of the difference=0.0148).

Table 5 shows the summary statistics for the Low-Income Countries. For five measures, the data are very limited, therefore we exclude those variables. Table 6 shows the summary statistics for the Middle-Income Countries.

Table 5. Depth of the Financial System in Low-Income Countries

Variable	Mean	StD	Min.	Max.
Bank private credit to GDP (%)	18.54	11.13	5.34	49.96
Deposit money bank assets to GDP (%)	24.01	14.58	6.76	62.55
DMBA to DMBA and central bank assets (%)	74.72	19.42	35.09	99.44

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Table 5 (cont.). Depth of the Financial System in Low-Income Countries

Liquid liabilities to GDP (%)	35.21	13.26	14.29	69.88
Central bank assets to GDP (%)	7.17	7.46	0.55	30.19
Financial system deposits to GDP (%)	26.70	12.55	6.57	58.68
Life insurance premium volume to GDP (%)	0.23	0.37	0.01	0.88
Non-Life insurance premium volume to GDP (%)	0.51	0.26	0.15	0.95
Pr. credit by deposit money banks and other fin. Inst. to GDP (%)	18.64	11.12	5.34	49.96
Stock market capitalization to GDP (%)	19.25	11.84	2.09	35.35
Stock market total value traded to GDP (%)	3.11	5.68	0.11	14.52
Outstanding domestic private debt securities to GDP (%)	.	.	.	.
Outstanding domestic public debt securities to GDP (%)	.	.	.	.
Outstanding international private debt securities to GDP (%)	.	.	.	.
Outstanding international public debt securities to GDP (%)	.	.	.	.
International debt issues to GDP (%)	.	.	.	.
Gross portfolio equity liabilities to GDP (%)	0.28	0.40	0.04	0.99
Gross portfolio equity assets to GDP (%)	0.93	1.58	0.00	2.75
Gross portfolio debt liabilities to GDP (%)	0.28	0.47	0.01	0.98
Gross portfolio debt assets to GDP (%)	2.16	2.59	0.02	5.71

Source: compiled by the author.

Table 6. Depth of the Financial System in Middle-Income Countries

Variable	Mean	StD	Min.	Max.
Bank private credit to GDP (%)	41.60	26.22	4.41	121.49
Deposit money bank assets to GDP (%)	50.46	32.31	3.72	134.53
DMBA to DMBA and central bank assets (%)	90.29	10.89	52.40	100.00
Liquid liabilities to GDP (%)	57.15	33.44	5.37	206.12
Central bank assets to GDP (%)	4.59	5.96	0.00	33.14
Financial system deposits to GDP (%)	46.85	29.74	4.83	199.71
Life insurance premium volume to GDP (%)	0.89	1.58	0.00	9.61
Non-Life insurance premium volume to GDP (%)	1.03	0.56	0.19	2.76
Pr. credit by deposit money banks and other fin. Inst. to GDP (%)	43.92	29.13	4.52	141.41
Stock market capitalization to GDP (%)	40.72	41.72	0.35	232.41
Stock market total value traded to GDP (%)	12.75	24.00	0.01	112.44
Outstanding domestic private debt securities to GDP (%)	12.75	15.50	0.56	58.09
Outstanding domestic public debt securities to GDP (%)	28.42	17.18	4.27	70.21
Outstanding international private debt securities to GDP (%)	4.61	6.32	0.21	32.60
Outstanding international public debt securities to GDP (%)	7.83	10.18	0.09	57.14
International debt issues to GDP (%)	10.64	12.06	0.73	59.21
Gross portfolio equity liabilities to GDP (%)	4.43	6.45	0.04	25.47
Gross portfolio equity assets to GDP (%)	2.84	6.48	0.01	30.33
Gross portfolio debt liabilities to GDP (%)	8.97	16.88	0.00	106.18
Gross portfolio debt assets to GDP (%)	3.82	6.72	0.00	34.12

Source: compiled by the author.

Next, in order to see the relation between countries' income levels and the depth of their financial system, we compare the High-Income countries (including both OECD and Non-OECD countries) and the other countries (which includes Low-Income and Middle-Income countries). Table 7 shows the results of the Mann-Whitney-Wilcoxon tests that compare the two groups' depth measures. Out of the twenty measures, in nineteen of them, the High-Income countries have significantly higher values compared to the other countries. The Low- and Middle-Income countries have a higher mean value in only one measure. This measure is "Central bank assets to GDP (%)". In other words, except for the "Central bank assets to GDP (%)" variable, the High-Income countries have significantly higher values in all "depth" measures.

Table 7. Depth of the Financial System in High-Income vs. Other Countries

Variable	High-Income	Other	p-value
Bank private credit to GDP (%)	**108.19**	36.50	<0.0001
Deposit money bank assets to GDP (%)	**112.39**	44.76	<0.0001
DMBA to DMBA and central bank assets (%)	**97.50**	86.63	<0.0001
Liquid liabilities to GDP (%)	**110.72**	52.42	<0.0001
Central bank assets to GDP (%)	3.09	**5.20**	0.0062
Financial system deposits to GDP (%)	**97.70**	42.50	<0.0001
Life insurance premium volume to GDP (%)	**3.01**	0.84	<0.0001
Non-Life insurance premium volume to GDP (%)	**1.93**	0.98	<0.0001
Pr. credit by dep. money banks and other fin. Inst. to GDP (%)	**114.15**	38.32	<0.0001
Stock market capitalization to GDP (%)	**68.94**	38.26	0.0008

Table 7 (cont.). Depth of the Financial System in High-Income vs. Other Countries

Stock market total value traded to GDP (%)	**58.27**	11.75	<0.0001
Outstanding domestic private debt securities to GDP (%)	**41.77**	12.75	0.0008
Outstanding domestic public debt securities to GDP (%)	**46.02**	28.42	0.0166
Outstanding international private debt securities to GDP (%)	**56.93**	4.61	<0.0001
Outstanding international public debt securities to GDP (%)	**12.55**	7.83	0.0455
International debt issues to GDP (%)	**69.49**	10.64	<0.0001
Gross portfolio equity liabilities to GDP (%)	**21.58**	3.93	<0.0001
Gross portfolio equity assets to GDP (%)	**36.37**	2.71	<0.0001
Gross portfolio debt liabilities to GDP (%)	**59.74**	8.21	<0.0001
Gross portfolio debt assets to GDP (%)	**51.13**	3.67	<0.0001

Source: compiled by the author.

Conclusion

In this study, we examine two issues. First, we look at the relation between countries' income levels and the depth of their financial system. Do richer countries have deeper financial systems when compared to other countries? Then, we look at how OECD membership affects the depth of a country's financial system.

This is a study that analyzes the "depth" of countries' financial systems in detail. As measures of depth, we use twenty variables. These variables are collected from World Bank's Global Financial Development Database (GFDD).

Our results show that high-income OECD-member countries tend to have a deeper financial system when compared to high-income Non-OECD-member countries. When we compare high-income OECD-member countries to high-income Non-OECD-member countries, we find that OECD-member countries tend to have a significantly deeper financial system in 11 measures. Interestingly, with respect to two measures, Non-OECD-member countries have better "depth" measures. These two measures are "Stock market total value traded to GDP (%)" and "Gross portfolio debt assets to GDP (%)".

When we compare high-income countries to middle- and low-income countries, we find that high-income countries tend to have a deeper financial system (in all measures except for "Central bank assets to GDP (%)") when compared to other countries.

According to our findings, when an economic or financial crisis is expected, since middle and low-income countries' markets are not as deep, we expect them to be more vulnerable when compared to high-income countries. High-income countries, on the other hand, may have problems if their Central Bank needs to act. Similarly, non-OECD members will be more vulnerable in most aspects when compared to OECD member countries. OECD member countries, when compared to non-OECD member countries, may have more problems in their stock markets. We conclude that policymakers in each respective group need to consider these factors when devising their strategies against any expected crisis.

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