

Conceptualising the Linkages between Financial Development, Human Development, and Income Inequality: Cross-Country Evidences

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Abstract

In the present era of finance capitalism, it is a great challenge for any country to strengthen its financial sector so as to realise the vision of financial inclusive society. Beside this major challenge, the government has to ensure the well-being of the society. Well-being of the society is not only indicated by the income level of an individual, but also by the noneconomic factors like health and education level of the people. But now-a-days, more and more emphasis is given on the concept of well-being of the population in the context of limiting role of GDP in ensuring equitable distribution of wealth. Formulation of a policy in achieving both the policy objectives (i.e., development of financial sector and ensuring well-being of the population) essentially calls for an understanding on the linkages between financial development and well-being of the population. In this context, this paper attempts to develop a conceptual framework on the linkages between the financial development and the human well-being in the context of inclusive development paradigm. In addition, this paper also tries to conceptualise the theoretical framework on the implications of financial development and/or human well-being on the level of income inequality or the other way round. The empirical analysis in this paper shows that there is positive and significant bidirectional relationship between the financial development and human development across selected countries of the world. Government intervention in the development in the financial sector (or achieving a higher level of well-being of the population) can also reduce the extent of inequality in the distribution of income.

Keywords: Financial Development, Human Development, Income Inequality, Well-Being

JEL Classification: G20, I31, O15

Introduction

In the process of financial development, it is a great challenge for any country to tap the huge unexplored section of the population under the formal financial system¹ (popularly known as Financial Inclusion²). Besides this major challenge, the government has to promote the well-being of the society. Well-being of the society is not only indicated by the income level of the individuals, but also by the noneconomic factors like health and education level of the people. Following the capabilities approach of Amartya Sen, the human well-being does not depend on the possession of the resources, but on the conversion of those resources into functioning which is determined by the personal, social, and environmental factors (Sen, 1985). The concept of Human Development Index (HDI) emerges as a result of that new approach (UNDP, 1990).

Financial development often correlates with the well-being of the population. In the existing literature, the relationship can be explained by the supply-leading and demand-following hypothesis in practice (Patrick, 1966). As financial development provides supply of fund in the

¹ As per census 2011 in India, only 58.7% of households are availing banking services in the country. However, as compared to previous census 2001 (35.5%), availing of banking services increased significantly largely on account of increase in banking services.

² Following the Committee on Financial Inclusion can be defined as “the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as weaker sections and low income groups at an affordable cost” (NABARD, 2008).

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market to promote human development (supply-lending approach), the human development can also increase the demand of fund by which the financial sector develops (demand-following approach). On the other hand, Kuznets (1955) hypothesised that economic development is associated first with an increase and then a decrease in income inequality, resulting in an inverted U-shaped relationship between the two variables. Income inequality refers to the extent to which income is distributed in an uneven manner among a population. Apart from that, the inequality in the distribution of the income may have some effect on the relationship between the financial development and the human development. In the 1990s, economists started to establish the linkage between financial sector development and income inequality. Building on the ground of Kuznets' hypothesis, Greenwood and Jovanovic (1990) showed how the interaction of financial and economic development can give rise to an inverted U-shaped relationship between income inequality and financial intermediary development. In this context, the paper seeks to conceptualise the relation between finance, human well-being, income inequality in the context of inclusive development paradigm. Also, the paper attempts to test the hypothesis in the light of empirical evidence across countries of the world.

The rest of the paper is designed as follows. Section 2 explores the conceptual framework on the linkages among financial development, human development, and income inequality. In particular, in this section the theoretical insights on the operational linkages between the development indices are given and the implications of income inequality on nexus between the finance and human development nexus are discussed. Section 3 considers data sources of the paper. Methodological issues of the paper are analysed in Section 4. Section 5 deals with the empirical analysis on the linkages among development indices across countries of the world. Section 6 concludes the paper.

Operational Linkages between Financial Development, Human Development, and Income Inequality: A Conceptual Framework

Financial Development and Human Development

Economic sector can be broadly categorised into surplus spending economic unit (i.e., saver) and deficit spending economic units (i.e., spender) (Pathak, 2003). The savers

can increase their expenditure in health and education so as to develop human capital. Apart from that, they can provide a smooth supply of the flow of funds in the financial system which may lead to financial development. On the other hand, the spenders can utilise the fund in the market so as to invest in the formation of human capital of the economy. Thus, the process of financial development may be facilitated by the flow of fund from the savers of fund to the spender of fund. In this process, five pillars of financial system (financial institutions, financial market, financial instruments, financial service, and financial regulatory authority) can be strengthened.

There is bidirectional relationship between financial development and well-being of the population. According to the classical theory of market, the production will create demand for the product itself.³ In the present case, if the supply of the financial services increases, it will increase the demand of the financial services, which will ultimately lead to the economic well-being of the population. Thus, the causality between financial development and economic well-being can be explained by the supply-leading and demand-following hypothesis⁴ in practice. As financial development provides supply of fund (or credit) in the market to promote human development (supply-lending approach), the human development also increases the demand of fund by which the process of financial development accelerates (demand-following approach). There are mainly three broad dimension of human development: health, education, and income. Improvement in health increases the life longevity of the population by which the production is increased over time. Increases in production will lead to an increase in demand of fund. Improvement in education level has an impact on the quality of the labour force, which actually helps in achieving higher productivity. Ultimately, the demand of fund will increase with the enhancement of the

³ It is popularly known as Say's law (Say, 1803).

² Patrick (1966) developed these two approaches to establish the linkages between financial development and economic growth. The supply-leading hypothesis shows a causal relationship between financial development and economic growth. In fact, well-organised financial institutions and markets increase the supply of financial services and thus lead to real economic growth. On the other hand, the demand-following hypothesis shows a causal relationship between economic growth and financial development. Here, an increasing demand for financial services might induce an expansion in the financial sector as the real economy grows.

economic activities by the production. Increase in real per capita income results in widening of production-possibility set. Like the above-mentioned quantitative factors, some of the qualitative factors like social and psychological environments can also safeguard the emotional health of the population. Thus, it generates an adequate demand for financial services through an expansion of commerce and trade of a country. This relation is shown in Figure 1.

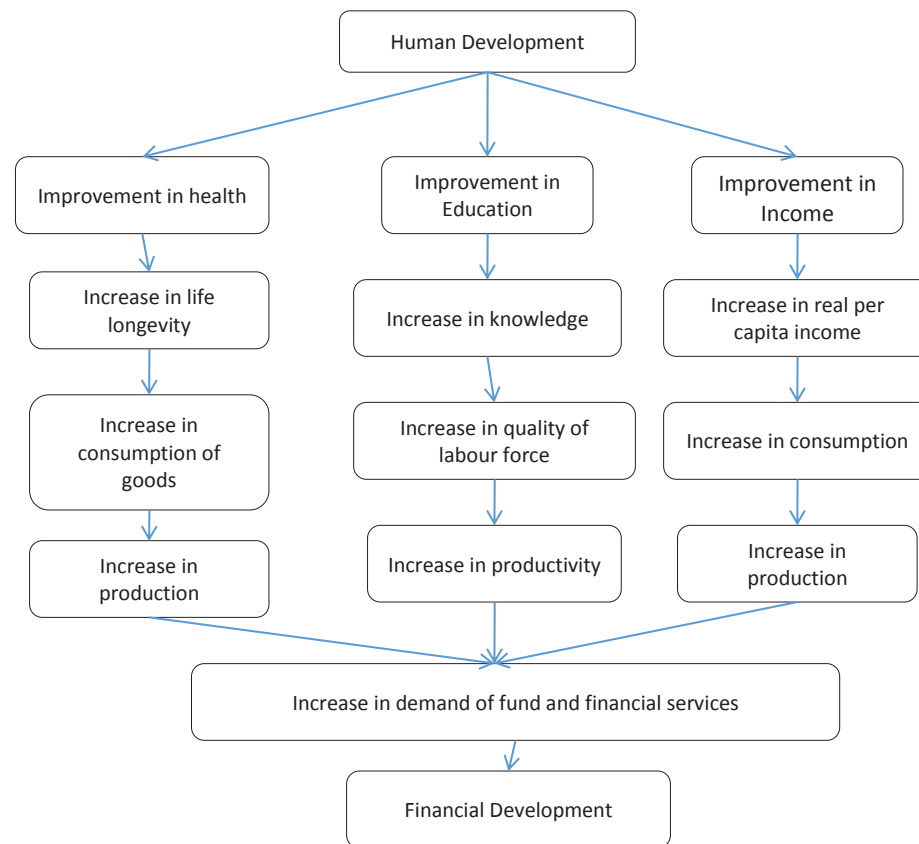


Fig. 1: Implications of Human Development on Financial Development

Financial development also contributes to achieve a higher level of human development. There are four main parameters of financial development; namely, access, depth, efficiency, and stability. Out of these four factors, the first two factors can be treated as the external or macro factor as they are concerned about providing financial services to the population. But the other two factor deals with internal affairs of the financial institution regarding the operational efficiency and sustainability of the institutions. The access dimension of the financial development considers increases in the branches and the bank accounts of the population by which the people will directly get the benefit of the government subsidy. Depth dimension of the financial development increases the supply of the credit in the market. It will enhance the business prospective and the employment opportunities, which is expected to increase the income of the population and thereby the well-being of the

population. The efficiency dimension of the financial development ensures the operational profitability of the financial institution. If the financial institutions are more efficient then it is possible to provide better service to the public. The stability dimension provides the sustainability of the financial institution by which public confidence is best protected and the better service can be provided. This relationship is shown in Figure 2.

Implications of Income Inequality on Development Indicators

The development indicators (i.e., financial and human development) are also influenced by the extent of income inequality. There are two approaches on the relationship between the income inequality and financial development; namely, inequality-widening hypothesis and inequality-narrowing hypothesis. According to the inequality-

widening approach, the rich people are able to offer the collateral securities against the loan and have the ability to repay the loan. The poor section of the population does not have that ability even if the financial markets are developed. On the other hand, inequality-narrowing hypothesis indicates that the poor people can access the loan when the financial market develops (Baligh & Pirae, 2012). There is another nonlinear relationship between

finance and inequality. At early stages of economic development, only the rich people can have access to the limited financial markets, and thereby as the financial system grows, inequality increases. However, when the higher level of economic development is achieved and larger segments of society can access the growing financial markets, inequality can be reduced (Greenwood & Jovanovic, 1990).

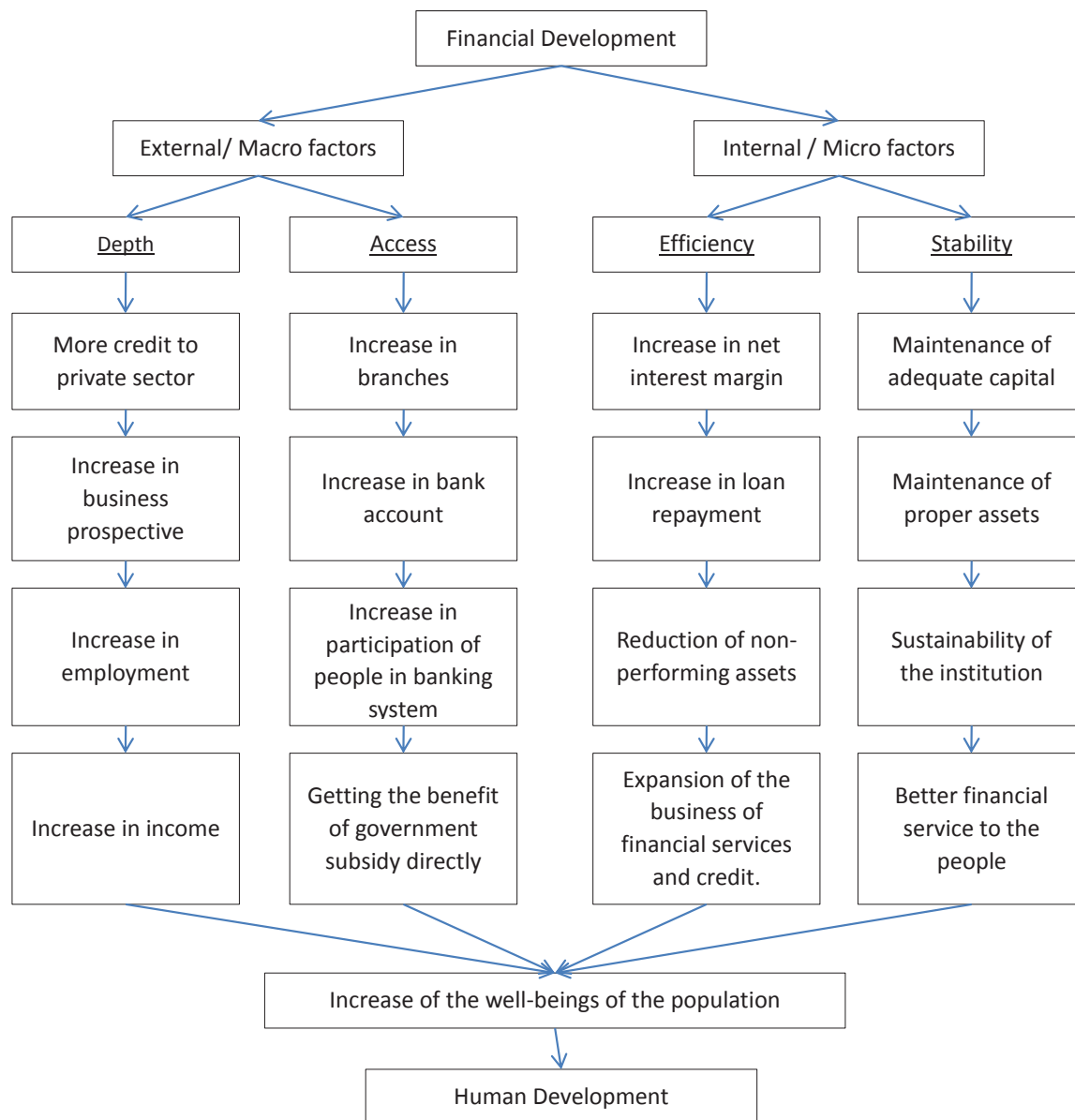


Fig. 2: Implications of Financial Development on Human Development

Income inequality also has a significant impact on the indicators of human development, viz. health and education indicators. There are four hypotheses through which the income inequality is related to health. Firstly,

absolute health hypothesis suggests that increase of income will reduce stress and people can afford better nutrition. In that case if one unit income is taken from rich and given to the poor, health status will also improve. Secondly, as per relative income hypothesis, income inequality depends

on the geographical proximity. If the people assess their income on the basis of the income of their neighbour then lower income increases the stress of the individual (Wilkinson, 1997). Thirdly, psychological approach suggests that inequality can have an impact on the health by reducing social capital, trust, and efficacy (Kawachi & Kennedy, 1997). In other words, income inequality worsens health condition because a lower ranking in the social hierarchy produces negative emotions (such as shame and distrust) that leads to worsen health via neuro-endocrine mechanisms (Wilkinson, 1996). Finally, as per neo-materialism approach, income inequality affects the health through uneven distribution of material resources (Coburn, 2000; Lynch et al, 2000).

Just like health, education dimension is also influenced by the inequality. In some cases, people having lower income always prefer to achieve other basic needs of life (other than education). In this context, a government intervention in the education sector through compulsory primary education system and mid-day meal in the schools may reduce the gap of the educational inequality. There is a link between the productivity and the education level of the people. Higher the level of education, more will be the contribution in the marginal product in the process of production. Thus, this additional premium for the educational attainment will help in accelerating economic growth of a country (Woessmann, 2014), which ultimately has an impact on the lowering income inequality. Thus, a proper investment in the educational sector will reduce the income inequality by lowering disparity in the educational level.

Data Sources

This paper is exclusively based on secondary sources of data. The paper utilises two comprehensive indices on financial development and human well-being: Financial Development Index (Findex) of World Economic Forum (WEF) and Human Development Index (HDI) of United Nations Development Project (UNDP). The WEF's Financial Services team released The Financial Development Report 2012 (the latest report available until date), the fifth edition since its inaugural publication in 2008. The report provides a score and rank for the breadth, depth, and efficiency of 62 of the world's leading financial systems and capital markets. It also provides information on different parameters of financial development, viz., Institutional environment, Business

Environment, Financial Stability, Banking Financial Services, Non-banking Financial Services, Financial Markets and Financial Access. The latest fifth edition of the Financial Development Report came at a time when the economic environment experienced recovery efforts in restoring confidence in the financial system around the world in 2012. It is the last year for the period of general economic decline observed in world markets (Rosenberg, 2012). In fact, the Great Recession (2007-2012) in the twentieth first century reflects a period of general economic and financial turn down observed in world markets during the late 2000s and early 2010s. Although the situation was arguably improving in 2012, the global economy had yet to fully stabilise.

However, in this paper all the data points are collected for the year 2012. The selection of the year is driven by the availability of data on financial development indicators as the latest values of Findex across countries of the world are available for the year 2012 (as reported in the Financial Development Report, 2012). We have prepared a dataset on financial and human development indices for 62 countries (being the common countries where the values of both the indices coexist for the year 2012). On the other hand, the measure of income inequality (i.e., Gini Coefficient) is available in the World Development Indicator (WDI) database. Similarly, a dataset of common 31 countries is prepared on the values of financial development, human development, and inequality measure (selecting the common countries for which the values of all the indices exist for the year 2012).

Methodology

The degree of association between development indicators is measured by the parametric test (Pearson correlation coefficient) and two other non-parametric tests (Spearman row and Kendall's tau). The correlation matrix between the Findex and HDI has been computed on the basis of the overall data of the 62 countries; whereas, the correlation coefficients are computed between the Findex, HDI, and the Gini Coefficient are computed on the basis of 32 countries as mentioned earlier.

Pearson correlation- It can be computed by using the following formula $[\text{cov}(x, y)/\sigma_x\sigma_y]$ where $\text{cov}(x, y)$ is the covariance between two development indicators and σ_x and σ_y are standard deviation of the development indicators x and y , respectively. The statistical significance

will be tested by t statistic with degree of freedom (n-2) where n is the sample size.

Spearman rho- It can be computed by using the following formula $[1 - \frac{6\sum d^2}{n^2(n-1)}]$ where d is the difference between the rank of the indices of the development indicators and n is the sample size. The statistical significance is tested by z statistic with (n-2) degree of freedom.

Kendell's tau- It is mainly used to measure the degree of association by using the formula $[\frac{s}{\sqrt{\frac{1}{12} k^2 (n^3 - n)}}]$ where, k = number of development indicators, s = square of mean deviation of the sum of the ranks and n = sample size. The statistical significance is tested by χ^2 distribution with (n-1) degree of freedom.

The results of the correlation suggest only co-relationship or association between the variables. To examine how an independent measure is numerically related with other dependent measure, six such linear relationships between the development indicators and the effect of the income inequality on the development indicators are estimated. The empirical specifications are written as follows:

The null hypothesis for no relation between the development indicators is given by $\beta_i = 0$, where $i = 1, 2, \dots, 6$. The hypothesis is tested in favour of an alternative hypothesis of $\beta_i \neq 0$. u_i is the error terms. The relative position of the countries in the development indicators are shown by the scatter diagram.

The concept of studentised residual is used in this paper to identify the presence of outlier in the dataset. An outlier is an observation point that is distinctly different from all other observations. A studentised residual is the quotient resulting from the division of a residual by an estimate of its standard deviation. If the value of studentised residual is more than absolute value of 2, it can be treated as the outlier in that dataset (Pope, 1976). We have also re-estimated these six regression equations by excluding the outlier in the dataset and observe the level of improvement in the result.

Empirical Results and Discussion

This section of the paper summarises the results of the correlation coefficients and regression equations on the relationship between the development indicators.

Degree of Association between the Development Indicators

The degree of association between Findex and HDI is measured by the Pearson correlation coefficient, Kendall's tau, Spearman rho. The correlation coefficients between Findex and HDI on the overall data of the 62 countries are estimated as 0.781 (Pearson Correlation), 0.644 (Kendall's tau-b), and 0.835 (Spearman's rho) during the year 2012. The estimated values of correlation coefficients are significant at 1% level of significance. Overall, it can be concluded that countries having a high level of human development are also the countries with a relatively high level of financial development.

Following the same measures, the correlation coefficients among Findex, HDI, and Gini Coefficient are also computed with the dataset of 31 countries. The correlation matrix shows the negative relation between the Gini Coefficient and the development indicators (i.e., Findex or HDI). However, the significance test of correlation coefficients suggests a robust association exists in between the Gini coefficient and the HDI, as compared to Gini coefficient and Findex (Table 1).

Table 1: Results of Correlation Matrix among Development Indicators

		<i>Findex</i>	<i>HDI</i>	<i>Gini</i>
Findex	Pearson Correlation	1	0.756***	-0.447**
	Kendall's tau_b	1	0.640***	-0.276**
	Spearman's rho	1	0.824***	-0.408**
HDI	Pearson Correlation		1	-0.702***
	Kendall's tau_b		1	-0.482***
	Spearman's rho		1	-0.666***
Gini	Pearson Correlation			1
	Kendall's tau_b			1
	Spearman's rho			1

Note: ***& **correlations are significant at the 0.01 level and 0.05 level (2-tailed), respectively.
Source: Authors' own calculation

Regression Analysis

The results of the regression analysis on six linear relationships (as specified in the empirical specifications in the methodology section) are presented in Table 2. It can be readily seen from the table that the regression

coefficient (β) in each equation is statistically significant. The intuitive explanation of individual relations can be analysed as follows.

Financial Development and Human Development:

The result of first equation (Equation 1a) shows that 1% change in the estimated value of HDI is accompanied with the 5.28% change in Findex. The result is significant at 1% level of significance. This empirical result also ensures the existence of the chain of command by which the improvement of health and education is associated with the expansion and development of the financial structure. The value of R^2 (60%) also signifies the goodness of fit of the model. The analysis of the outlier data points shows that countries like Argentina and Venezuela are the outliers as the values of studentised residual are more than 2 in each cases (see Table A1 in Appendix). The re-estimation the result (Equation 1b) after dropping these two countries shows an increase in the value of the R^2 (by

6%) along with a slight increase of β (by 0.01 only).

On the other hand, the results of Equation 2a show that 1% change in the estimated value of Findex results in less than one percentage (i.e., 0.1153 percentages) change in HDI. This result may indicate the existence of the positive force by which outreach access to the well-being of the population. Not only that, the micro factors like efficiency and stability aspects of financial development may also have some positive impact on the human well-being. Again the value of R^2 (61%) signifies the extent of goodness of the fit of the model. The analysis of the outlier data points shows that only Argentina is the outlier country as the value of studentised residual for this country is more than 2 (Table A1). The re-estimated result (Equation 2b) is not that much improved (increase of the R^2 by 3% along with a slight increase of β by 0.004 only). However, both the results of β are significant statistically.

Table 2: Summarisation of the Results of Regression Equations

Equation no.	Dependent Variable	Independent Variable	Intercepts (a)	t-stat of a	Slope (β)	t-stat of β	R^2	Obs
1a	Findex	HDI	-0.4595	-1.0535	5.2821	9.6784***	60.955	62
1b	Findex	HDI	-0.4319	-1.0875	5.2987	10.6648***	66.227	60
2a	HDI	Findex	0.3616	9.6783***	0.1154	9.6784***	60.955	62
2b	HDI	Findex	0.3436	7.6640***	0.1196	10.1771***	63.708	61
3a	Gini Coefficient	Findex	56.3967	7.1045***	-5.6222	-2.6935**	20.010	31
3b	Gini Coefficient	Findex	51.8381	7.4812***	-4.7007	-2.5983**	20.002	29
4a	Findex	Gini Coefficient	5.0038	10.4365***	-0.0355	-2.6934**	20.01	31
4b	Findex	Gini Coefficient	4.8922	11.0270***	-0.0337	-2.7672***	21.47	30
5a	Gini Coefficient	HDI	97.8244	8.2834***	-75.2236	-5.3140***	49.334	31
5b	Gini Coefficient	HDI	94.0426	8.3759***	-71.1710	-5.3008***	50.087	30
6a	HDI	Gini Coefficient	1.0624	23.7265***	-0.0065	-5.3139***	49.33	31
6b	HDI	Gini Coefficient	1.0589	26.3189***	-0.0063	-5.6903***	53.62	30

Note: *** & ** indicate that the coefficient is significant at the 0.01 level and 0.05 level, respectively.

Source: Authors' own calculation

Financial Development and Income Inequality: The analysis shows that financial development has a negative and statistically significant effect on the income inequality (Equation 3a). The empirical result suggests the validity of inequality-narrowing hypothesis. It means that the financial development provides an opportunity to the poor people to engage themselves in income-generation activities by an access to credit from the financial institution, and thereby lowering the income inequality. The removal of outlier, i.e., Brazil and Colombia (Table A2) from the dataset does not improve the value of R^2

(Equation 3b), and the value of β is decreased nominally. On the other hand, when Gini Coefficient is regressed on Findex, empirical result exhibits a negative and significant effect of the income inequality on the financial development (Equation 4a). The removal of the UK, i.e., the outlier (Table A2) does not significantly affect the relation (Equation 4b). It also indicates that an increase in the disparity in the income level of the population often restricts the poor to access the services of the financial system of a country.

Human Development and Income Inequality: Like financial development, the negative relation between the income inequality and the human development is found to be statistically significant (Equation 5a). The results show that the 1% change in the HDI is associated with a 75.22% change in Gini coefficient. An improvement in the well-being of the population, in fact, helps in reducing inequality in the distribution of income. However, removal of Panama (being the outlier, Table A2) does not reflect an improvement of the result (Equation 5b). On the other hand, the estimation result in the opposite direction (i.e., Gini Coefficient is regressed on HDI) shows that one unit change in the Gini coefficient is associated with a very negligible change in HDI (Equation 6a). Like the previous cases, the removal of outlier (i.e., Vietnam as in Table A2) does not have any sort of significant effect on the estimated coefficient in this relationship (Equation 6b).

Graphical Analysis

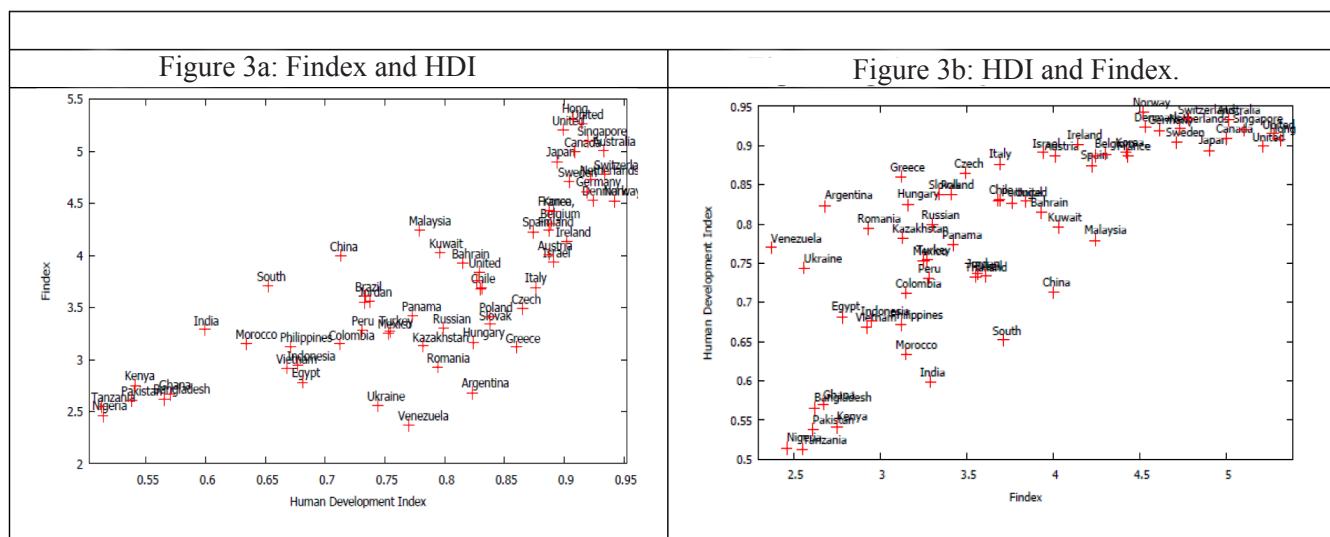
The relative positions of the countries in the development indicators are shown in the scatter diagrams (Figure 3). Figures 3a and 3b represent the scatter plots of countries in the Findex and HDI, respectively. In both the figures, a number of countries are gathered in the north-east area which indicates that countries performing well in financial development also performs well in human development and vice versa. A deeper insight of scatter plot (3a) also identifies the countries Argentina and Venezuela as outliers. In fact, these two countries maintain a higher level of human development in spite of a relatively low level of financial development. The relationship between the Gini coefficient and the Findex is shown in the scatter plots 3c and 3d. On the other hand, the scatter plots 3e and 3f deal with the relation between the Gini coefficient and the HDI. The group of countries are positioned in the

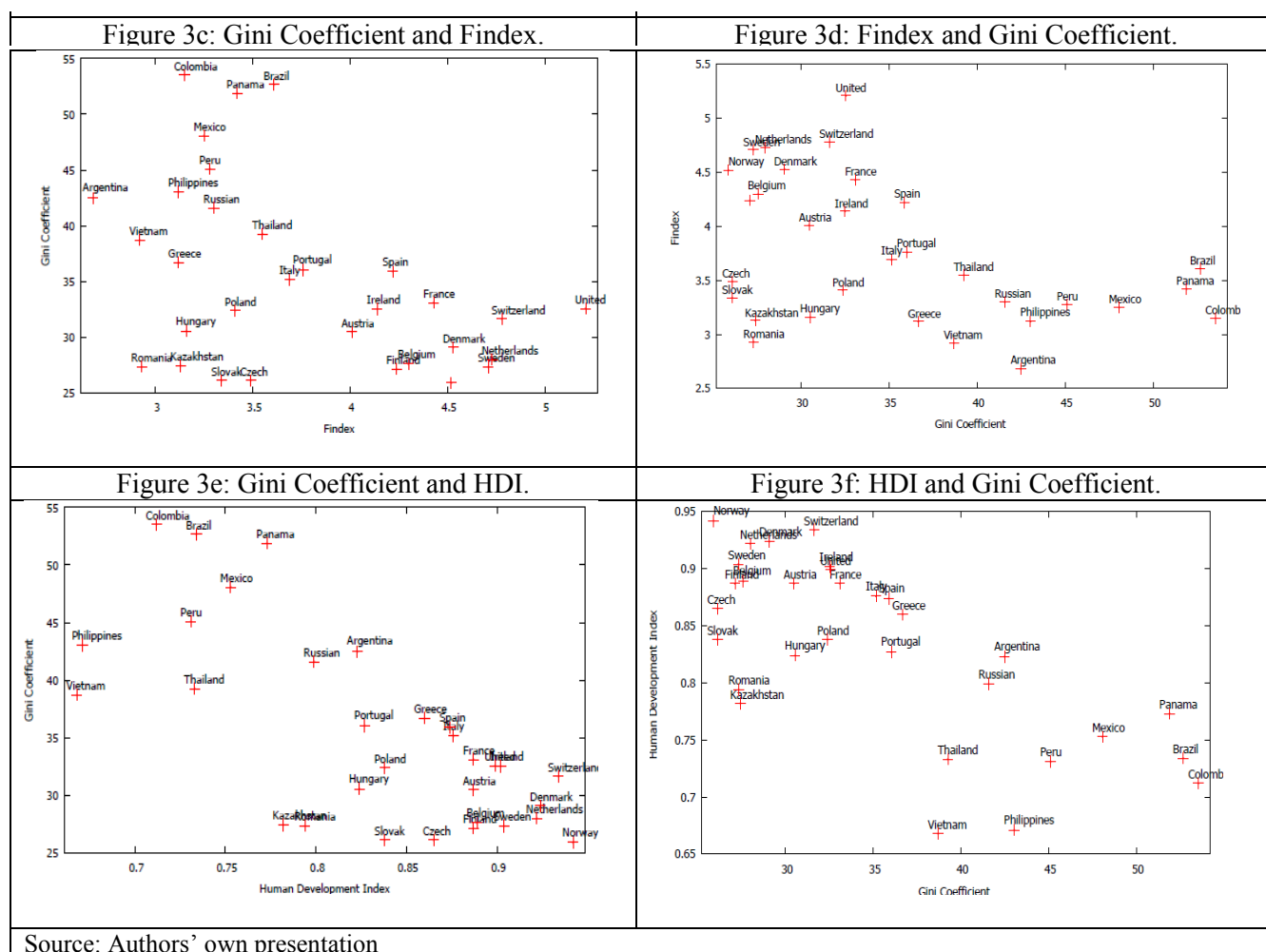
north-west and south-east areas in Figures 3c and 3e,⁵ which further supports our earlier observation results that the development indicators (financial or human development) have negative implications on income inequality. But more crowded scatter points in the south-east area of Figure 3e, (in comparison to Figure 3c), may explain the robust implications of human development (in comparison to financial development) in reducing income inequality across countries of the world. A similar observation on the location of huge crowd in the north-west corner of Figure 3f is also supporting the general fact that relatively less inequality countries experiences a higher level of human development.

Conclusion

This paper attempts to develop a conceptual framework on the relationship among financial development, well-being of the population, and income inequality. In the conceptual framework, a mutually reinforcing relation between financial development and the well-being of the population is explained by the relevance of demand-following and supply-leading hypotheses. Testing the hypotheses by using cross-country empirical evidences suggest that the magnitude of the implications of the well-being indicators on the development of financial sector is relatively robust in comparison to the other way round (i.e., impact of financial development on well-being of the population). On the other hand, the empirical relationship between the development indicators and the income inequality shows that the income inequality can be reduced either by improving the well-being of the population or by financial sector development.

⁵ Figure 3c also shows the positions of Brazil and Colombia are far away from the group behaviour of other countries. The position of Panama is also distinctly different from the other countries in Figure 3e.




Fig. 3: Relative Position of the Countries in the Scatter Plot

Appendix

Table A1: Values of Findex, HDI, and Studentised Residuals of Equations 1a & 2a

Countries	Findex [#]	HDI [§]	Studentised residuals equation 1a [@]	Studentised residuals equation 2a [@]
Argentina	2.680	0.823	-2.402	2.074
Australia	5.010	0.933	1.089	-0.094
Austria	4.010	0.887	-0.431	0.842
Bahrain	3.930	0.815	0.168	-0.003
Bangladesh	2.620	0.565	0.195	-1.353
Belgium	4.300	0.889	0.127	0.420
Brazil	3.610	0.734	0.383	-0.596
Canada	5.000	0.909	1.319	-0.408
Chile	3.690	0.831	-0.477	0.585
China	4.000	0.713	1.383	-1.485
Colombia	3.150	0.712	-0.302	-0.178
Czech Republic	3.490	0.865	-1.236	1.353
Denmark	4.530	0.924	0.219	0.536
Egypt	2.780	0.681	-0.716	-0.020
Finland	4.240	0.887	0.029	0.486

<i>Countries</i>	<i>Findex[#]</i>	<i>HDI^{\$}</i>	<i>Studentised residuals equation 1a[@]</i>	<i>Studentised residuals equation 2a[@]</i>
France	4.430	0.887	0.408	0.191
Germany	4.610	0.919	0.432	0.344
Ghana	2.670	0.570	0.243	-1.362
Greece	3.120	0.860	-1.920	1.868
Hong Kong SAR	5.310	0.907	1.961	-0.939
Hungary	3.160	0.824	-1.458	1.319
India	3.290	0.599	1.190	-1.919
Indonesia	2.950	0.677	-0.333	-0.340
Ireland	4.140	0.902	-0.330	0.843
Israel	3.940	0.891	-0.614	1.004
Italy	3.690	0.876	-0.954	1.190
Japan	4.900	0.894	1.275	-0.454
Jordan	3.560	0.737	0.252	-0.478
Kazakhstan	3.130	0.782	-1.076	0.799
Kenya	2.750	0.541	0.727	-1.879
Korea, Rep.	4.420	0.891	0.346	0.260
Kuwait	4.030	0.796	0.567	-0.414
Malaysia	4.240	0.779	1.163	-0.972
Mexico	3.250	0.753	-0.533	0.219
Morocco	3.150	0.634	0.526	-1.232
Netherlands	4.730	0.922	0.642	0.197
Nigeria	2.460	0.514	0.426	-1.807
Norway	4.520	0.942	0.008	0.796
Pakistan	2.610	0.538	0.471	-1.707
Panama	3.420	0.773	-0.405	0.224
Peru	3.280	0.731	-0.242	-0.124
Philippines	3.120	0.671	0.071	-0.686
Poland	3.410	0.838	-1.108	1.115
Portugal	3.760	0.827	-0.296	0.422
Romania	2.930	0.794	-1.599	1.277
Russian Federation	3.300	0.799	-0.916	0.761
Saudi Arabia	3.680	0.830	-0.487	0.587
Singapore	5.100	0.920	1.406	-0.417
Slovak Republic	3.340	0.838	-1.248	1.224
South Africa	3.710	0.652	1.459	-1.854
Spain	4.220	0.874	0.126	0.342
Sweden	4.710	0.904	0.790	-0.017
Switzerland	4.780	0.934	0.616	0.283
Tanzania	2.550	0.513	0.625	-1.957
Thailand	3.550	0.733	0.274	-0.516
Turkey	3.270	0.754	-0.504	0.202
Ukraine	2.560	0.744	-1.812	1.189
United Arab Emirates	3.840	0.829	-0.158	0.325
United Kingdom	5.210	0.899	1.844	-0.886
United States	5.270	0.915	1.799	-0.762
Venezuela	2.370	0.770	-2.461	1.857
Vietnam	2.920	0.668	-0.299	-0.416

Source: [#]WEF Database, ^{\$}UNDP Database, [@]Authors' own calculation.

Table A2: Values of Findex, HDI, Gini Coefficient and Studentised Residuals of Equations 3a, 4a, 5a & 6a

Countries	Findex [#]	HDI [§]	* Gini Coefficient	Studentised residuals for Equation 3a [@]	Studentised residuals for Equation 4a [@]	Studentised residuals for Equation 5a [@]	Studentised residuals for Equation 6a [@]
Argentina	2.680	0.823	42.490	0.162	-1.378	1.103	0.713
Austria	4.010	0.887	30.480	-0.451	0.153	-0.105	0.441
Belgium	4.300	0.889	27.590	-0.626	0.473	-0.569	0.136
Brazil	3.610	0.734	52.670	2.213	0.873	1.734	0.330
Colombia	3.150	0.712	53.540	2.011	0.095	1.621	0.013
Czech Republic	3.490	0.865	26.130	-1.425	-1.000	-1.115	-0.478
Denmark	4.530	0.924	29.080	-0.253	0.950	0.131	0.947
Finland	4.240	0.887	27.120	-0.733	0.343	-0.674	0.044
France	4.430	0.887	33.100	0.219	1.015	0.338	0.748
Greece	3.120	0.860	36.680	-0.295	-0.970	0.597	0.684
Hungary	3.160	0.824	30.550	-1.093	-1.276	-0.887	-0.688
Ireland	4.140	0.902	32.520	-0.081	0.493	0.433	0.950
Italy	3.690	0.876	35.160	-0.066	-0.104	0.545	0.792
Kazakhstan	3.130	0.782	27.430	-1.541	-1.529	-1.954	-1.834
Mexico	3.250	0.753	48.070	1.340	-0.074	1.176	0.108
Netherlands	4.730	0.922	27.990	-0.252	1.228	-0.082	0.784
Norway	4.520	0.942	25.900	-0.695	0.751	-0.185	0.907
Panama	3.420	0.773	51.900	1.975	0.475	2.070	0.983
Peru	3.280	0.731	45.110	0.963	-0.203	0.393	-0.655
Philippines	3.120	0.671	43.040	0.567	-0.599	-0.781	-1.990
Poland	3.410	0.838	32.390	-0.648	-0.741	-0.402	-0.216
Portugal	3.760	0.827	36.040	0.104	0.065	0.071	0.016
Romania	2.930	0.794	27.330	-1.726	-1.877	-1.813	-1.628
Russian Federation	3.300	0.799	41.590	0.504	-0.378	0.651	0.168
Slovak Republic	3.340	0.838	26.120	-1.545	-1.258	-1.454	-0.975
Spain	4.220	0.874	35.890	0.433	0.828	0.643	0.843
Sweden	4.710	0.904	27.320	-0.360	1.156	-0.426	0.378
Switzerland	4.780	0.934	31.640	0.295	1.518	0.705	1.424
Thailand	3.550	0.733	39.260	0.377	-0.095	-0.591	-1.297
United Kingdom	5.210	0.899	32.570	0.799	2.295	0.403	0.902
Vietnam	2.920	0.668	38.700	-0.176	-1.188	-1.614	-2.533

Source: [#] WEF Database, [§] UNDP Database, ^{*} WDI Database, [@] Authors own calculation.

References

- Pope, A. J. (1976). *The Statistics of Residuals and the Detection of Outliers*, U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Ocean Survey, Geodetic Research and Development Laboratory, 136.
- Baligh, N., & Pirae, K. (2012). Financial development and income inequality relationship in Iran. *Middle-East Journal of Scientific Research*, 12(7), 906-914.
- Coburn, D. (2000). Income inequality, social cohesion and the health status of populations: The role of neo-liberalism. *Social Science & Medicine*, 51(1), 135-146.
- Greenwood, J., & Jovanovic, B. (1990). Financial development, growth, and the distribution of Income. *Journal of Political Economy*, 98(5), 1076-1107.
- Kawachi, I., & Kennedy B. P. (1997). Social Capital, income inequality, and mortality. *American Journal of Public Health*, 87(9), 1491-1498.

- Kuznets, S. (1955). Economic growth and income inequality. *The American Economic Review*, 45(1), 1-28.
- Lynch, J. W., Smith, G. D., Kaplan, G. A., & House, J. S. (2000). Income inequality and mortality: importance to health of individual income, psychosocial environment, or material conditions. *British Medical Journal*, 320(7243), 1200.
- NABARD. (2008). Report of Committee on Financial Inclusion. Retrieve from https://www.nabard.org/pdf/Full_Report.pdf
- Pathak, B. V. (2003). *The Indian financial system: Markets, institutions and services*. Pearson Education India.
- Patrick, H. (1966). Financial development and economic growth in underdeveloped countries. *Economic Development and Cultural Change*, 14(2), 174-189.
- Rosenberg, J. (2012). The Concise Encyclopaedia of the Great Recession 2007-2012, *Scarecrow Press*.
- Say, J. B. (1803). *A treatise on political economy* (3rd. US ed.). Philadelphia: John Grigg.
- Sen, A. (1985). *Commodities and capabilities*, Amsterdam: North Holland.
- UNDP (1990). *Human Development Report, 1990*. New York: Oxford University Press. Retrieved from http://hdr.undp.org/sites/default/files/reports/219/hdr_1990_en_complete_nostats.pdf
- Wilkinson, R. G. (1997). Comment: Income, inequality, and social cohesion. *American Journal of Public Health*, 87(9), 1504-1506.
- Woessmann, L. (2014). *The Economic Case for Education*. EENEE Analytical Report No. 20, Prepared for the European Commission, Retrieved from https://www.cesifo-group.de/dms/EENEE/Analytical_Reports/.../EENEE_AR20.pdf
- World Economic Forum (2012). *Financial Development Report 2012*. Retrieved from <https://www.weforum.org/reports/financial-development-report-2012>