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Financial Intermediation versus Direct Financing: A Meta-Analytic Comparison of the Growth-Enhancing Effect*

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Abstract: This study is the first meta-analysis to compare financial intermediation and direct financing in terms of their growth-promoting effects. Meta-synthesis of 1693 estimates extracted from 168 previous studies strongly suggest that, in general, financial development has a positive effect on economic growth and the synthesized effect size of the direct financing study exceeding that of the financial intermediation study. The two exceptions are when the average estimation year is limited to 1989 or before and when the target region is restricted to Latin America and the Caribbean. Results from meta-regression analysis and tests for publication selection bias show, however, that some synthesis results cannot be reproduced when literature heterogeneity and publication selection bias are taken into consideration.

JEL classification numbers: E44; G10; O40; P43

Keywords: financial intermediation, direct financing, growth-promoting effect, meta-synthesis, meta-regression analysis, publication selection bias

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1 Introduction

The relationship between financial development and economic growth has long been examined in economics. As established by Gurley and Shaw (1960), there are two ways to transfer funds from ultimate lenders to ultimate borrowers: direct and indirect finance. In direct finance, borrowers raise funds directly from lenders in financial markets by selling them securities. In indirect finance, financial intermediaries transfer funds from ultimate lenders to ultimate borrowers. Schumpeter (1911) claimed that credit extended to the entrepreneur for the purpose of innovation is an element of economic development. This shows that when banks advance financial intermediary functions, they contribute to economic growth. On the other hand, Levine (1991) demonstrated that stock markets accelerate growth by facilitating the ability to trade ownership of firms without disrupting the productive processes occurring within firms and by allowing agents to diversify portfolios.

The literature indicates that both direct financing and financial intermediation could have a positive effect on economic growth. Which of them has a larger effect, however, has not yet been solved theoretically nor empirically. This aspect, however, has considerable importance because there are long-standing controversies regarding which system, direct financing or financial intermediation, is best for allocating funds and enhancing growth. Specifically, some former studies have claimed that bank-based systems are better at mobilizing savings, identifying good investments, and exerting sound corporate control, particularly during the early stages of economic development and in weak institutional environments (e.g., Levin, 2002). Although this perspective seems plausible, there is no clear consensus on it. Moreover, some economists claim that direct financing has advantages in allocating capital and attenuating control by powerful banks (e.g., Hellwig, 1991; Rajan, 1992). Although this viewpoint can be seen in several papers, it has not yet been proven whether it is the case when there is substantial information asymmetry.

Taking the above discussions into account, we investigate whether financial development fosters economic growth, and if so, which has a larger growth-enhancing effect, financial intermediation or direct financing, based on the rich empirical evidence of their growth-enhancing effects available in the literature. Existing studies, however, employ so many different types of variables and empirical methods that it is practically impossible to draw clear conclusions from a narrative review. Therefore, we will conduct a meta-analysis that synthesizes and compares 1693 estimates reported in a total of 168 previous research works, taking into account their precision, heterogeneity among the studies, and possible bias arising from publication selection. More concretely, in this paper, we will perform (a) meta-synthesis of collected estimates, (b) meta-regression analysis of heterogeneity across studies, and (c) testing for publication selection bias according to Stanley and Doucouliagos (2012) and Iwasaki (2020).

Although several meta-analyses of the finance–growth literature have been attempted in recent years (Bumann et al., 2013; Arestis et al., 2015; Asongu, 2015; Valickova et al., 2015; Bijlsma et al., 2018; Guo and He, 2020; Anwar and Iwasaki, 2022, 2023; Iwasaki, 2022; Ono and Iwasaki, 2022; Brada and Iwasaki, 2023; Iwasaki and Kočenda, 2023; Iwasaki and Ono, 2023), no study has been conducted to compare financial intermediation and direct financing from the viewpoint of their growth-promoting effects using advanced meta-analytic techniques. This is precisely the focus of this paper. Therefore, the contribution of this study to the existing literature lies in examining the growth-enhancing effect of financial intermediation and direct financing by estimation years, regions, and national income levels, utilizing advanced meta-analysis techniques.

Meta-synthesis of 1693 estimates extracted from 168 previous studies strongly suggests that financial development has a positive effect on the economic growth and synthesized effect size of the direct financing study exceeding that of the financial intermediation study. The two exceptions are when the average estimation year is limited to 1989 or before and when the target region is restricted to Latin America and the Caribbean. However, results from meta-regression analysis (MRA) and tests for publication selection bias show that some synthesis results cannot be reproduced when literature heterogeneity and publication selection bias are taken into consideration. Further research would be required in order to determine the growth-enhancing effects of financial intermediation and direct financing.

The remainder of this paper is organized as follows: Section 2 overviews previous studies and proposes our testable hypothesis. Section 3 explains the procedure of literature search, extraction of estimates, and methodology of meta-analysis. Section 4 conducts a meta-synthesis, meta-regression analysis (MRA), and tests for publication selection bias using estimates extracted from the selected literature. Section 5 concludes the paper.

2 Financial Intermediation versus Direct Financing: Literature Review and Hypothesis Development

As mentioned above, whether the development of financial intermediation and direct financing foster economic growth has been one of the major topics in financial studies. Levine (2005) claimed that the following five categories are helpful in organizing a review of the theoretical literature and in understanding the history of economic thought on finance and growth: (i) the acquisition of information on firms, (ii) the monitoring of firms, (iii) the provision of risk-reducing arrangements, (iv) the pooling of savings, and (v) the ease of making transactions. Each of these financial functions may influence savings and investment decisions and, hence, economic growth.

2.1 The Acquisition of Information on Firms

Large costs are associated with evaluating the business conditions of firms for making investment decisions. Individual savers might not have sufficient information on possible investments, whereas financial intermediaries as well as securities markets could reduce the costs of acquiring and processing information.

Studies that theoretically argue for the importance of the acquisition of information on firms by financial intermediaries are as follows. Boyd and Prescott (1986) investigated an environment in which the investment opportunities of agents are private information and show that financial intermediaries arise endogenously within that environment. In their analysis, informational asymmetries exist prior to contracting; thus, adverse selection is a crucial problem. Their models suggest that a Pareto-optimal allocation is supported by competitive intermediary–coalitions. Their analysis demonstrates that financial intermediaries attenuate information frictions and improve resource allocation.

Greenwood and Jovanovic (1990) also described intermediaries' role of collecting information. Their theoretical model shows that economic growth fosters investment in organizational capital, which in turn promotes further growth. In the model, institutions arise endogenously to facilitate trade in the economy. Trading organizations allow for a higher expected rate of return on investment. In the environment modeled, information is valuable, since it allows investors to learn about the aggregate state of technology. Intermediaries collect and analyze information that allows investors' resources to flow to their most profitable use. By investing through an intermediary, individuals gain access to a wealth of others' experience.

On the other hand, studies that examine the role of securities markets in acquiring information firms are as follows. Grossman and Stiglitz (1980) propose a theoretical model in which there is a degree of equilibrium in disequilibrium: prices reflect the information of informed individuals (arbitrageurs), but only partially, so that those who expend resources to obtain information receive compensation. In their model, prices play a well-articulated role in conveying information from the informed to the uninformed. When informed individuals observe information showing that the return to a security is going to be high, they bid its price up, and they do the opposite when they observe information that the return is going to be low. Thus, the price system makes information obtained by informed individuals publicly available to the uniformed. Prices reflect information only partially, and if prices fully reflect information, then there is no equilibrium. Their model suggests that securities markets also stimulate the production of information about firms.

Holmström and Tirole (1993) showed that stock prices incorporate performance information that cannot be extracted from a firm's current or future profit data. The amount of information contained in the stock price depends on the liquidity of the market.

2.2 The Monitoring of Firms

If creditors and shareholders effectively monitor firms, managers are stimulated to allocate resources to maximize the firms' value.

Articles that discuss the monitoring of firms by financial intermediaries are as follows. Diamond (1984) claimed that an intermediary (such as a bank) is delegated the task of the costly monitoring of loan contracts written with firms who borrow from it. It has a gross cost advantage in collecting this information because the alternative is either a duplication of effort if each lender monitors directly, or a free-rider problem, in which case no lender monitors.

Sussman (1993) constructed a theoretical model of a monopolistically competitive banking system and focused on the allocation of capital with asymmetric information. When the capital stock increases, the market for financial intermediation grows, and the number of banks increases. Each bank becomes more specialized, and thus efficient, over a smaller market share. Also, the industry becomes more competitive. As a result, intermediation costs—including monitoring costs—fall, and the markup decreases.

On the other hand, Scharfstein (1988) explicitly modeled the source of contractual inefficiencies and explored the conditions under which a takeover threat plays a genuine role in disciplining management. Their focus is on asymmetric information between shareholders and management as a source of contractual inefficiency. A raider who is informed about a firm's environment can mitigate this inefficiency. If firm value is low because the manager shirked, the probability of a takeover is high; shareholders tender their shares at a low price because they perceive the value of the firm to be low, while the raider knows that the firm's value is high if it is run properly. In contrast, if firm value is low simply because the environment is unfavorable, the probability of a takeover is low; shareholders still tender their shares at a low price, but the raider does not value the firm as highly. Thus, the takeover mechanism provides a means of penalizing the manager precisely when he should be penalized—when firm value is low because the manager shirked and not because the environment was unfavorable.

2.3 The Provision of Risk-Reducing Arrangements

Financial systems may mitigate the risks associated with individual projects, firms, industries, regions, countries etc., and the ability of financial systems to provide risk diversification services can affect economic growth in the long run by altering resource allocation and savings rates (Levine, 2005). Obstfeld (1994) developed a dynamic continuous-time model in which international risk sharing can yield substantial welfare gains through its positive effect on expected consumption growth.

As for risk-reducing arrangements of financial intermediaries, Allen and Gale (1997) showed that in an economy with intermediaries and no financial markets, accumulating reserves of safe assets allows returns to be smoothed and nondiversifiable risk to be eliminated. de la Fuente and Marín (1996) developed a simple model to illustrate how capital accumulation, technological progress, and financial development interact and mutually reinforce each other in a growing economy. Innovation is risky, and the probability of success depends on entrepreneurs' actions, which can only be imperfectly observed by outsiders through the use of costly monitoring technology. The existence of a moral hazard problem requires that contracts between intermediaries and innovating entrepreneurs be structured so as to induce optimal effort through a combination of incentive provision and monitoring. Banks actively seek information concerning the actions of borrowers. This allows them to offer better insurance terms and lowers the expected cost of the contract by reducing the risk premiums required by risk-averse innovators. By allowing for better risk sharing, closer monitoring yields a higher level of innovative activity in equilibrium.

On the other hand, Saint-Paul (1992) suggested that capital markets make possible the spreading of risk through financial diversification. Without such markets, agents can limit risk only by choosing less-specialized and less-productive technologies (technological diversification). This interaction may lead to multiple equilibria. With low equilibrium, financial services are underdeveloped, and technology is unspecialized. The opposite is true with high equilibrium. The model is extended to account for multiple growth paths and divergence across identical countries.

2.4 The Pooling of Savings

In light of the transaction and information costs associated with mobilizing savings from many agents, numerous financial arrangements may arise to facilitate the pooling of savings (Levine, 2005).

Sirri and Tufano (1995) claimed that the creation of a legal entity that could serve as a vehicle for pooling was a critical development in facilitating the evolution of more complex pools. Without a legally defined "firm" or "corporation," investors would need a nexus of contracts binding one to each of the others instead of linking each investor to a central legal entity or hub. Costs of commerce would be high.

A second level at which pooling takes place is through the creation of multilateral contracts between a set of investors and a set of firms. The fund management company constructs bilateral contracts between mutual fund investor and fund, and between the fund and the firms in which it purchases equity or debt. This multilateral or multi-level contract conception of pooling produces entities that intercede between households and firms—financial intermediaries that take the form of banks, pension funds, mutual funds, and diversified conglomerates.

2.5 The Ease of Making Transactions

Levine (2005) indicated that Smith (1776) focused on the role of money in lowering transaction costs, the permitting of greater specialization, and the fostering of technological innovation.

Greenwood and Smith (1996) claim that markets—especially financial markets—play a central role in economic development, and that economic development leads to the formation of new markets. The economic importance of financial markets for growth derives from the fact that they fulfill several of the following functions. First, markets enhance growth to the extent that they serve to allocate resources to the place in the economic system where their social return is greatest. Second, market formation permits increased specialization. Third, market structures affect agents' incentives to accumulate various types of physical and human capital, as well as other kinds of assets.

Financial markets are the most prominent means, for instance, of channeling investment capital to uses with the highest return. These markets also provide liquidity and permit the efficient pooling of risk. Both of these activities alter the social composition of savings in a way that is potentially favorable to enhanced capital accumulation. Their analysis shows that financial markets facilitate transactions.

2.6 Hypothesis for Meta-Analysis

As mentioned above, financial intermediation, as well as direct financing, has functions that influence savings and investment decisions and, hence, economic growth. Here, the question arises: Which has a larger growth-enhancing effect, financial intermediation or direct financing?

Rajan (1992) argued that, while informed banks make flexible financial decisions that prevent a firm's projects from going awry, the cost of this credit is that banks have bargaining power over the firm's profits once projects have begun. Levine (1991) demonstrates that stock markets accelerate growth by facilitating the ability to trade ownership of firms without disrupting the productive processes occurring within firms and allowing agents to diversify portfolios. Furthermore, Allen and Gale (1999) compared the effectiveness of financial markets and financial intermediaries in financing new industries and technologies in the presence of diversity of opinion. In markets, investors become informed about the details of the new industry or technology and make their own investment decisions. With intermediaries, the investment decision is delegated to a manager, who is the only one who needs to become informed; this saves on information costs, but investors may anticipate disagreement with the manager and be unwilling to provide funds. Allen and Gale (1999) concluded that financial markets tend to be superior when there is significant diversity of opinion and information is inexpensive.

These arguments suggest that direct financing has advantages over financial intermediation in the aforementioned five categories of financial functions. Reflecting the findings of these studies, we propose the following hypothesis.

Hypothesis: *The growth-enhancing effect of direct financing tends to exceed that of financial intermediation, ceteris paribus.*

To test the above hypothesis, the following sections will conduct a meta-analysis of the existing literature.

3 Literature Selection, Extraction of Estimates, and Methodology of Meta-Analysis

In this section, as the first step in testing the proposed hypothesis, we first describe the procedure of literature selection and overview estimates included in the meta-analysis, and we then explain the methodology of the meta-analysis performed in this paper.

3.1 Literature Selection and Extraction of Estimates

To identify extent research works that empirically examine the impact of financial intermediation and direct financing on economic growth, we searched for related literature by accessing EconLit and major academic press websites.[1] In utilizing these electronic databases of academic literature, we carried out an AND search of paper titles, using "*finance*" or "*financial*" and "*growth*" as keywords. This title search yielded nearly 3,000 hits on EconLit and more than 640 additional hits from major academic press websites. After eliminating duplication among the literature found through these mechanical searches, we confirmed that, at a minimum, the literature in this field consisted of more than 2,900 works published in English. Needless to emphasize, they include numerous studies intended for purposes other than the empirical analysis of the effect of finance on GDP growth.

As a second step, we closely inspected the content of each study to determine whether it examined the growth-enhancing effect of the variable of the total amount of bank credit to GDP and/or market capitalization measured by the total value of a publicly traded company's outstanding common shares divided by GDP, which are representative variables of financial intermediation and direct financing, respectively, and, if so, whether it included estimates that could be used in our meta-analysis. This narrowed the literature list to a total of 168 papers.[2] For the present study, we adopted an eclectic coding rule in which we do not necessarily limit selection to one estimate per study; instead, multiple estimates are collected from these 168 studies, if and only if we can recognize notable differences from the viewpoint of empirical methodology in at least one item of the target economy/region, estimation period, data type, regression equation, estimator, and so forth. Hereinafter, we call selected research works that report estimates of the variable of bank credit to GDP "studies of financial intermediation (FI studies)" and those that provide estimates of the variable of market capitalization "studies of direct financing (DF studies)."

Table 1 overviews the selected works and collected estimates. As shown in the table,

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[1] The following academic press websites were used in this literature search: Emerald Insight, Oxford University Press, Sage Journals, Science Direct, Springer Link, Taylor and Francis Online, and Wiley Online Library. The search of academic press websites was conducted for the most recent studies, published since January 2022, to supplement the results of the EconLit search. The final search of literature was conducted in March 2023.

[2] The bibliography of these 168 selected research works is shown in **Supplement**.

of the 168 studies selected, 120 are classified as FI studies, while 90 fall into the category of DF studies. Forty-two papers are both FI and DF studies. From the 168 selected works, we extracted a total of 1693 estimates. The mean and median of estimates per study are 10.1 and 5.5, respectively. Of 1693 collected estimates, 918 present estimation results of bank credit to GDP and 775 present those of market capitalization. Hereafter, K denotes the total number of collected estimates.

To test the hypothesis from a multiangle perspective, in addition to a meta-analysis using all 1693 collected estimates, we also synthesize and compare the estimates by period referring to average estimation year, by target economy, and by target region. To this end, we divide the collected estimates into three subsamples by average estimation year with thresholds of 1990 and 2000, four subsamples by economy type, and five subsamples by region. As indicated in **Table 1**, except for DF studies of Latin America and the Caribbean, all subsamples contain a sufficient number of estimates.

3.2 Methodology of Meta-Analysis

Next, we provide a brief description of the methodology of meta-analysis. This paper performs a meta-analysis according to internationally established standard procedures (Stanley and Doucouliagos, 2012; Iwasaki, 2020) and the reporting guidelines published in Havránek et al. (2020).

To synthesize and compare estimates derived from the selected studies, we employ the partial correlation coefficient (PCC). The PCC is a unitless measure of the association of a dependent variable and the independent variable in question when other variables are held constant. When t_k and df_k denote the t value and the degree of freedom of the k-th estimate (k = 1, 2, …, K), respectively, the PCC (r_k) is calculated with the following equation:

$$r_k = \frac{t_k}{\sqrt{t_k^2 + df_k}}. \quad (1)$$

We synthesize PCCs using the meta fixed-effect model and meta random-effects model. According to Cochran's Q test of homogeneity and I^2 and H^2 heterogeneity measures, we adopt the synthesized effect size of one of these two models. In addition to the conventional research synthesis methods, we also utilize the unrestricted weighted least squares average (UWA), and the weighted average of the adequately powered (WAAP). According to Stanley and Doucouliagos (2017) and Stanley et al. (2017), the UWA is less subject to influence from excess heterogeneity than is the meta fixed-effect model. The UWA method regards as the synthesized effect size a point estimate obtained from the regression that takes the standardized effect size as the dependent variable and the estimation precision as the independent variable. Specifically, we estimate Eq. (2), in which there is no intercept term, and the coefficient, α, is utilized as the synthesized value of the collected estimates in question:

$$t_k = \alpha(1/SE_k) + \varepsilon_k, \quad (2)$$

where SE_k is the standard error of the k-th estimate, and ε_k is a residual term. In theory, α in Eq. (2) is consistent with the estimate of the meta fixed-effect model.

Further, Stanley et al. (2017) proposed conducting a UWA of estimates, the statistical power of which exceeds the threshold of 0.80, and called this estimation method "the weighted average of the adequately powered (WAAP)." They stated that WAAP synthesis has less publication selection bias than the traditional meta random-effects model. Accordingly, we adopt the WAAP estimate as the best synthesis value whenever available. Otherwise, the traditional synthesized effect size is used as the second-best reference value.

Following the synthesis of collected estimates, we conduct an MRA to explore the factors causing heterogeneity between the selected studies. More concretely, we estimate a meta-regression model:

$$y_k = \beta_0 + \sum_{n=1}^{N} \beta_n x_{kn} + \beta_{SE} SE_k + e_k, \quad (3)$$

where y_k is the k-th estimate, β_0 is the constant, x_{kn} denotes a meta-independent variable (also known as a moderator) that captures the relevant characteristics of an empirical study and explains its systematic variation from other empirical results in the literature, β_n denotes the meta-regression coefficient to be estimated. β_{SE} expresses the coefficient of SE, and e_k is the meta-regression disturbance term.

There is no clear consensus among meta-analysts about the best model for estimating Eq. (3) (Iwasaki et al., 2020; Ono and Iwasaki, 2022). Hence, to check the statistical robustness of coefficient β_n, we perform an MRA using the following six estimators: (1) the cluster-robust weighted least squares (WLS), which clusters the collected estimates by study, computes robust standard errors, and is weighed by the inverse of standard error ($1/SE$) as a measure of estimate precision; (2) the cluster-robust WLS weighed by the degrees of freedom to account for sample-size differences among the studies; (3) the cluster-robust WLS weighed by the inverse of the number of estimates in each study to avoid the domination of the results by studies with large numbers of estimates; (4) the multi-level mixed-effects RLM estimator; (5) the cluster-robust random-effects panel generalized least squares (GLS) estimator; and (6) the cluster-robust fixed-effects panel least squares dummy variable (LSDV) estimator. We report either a random-effects panel model or a fixed-effects panel model, according to the Hausman test of model specification.

As Havranek and Sokolova (2020) and Zigraiova et al. (2021) argued, MRA involves the issue of model uncertainty, in the sense that the true model cannot be identified in advance. In addition, there is a high risk that the simultaneous estimation of multiple meta-independent variables could lead to multicollinearity. Accordingly, we estimate the posterior inclusion probability (PIP) and t value of each meta-independent variable other than the variables needed for hypothesis testing and the standard error of PCCs using the Bayesian model averaging (BMA) estimator and the weighted-average least squares (WALS) estimator, respectively, adopting a policy of employing variables for which the estimates have a PIP of 0.50 or more in the BMA analysis and a t value of 1.00 or more in the WALS estimation as selected moderators in Eq. (3).

As the final stage of meta-analysis, we examine publication selection bias using a funnel plot and by performing an MRA test procedure consisting of a funnel-asymmetry test (FAT), a precision-effect test (PET), and a precision-effect estimate with standard error (PEESE) approach, which were proposed by Stanley and Doucouliagos (2012) and have been used widely in previous meta-studies.

A funnel plot is a scatter plot with the effect size (in the case of this paper, PCC) on the horizontal axis and the precision of the estimate (in the case of this paper, $1/SE$) on the vertical axis. In the absence of publication selection bias, effect sizes reported by independent studies vary randomly and symmetrically around the true effect size. Moreover, according to the statistical theory, the dispersion of effect sizes is negatively correlated with the precision of the estimate. Therefore, the shape of the plot must look like an inverted funnel. In other words, if the funnel plot is not bilaterally symmetrical but is deflected to one side, then an arbitrary manipulation of the study area in question is suspected, in the sense that estimates in favor of a specific conclusion (i.e., estimates with an expected sign and/or are statistically significant) are more frequently published.

The FAT and PET have been developed to test publication selection bias and the presence of genuine evidence in a more rigid manner: FAT can be performed by regressing the t value of the k-th estimate on $1/SE$ using Eq. (4), thereby testing the null hypothesis that the intercept term γ_0 is equal to zero:

$$t_k = \gamma_0 + \gamma_1(1/SE_k) + v_k, \quad (4)$$

where v_k is the error term. When the intercept term γ_0 is statistically significantly different from zero, we can interpret that the distribution of the effect sizes is asymmetric.

Even if there is publication selection bias, a genuine effect may exist in the available empirical evidence. Stanley and Doucouliagos (2012) proposed examining this possibility by testing the null hypothesis that the coefficient γ_1 is equal to zero in Eq. (4). The rejection of the null hypothesis implies the presence of a genuine effect. γ_1 is the coefficient of precision; therefore, it is called a PET.

Furthermore, Stanley and Doucouliagos (2012) also stated that an estimate of the publication selection bias–adjusted effect size can be obtained by estimating the following equation (5), which has no intercept. If the null hypothesis of $\varphi_1 = 0$ is rejected, then the nonzero true effect does actually exist in the literature, and the coefficient φ_1 can be regarded as its estimate.

$$t_k = \varphi_0 SE_k + \varphi_1(1/SE_k) + w_k, \quad (5)$$

where w_k is the error term. This is the PEESE approach.

To test the robustness of the coefficients obtained from the above FAT–PET–PEESE procedure, we estimate Eqs. (4) and (5) using not only the unrestricted WLS estimator, but also the WLS estimator with bootstrapped standard errors, the cluster-robust WLS estimator, and the unbalanced panel estimator for a robustness check. In addition to these four models, we also run an instrumental variable (IV) estimation with the inverse of the square root of the number of observations used as an instrument of the standard error, because "the standard error can be endogenous if some method choices affect both the estimate and the standard error. Moreover, the standard error is estimated, which causes attenuation bias in meta-analysis" (Cazachevici et al., 2020, p. 5).

In recent years, some advanced techniques for estimating the publication selection bias–corrected effect size have been developed that are comparable to the PEESE approach. They include the "Top 10" approach, proposed by Stanley, Jarrell, and Doucouliagos (2010), who discovered that discarding 90% of the published findings greatly reduces publication selection bias and is often more efficient than conventional summary statistics; the selection model, developed by Andrews and Kasy (2019), which tests for publication selection bias using the conditional probability of publication as a function of a study's results; the endogenous kinked model, innovated by Bom and Rachinger (2019), which presents a piecewise linear meta-regression of estimates of their standard errors, with a kink at the cutoff value of the standard error below which publication selection bias is unlikely; and the *p*-uniform method, introduced by van Aert and van Assen (2021), which is grounded on the statistical theory that the distribution of *p*-values is uniform conditional on the population effect size. In this paper, following the practices of precedent in Iwasaki (2022) and Ono and Iwasaki (2022), we apply these four methods to provide alternative estimates of the publication selection bias–corrected effect size and compare them with the PEESE estimates for a robustness check.

4 Meta-Analysis

In this section we conduct a meta-analysis of the 1693 collected estimates in accordance with the procedures and methodology described in the previous section. Subsection 4.1 synthesizes the collected estimates. Subsection 4.2 performs an MRA of literature heterogeneity. Lastly, Subsection 4.3 tests for publication selection bias.

4.1 Meta-Synthesis

As the first step of meta-analysis, this subsection conducts a meta-synthesis of the collected estimates.

First, we consider the distribution of the estimates. **Table 2** shows the descriptive statistics and the results of the *t* mean test and univariate comparison of FI and DF studies for estimates extracted from all 168 selected works as well as those grouped by average estimation year, target economy, and target region. **Figure 1** shows the kernel density estimation corresponding to the categories adopted in **Table 2**.

According to **Table 2**, the means of all FI and DF studies are 0.025 and 0.099, respectively. The *t* test rejects the null hypothesis of zero mean at the 1% significance level in both cases, suggesting that the selected works as a whole tend to show that both financial intermediation and direct financing are likely to promote macroeconomic growth. At the same time, univariate comparisons by *t* test and Kruskal–Wallis rank sum test indicate that the mean and median of all DF studies statistically significantly exceed those of all FI studies. Panel (a) of **Figure 1** corresponds with this finding by showing that the kernel density estimation of the DF study is more positively biased than that of the FI study. These results are well in line with our hypothesis that direct financing outperforms financial intermediation from the viewpoint of a growth-enhancing effect.

Comparing the FI and DF studies by average estimation year, by target economy, and by target region using the same approach as in the case of all of the studies mentioned above, we find that the mean and median of reported estimates in the DF studies always surpass those in the FI studies, with the exception of when the study subjects are from

1989 or before, in developing economies, or in Latin America and the Caribbean. Furthermore, it is noteworthy that, in the nine cases where univariate analysis proves the superiority of DF studies over FI studies, the difference in the mean and median between the two is markedly large. In other words, the overall trend observed in all studies is often replicated, even when we restrict the estimation period, economy type, and region as we expect.

Keeping the above findings in mind, we turn next to the results of the meta-synthesis. The left column of **Table 3** reports synthesis results using a meta fixed-effect model and a meta random-effects model, while the center column reports results of the heterogeneity test and measures. As shown in the latter, Cochran's Q test of homogeneity rejects the null hypothesis at the 1% significance level, and the I^2 and H^2 statistics indicate the presence of heterogeneity among the studies concerned in all cases in both Panels (a) and (b). Accordingly, we adopt the estimates of the random-effects model as a reference value of the traditional synthesis approach.

The right column of **Table 3** exhibits results of the UWA and WAAP synthesis. Although in theory the UWA synthesis generates the same point estimate as that of the transitional fixed-effect model, the t value of the former falls notably below that of the latter, suggesting that the UWA method is less influenced by excess heterogeneity than the fixed-effect model. With respect to the WAAP synthesis results, Panel (a) shows that only three of 13 cases successfully synthesize collected estimates using this new method due to limited number of adequately powered estimates in FI studies. Meanwhile, as shown in Panel (b), seven cases in the DF studies can generate a WAAP synthesis value. This contrast between the FI and DF studies likely results from the fact that empirical results of the DF study were obtained with greater precision than were those of the FI study, as suggested by the median statistical power reported in the respective panels. In accordance with the selection rule of synthesis results described in Subsection 3.2, we adopt the WAAP estimates in the above 10 cases as the best synthesis values.

Figure 2 compares the FI and DF studies using the adopted synthesized values. According to the standards of Doucouliagos (2011) regarding the evaluation of PCCs in macroeconomics research,[3] the WAAP synthesis value of 0.134 for all DF studies implies that the growth-enhancing effect of market capitalization reaches an economically

[3] As the evaluation criteria of the correlation coefficient, Doucouliagos (2011) proposed 0.104, 0.226, and 0.386 to be the lowest thresholds of small, medium, and large effects, respectively, as general standards in macroeconomic research (ibid., Table 3, p. 11).

meaningful scale, while the random-effects synthesis value of 0.022 for all FI studies indicates that the impact of bank credit on GDP growth is economically negligible. This result strongly supports our hypothesis.

Results similar to the comparison of all studies are observed when the study subject is restricted to advanced economies, emerging market economies, and Asia. In other cases, the difference in the adopted synthesis value between the FI and DF studies is much smaller. However, even in most of these cases, the picture repeats itself, with the synthesized effect size of DF studies exceeding that of FI studies. The two exceptions are when the average estimation year is limited to 1989 or before and when the target region is restricted to Latin America and the Caribbean. These results well correspond with those discussed above referring to **Table 2** and **Figure 1**.

4.2 Meta-Regression Analysis

In this subsection, as the second step of meta-analysis, we estimate Eq. (3) to identify the effects of literature heterogeneity on the empirical results of selected studies. Through MRA, we test whether the meta-synthesis results reported in **Table 3** and **Figure 1** are reproduced even after controlling for a set of study conditions simultaneously.

As described in Subsection 3.2, we introduce the PCCs of the collected estimates into the left-hand side of Eq. (3), while a total of 31 meta-independent variables are employed on the right-hand side. They consist of variables that capture the differences in the number of countries studied, data type, estimator, types and attributes of economic growth variables, attributes of financial variables, selection of control variables, and presence of treatment of endogeneity, in addition to the variable of DF studies that aims to test the hypothesis, the variables of average estimation year, target economy and region, as well as standard errors of PCCs. **Table 4** lists the names, definitions, and descriptive statistics of these 31 meta-independent variables.

In order to tackle the issue of model uncertainty in MRA, we first estimated the posterior inclusion probability (PIP) and the *t* value of each meta-independent variable, using the BMA estimator and WALS estimator, respectively. **Table 5** shows the results. Here, the variables from DF study to *SE* are treated as focus regressors, while the remaining meta-independent variables—from the number of target countries to the treatment of endogeneity—are handled as auxiliary regressors. According to the selection criteria mentioned in Subsection 3.2, we adopt five variables—panel data, real GDP, with a squared term, trade openness, and initial conditions—as selected moderators.

Next, we perform MRA with the above-mentioned focus regressors and selected moderators in the right-hand side of Eq. (3) using six different estimators. The estimation results are exhibited in **Table 6**.[4] According to the Hausman test of model specification, the fixed-effects panel LSDV model is omitted from the report. As shown in this table, estimates are sensitive to the choice of estimator. Therefore, we assume that meta-independent variables that are statistically significant and have the same sign in at least three of five models constitute robust estimates.

From **Table 6**, we find that the variable of DF study is estimated to be significant and positive in all five models, indicating that, *ceteris paribus*, DF studies tend to report effect sizes on economic growth that are larger than those of FI studies by a range of 0.0651 to 0.0975. These results strongly verify our prediction that direct financing is superior to financial intermediation in terms of its effect on GDP growth.

Further, we repeat the same procedure to estimate the variable of DF study with control for *SE* and selected moderators by estimation period, economy type, and region. The results in **Table 7** reveal that the hypothesis is robustly supported in studies where the average estimated year is 1990 or later, in studies of worldwide economies, and in studies of the whole world. In other words, our prediction is not necessarily supported if the average estimated year is 1989 or earlier or if the study target is limited to a specific economic type or a region.

The MRA performed in this subsection proves our hypothesis selectively. We will revisit the above results later.

4.3 Test of Publication Selection Bias

As the final step of meta-analysis, in this subsection, we test for publication selection bias and the presence of genuine evidence in the selected literature.

Panel (a) of **Figure 3** displays the funnel plot of estimates collected from FI studies. The panel is visually appealing, in that the estimates reported in the selected works form an ideal distribution from the viewpoint of statistical theory, which states that the shape of the plot must look like an inverted funnel in the absence of publication selection bias. However, if the true effect is assumed to be zero, as the dotted line in **Figure 3** depicts, the ratio of positive to negative estimates is 525:393; therefore, the null hypothesis that the number of positive estimates equals that of negative ones is rejected by a goodness-of-fit test ($z = 4.356$, $p = 0.000$). If the random-effects synthesis value reported in **Table 3** is assumed to be the approximate value of the true effect, as drawn by the solid line in

[4] **Appendix Table A1** reports estimation results with all moderators,

Figure 3, the estimates have a ratio of 432:486, with a value of 0.022 being the threshold; therefore, the null hypothesis that the ratio of estimates below the random-effects synthesis value versus those over it is 50:50 is again rejected (z = 1.782, p = 0.075). In summary, the goodness-of-fit test suggests that there is a risk of publication selection bias in FI studies.

The plot of estimates extracted from DF studies in Panel (b) of **Figure 3** also shows an inverted funnel shape. However, goodness-of-fit tests do not support this visual impression. Actually, the ratio of positive to negative estimates is 599:176; thus, the null hypothesis that the number of positive estimates equals that of negative ones is strongly rejected (z = 15.195, p = 0.000). Meanwhile, under the assumption that the WAAP synthesis value serves as the approximate value of the true effect, the estimates are divided into 304 versus 471 using 0.134 as the reference value. Accordingly, the null hypothesis of equal proportion is rejected again (z = -5.998, p = 0.000), suggesting that publication selection is very likely in DF studies irrespective of the different assumptions of the true effect.

The FAT–PET–PEESE procedure endorses the results of the goodness-of-fit test. In fact, as Panel (a) of **Table 8** shows, the null hypothesis that the intercept γ_0 is zero is rejected by the FAT in three of five models, implying a high likelihood of publication selection bias in FI studies. Even when funnel symmetry is not present, however, the selected studies may contain genuine evidence. Actually, the PET rejects the null hypothesis that the coefficient of the inverse of the standard errors (γ_1) is zero in three models, meaning that the collected estimates likely contain evidence of a true effect of bank credit on economic growth. Nevertheless, the PEESE approach in Panel (b) of **Table 8** shows that the coefficient (φ_1) is not statistically significantly different from zero in any of the five models. Hence, we judge that the selected literature fails to provide evidence of a genuine empirical effect of bank credit.

FAT–PET–PEESE tests produce contrasting results for DF studies. Namely, in **Table 9**, the FAT rejects the null hypothesis in the five models, thus, proving that publication selection bias does exist in the literature. Despite artificial selection and the manipulation of empirical results in selected works, however, the PET finds genuine evidence of the true effect of direct financing, and the PEESE approach successfully generates a publication selection bias–adjusted effect size, indicating that the real impact of market capitalization should range between 0.0604 and 0.1861 in terms of PCC.

As pointed out in the previous section, in addition to the PEESE approach, four advanced meta-analytic techniques exist for estimating a genuine effect beyond publication selection bias. For a robustness check, therefore, we performed these alternative estimations of the publication selection bias–corrected effect size. **Table 10** shows the results. In Panel (a) of the table, Models [1] and [2] fail to generate a statistically significant publication selection bias–corrected effect size, while Models [3] and [4] produce a significant but negative estimate for FI studies. Meanwhile, in Panel (b), although the synthesis value varies depending on the applied method, to some extent, all of the estimates demonstrate the existence of a significant and positive effect of direct financing on economic growth and, accordingly, backup the test results in **Table 9**.

We also carried out the FAT–PET–PEESE procedure by estimation period, economy type, and region. These additional test results are summarized in **Table 11**, along with those reported in **Tables 8** and **9**. With regard to FI studies, the PET rejects the null hypothesis of the nonexistence of genuine evidence in seven of twelve cases, and the PEESE approach generates a nonzero publication selection–adjusted effect size for four of these seven cases. With respect to DF studies, we find genuine empirical evidence in seven cases in the same manner. It is noteworthy, in this regard, that the PEESE estimates obtained for the above eleven cases are highly compatible with the corresponding selected synthesis values in **Table 3**; therefore, the test results of publication selection bias in this subsection partially backup the meta-synthesis results reported in Subsection 4.1.

5 Conclusions

Did financial intermediation and direct financing foster economic growth under dramatically changing economic circumstances around the world, especially after the collapse of planned economies? Were there differences in the growth-enhancing effects of financial intermediation and direct financing by estimation year, region, and national income level? To answer these questions, we performed a meta-analysis of the extant literature to identify the true effect size of financial intermediation and direct financing in the world and tested a hypothesis regarding the effect size of finance on growth between different target countries, estimation periods, and study areas.

A meta-synthesis of 1693 estimates collected from 168 selected studies conforms to the hypothesis, suggesting that the growth-enhancing effect of direct financing is highly likely to exceed that of financial intermediation, *ceteris paribus*. The two exceptions are when the average estimation year is limited to 1989 or before and when the target region is restricted to Latin America and the Caribbean.

Moreover, the following MRA revealed that direct financing is superior to financial intermediation in terms of its effect on GDP growth. However, when we repeat the same procedure to estimate the variable of DF study, our prediction is not necessarily supported if the study target is limited to a specific estimated year, economic type, or region.

Next, we tested for publication selection bias and the presence of genuine evidence in the selected literature. The goodness-of-fit test suggests that there is a risk of publication selection bias in FI studies, whereas publication selection bias is very likely in DF studies irrespective of the difference in assumption of the true effect.

In accordance with the FAT–PET–PEESE results, we judge that the selected literature fails to provide evidence of a genuine empirical effect of bank credit. As for DF studies, the FAT proves that publication selection bias does exist in the literature, while the PET finds genuine evidence of the true effect of direct financing, and the PEESE successfully generates the publication selection bias–adjusted effect size.

We also carried out the FAT–PET–PEESE procedure by estimation period, economy type, and region. The hypothesis that the growth-enhancing effect of direct financing outperforms that of financial intermediation is supported in 2000 and later.

Table 12 demonstrates that, in 2000 and later, the hypothesis that the growth-enhancing effect of direct financing outperforms that of financial intermediation is supported in all aspects of meta-synthesis, meta-regression analysis, and testing for publication selection bias and the presence of genuine empirical evidence. Therefore, we can derive the following policy implications from the results of meta-analysis: At the present time, each country could enhance its economic growth by developing its direct financing infrastructure, specifically by boosting incentives for companies to disclose information, prompting corporate governance through monitoring by shareholders, and providing channels for trading, pooling, and diversifying risks.

The results of meta-analysis in this paper, summarized above, show that insufficient research findings have been accumulated to ascertain the true nature of the growth-enhancing effects of financial intermediation and direct financing. For this reason, as implied by the low median statistical power of collected estimates shown in Column (C) of Table 3, further research is needed to develop empirical results with higher precision. Thus, it is hoped that empirical research on financial intermediation and direct financing will continue to advance with regard to both developing and advanced economies around the world. We would like to revisit the topic based on further accumulated empirical evidence.

References

Allen, F., Gale, D. 1997. Financial markets, intermediaries, and intertemporal smoothing. Journal of Political Economy 105(3): 523-546.

Allen, F., Gale, D. 1999. Diversity of opinion and financing of new technologies. Journal of Financial Intermediation 8(1-2): 68-89.

van Aert, R.C., van Assen, M. 2021. Correcting for Publication Bias in a Meta-Analysis with the *P*-uniform Method. Working paper, Tilburg University and Utrecht University.

Andrews, I., Kasy, M. 2019. Identification of and correction for publication bias. American Economic Review 109(8): 2766–2794.

Anwar, A, Iwasaki, I. 2022. The finance–growth nexus in the Middle East and Africa: A comparative meta-analysis. International Journal of Finance & Economics. (Early View: https://doi.org/10.1002/ijfe.2670)

Anwar, A, Iwasaki, I. 2023. The finance–growth nexus in Asia: A meta-analytic approach. Asian Development Review 40(1): 13-48.

Asongu, S. A. 2015. Finance and growth: New evidence from meta-analysis. Managerial Finance 41(6): 615-639.

Arestis, P., Chortareas, G., Magkonis, G. 2015. The financial development and growth nexus: A meta-analysis. Journal of Economic Surveys 29(3): 549–565.

Bijlsma, M., Kool, C., Non, M. 2018. The effect of financial development on economic growth: A meta-analysis. Applied Economics 50(57): 6128-6148.

Boyd, J.H., Prescott, E.C. 1986. Financial intermediary-coalitions. Journal of Economic Theory 38(2): 211-232.

Bom, P. R. D., Rachinger, H. 2019. A kinked meta-regression model for publication bias correction. Research Synthesis Methods 10(4): 497–514.

Brada, J., Iwasaki, I. 2023. Does financial liberalization spur economic growth? A meta-analysis. Borsa Istanbul Review. (Early View: https://doi.org/10.1016/j.bir.2023.10.015)

Bumann, S., Hermes, N., Lensink, R. 2013. Financial liberalization and economic growth: A meta-analysis. Journal of International Money and Finance 33: 255-281.

Cazachevici, A., Havranek, T., Horvath, R. 2020. Remittances and economic growth: A meta-analysis. World Development 134, Article 105021.

Diamond, D.W. 1984. Financial intermediation and delegated monitoring. Review of Economic Studies 51: 393-414.

Doucouliagos, H. 2011. How Large is Large? Preliminary and Relative Guidelines for Interpreting Partial Correlations in Economics, School Working Paper No. SWP 2011/5. School of Accounting, Economics and Finance, Faculty of Business and Law, Deakin University, Melbourne.

de la Fuente, A., Marín, J.M. 1996. Innovation, bank monitoring, and endogenous financial development. Journal of Monetary Economics 38: 269-301.

Greenwood, J., Jovanovic, B. 1990. Financial development, growth, and the distribution of income. Journal of Political Economy 98: 1076-1107.

Greenwood, J., Smith, B. 1996. Financial markets in development, and the development of financial markets. Journal of Economic Dynamics and Control 21: 145-181.

Grossman, S.J., Stiglitz, J. 1980. On the impossibility of informationally efficient markets. American Economic Review 70: 393-408.

Guo, F., He, S. 2020. The finance-growth nexus in China: A meta-analysis. Applied Economics Letters 27(13): 1071-1075.

Gurley, J., Shaw, E. 1960. Money in Theory of Finance. Washington, D.C.: Brookings Institution.

Havránek, T., Stanley, T. D., Doucouliagos, H., Bom, P., Geyer-Klingeberg, J., Iwasaki, I., Reed, W. R., Rost, K., van Aert, R. C. M. 2020. Reporting guidelines for meta-analysis in economics. Journal of Economic Surveys 34: 469-475.

Havranek, T., Sokolova, A. 2020. Do consumers really follow a rule of thumb? Three thousand estimates from 144 studies say "Probably not." Review of Economic Dynamics 35: 97-122.

Hellwig, M. (1991). "Banking, financial intermediation, and corporate finance". In: Giovanni, A., Mayer, C. (Eds.), European Financial Integration. Cambridge University Press, Cambridge, UK, pp. 35–63.

Holmström, B., Tirole, J. 1993. Market liquidity and performance monitoring. Journal of Political Economy 101(4): 678-709.

Iwasaki, I. 2020. Meta-analysis of emerging markets and economies: An introductory note for the special issue. Emerging Markets Finance & Trade 56(1): 1-9.

Iwasaki, I., 2022. The finance-growth nexus in Latin America and the Caribbean: A meta-analytic perspective. World Development 149, Article 105692.

Iwasaki, I., Kočenda, E., 2023. Quest for the general effect size of finance on growth: A large meta-analysis of worldwide studies. Empirical Economics. (Early View: https://doi.org/10.1007/s00181-023-02528-1)

Iwasaki, I., Ma, X., Mizobata, S. 2020. Corporate ownership and managerial turnover in China and Eastern Europe: A comparative meta-analysis. Journal of Economics and Business 111, Article 105928.

Iwasaki, I., Ono, S. 2023. Economic development and the finance–growth nexus: A meta-analytic approach. Applied Economics. (Early View: https://doi.org/10.1080/00036846.2023.2289921)

Levine, R. 1991. Stock markets, growth, and tax policy, Journal of Finance 46(4): 1445-1465.

Levine, R. 2002. Bank-based or market-based financial systems: which is better?, Journal of Financial Intermediation 11(4): 398-428.

Levine, R. 2005. Finance and growth: theory and evidence, Handbook of Economic Growth, Volume 1, Part A: 865-934.

Obstfeld, M. 1994. Risk-taking, global diversification, and growth. American Economic Review 84: 1310-1329.

Ono, S., Iwasaki, I. 2022. The finance-growth nexus in Europe: A comparative meta-analysis of emerging markets and advanced economies. Eastern European Economics 60(1): 1-49.

Rajan, R.G. 1992. Insiders and outsiders: The choice between informed and arm's-length debt. Journal of Finance 47: 1367-1400.

Saint-Paul, G. 1992. Technological choice, financial markets and economic development. European Economic Review 36(4): 763-781.

Scharfstein, D. 1988. The disciplinary role of takeovers. Review of Economic Studies 55: 185-199.

Schumpeter, J. A. 1911. The Theory of Economic Development. Oxford University Press, Oxford.

Sirri, E. R. Tufano, P. 1995. The economics of pooling, In: Crane, D. B., Merton, R. C., Froot, K. A., Bodie, Z., Mason, S. P., Sirri, E. R., Perold, A. F., Tufano, P. (Eds.), The Global Financial System: A Functional Approach, Harvard Business School Press, Boston, 81-127.

Smith, A. 1776. An Inquiry into the Nature and Causes of the Wealth of Nations. W. Stahan & T. Cadell, London.

Stanley, T. D., Doucouliagos, H. 2012. Meta-Regression Analysis in Economics and Business. Routledge, London and New York.

Stanley, T. D., Doucouliagos, H. 2017. Neither fixed nor random: Weighted least squares meta-regression. Research Synthesis Method 8(1): 19-42.

Stanley, T. D., Doucouliagos, H., Ioannidis, J. P. A. 2017. Finding the power to reduce publication bias. Statistics in Medicine 36(10): 1580–1598.

Stanley, T. D., Jarrell, S. B., Doucouliagos, H. 2010. Could it be better to discard 90% of the data? A statistical paradox. The American Statistician 64: 70–77.

Sussman, O. 1993. A theory of financial development. In: Giovannini, A. (Ed.), Finance and Development: Issues and Experience, Cambridge University Press, Cambridge, 29-64.

Valickova, P., Havranek, T., Horvath, R. 2015. Financial development and economic growth: A meta-analysis. Journal of Economic Surveys 29(3): 506–526.

Zigraiova, D., Havranek, T., Irsova, Z., Novak, J. 2021. How puzzling is the forward premium puzzle? A meta-analysis. European Economic Review 134, Article 103714.

Table 1. Overview of selected works and collected estimates

Study type	Number of works	Number of collected estimates (K)	Breakdown of collected estimates by average estimation year			Breakdown of collected estimates by target economy				Breakdown of collected estimates by target region					Average number of estimates per study	Median number of estimates per study
			1989 or before	Between 1990 and 1999	2000 or later	Advanced economies	Developing economies	Emerging market economies	Worldwide economies	Europe	Latin America and the Carribean	Asia	Africa	Whole world		
All studies	168	1693	324	592	777	515	637	121	420	388	32	123	314	836	10.1	5.5
FI studies	120	918	188	333	397	247	387	61	223	175	29	67	189	458	7.7	4
DF studies	90	775	136	259	380	268	250	60	197	213	3	56	125	378	8.6	4

Note: 42 works conducted both FI and DF studies.

Table 2. Descriptive statistics of the partial correlation coefficients, *t* test of collected estimates, and univariate comparison of FI and DF studies

Study type	FI studies							DF studies							Univariate comparison of FI and DF studies	
	K	Mean	Median	S.D.	Max.	Min.	*t* test[a]	*K*	Mean	Median	S.D.	Max.	Min.	*t* test[a]	*t* test[b]	Kruskal–Wallis rank sum test[c]
All studies	918	0.025	0.035	0.222	0.778	-0.735	3.414 ***	775	0.099	0.095	0.171	0.790	-0.724	16.1159 ***	-7.581 ***	63.644 ***
1989 or before	188	0.099	0.098	0.274	0.772	-0.735	4.982 ***	136	0.076	0.086	0.218	0.790	-0.500	4.0341 ***	0.845	1.968
Between 1990 and 1999	333	0.014	0.005	0.220	0.778	-0.688	1.161	259	0.105	0.087	0.185	0.769	-0.724	9.1327 ***	-5.326 ***	33.301 ***
2000 or later	397	-0.001	0.020	0.186	0.531	-0.678	-0.111	380	0.104	0.107	0.139	0.700	-0.585	14.4982 ***	-8.857 ***	71.88 ***
Advanced economies	247	0.057	0.075	0.200	0.769	-0.674	4.507 ***	268	0.111	0.111	0.120	0.769	-0.384	15.2262 ***	-3.744 ***	13.331 ***
Developing economies	387	0.035	0.051	0.218	0.778	-0.688	3.187 ***	250	0.070	0.061	0.216	0.790	-0.724	5.0942 ***	-1.937 ***	2.106
Emerging market economies	61	-0.020	-0.062	0.176	0.423	-0.290	-0.885	60	0.202	0.185	0.214	0.700	-0.244	7.3145 ***	-6.234 ***	31.521 ***
Worldwide economies	223	-0.017	-0.050	0.253	0.772	-0.735	-0.980	197	0.089	0.090	0.136	0.566	-0.500	9.115 ***	-5.201 ***	35.347 ***
Europe	175	0.053	0.064	0.183	0.769	-0.674	3.821 ***	213	0.098	0.107	0.137	0.700	-0.384	10.4868 ***	-2.789 ***	9.021 ***
Latin America and the Carribean	29	0.161	0.122	0.217	0.595	-0.398	4.008 ***	3	-0.253	-0.037	0.409	0.002	-0.724	-1.0723	2.913 ***	5.568 **
Asia	67	0.053	0.032	0.247	0.778	-0.486	1.766 *	56	0.232	0.244	0.207	0.769	-0.244	8.4091 ***	-4.294 ***	17.153 ***
Middle East and Africa	189	-0.004	-0.015	0.230	0.531	-0.669	-0.252	125	0.102	0.087	0.239	0.790	-0.585	4.7591 ***	-3.927 ***	19.254 ***
Whole world	458	0.014	0.047	0.225	0.772	-0.735	1.296	378	0.082	0.083	0.141	0.566	-0.500	11.2783 ***	-5.128 ***	23.467 ***

Notes:

[a] *** and * denote that the null hypothesis that the mean is zero is rejected at the 1% and 10% levels, respectively.

[b] *** denotes that the null hypothesis that the mean is equal between FI and DF studies is rejected at the 1% level.

[c] *** and ** denote that the null hypothesis that samples are from the same population between FI and DF studies is rejected at the 1% and 5% levels, respectively.

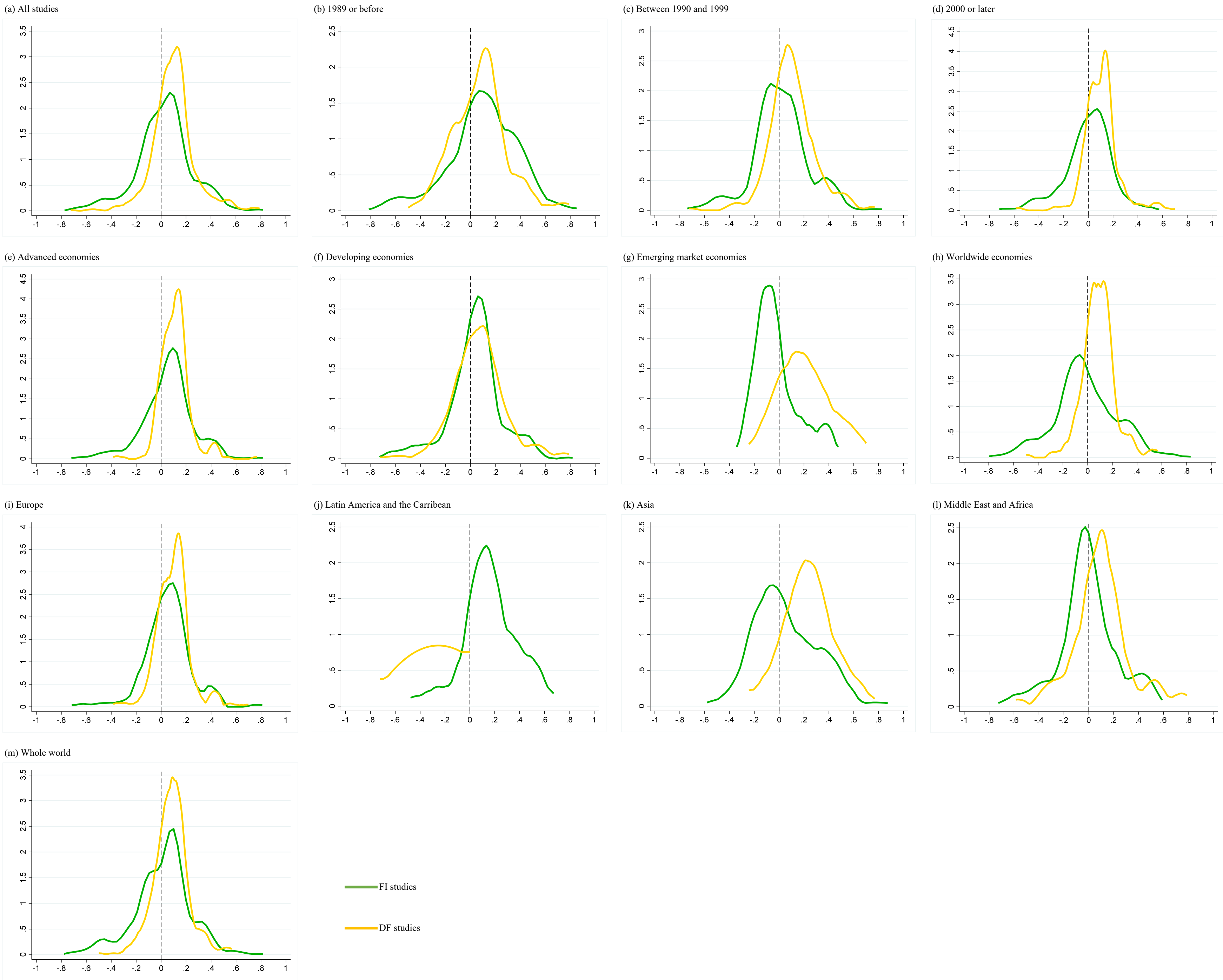

Figure 1. Kernel density estimation of collected estimates by study type

Note: The vertical axis is the kernel density. The horizontal axis is the partial correlation coefficient of the collected estimates. See Table 2 for descriptive statistics of the collected estimates.

Table 3. Synthesis of collected estimates

(a) FI studies

	Number of estimates (*K*)	Traditional synthesis: Fixed-effect model (*z* value)[a]	Traditional synthesis: Random-effects model (*z* value)[a]	Heterogeneity test and measures: Cochran's *Q* test of homogeneity (*p* value)[b]	Heterogeneity test and measures: I^2 statistic[c]	Heterogeneity test and measures: H^2 statistic[d]	UWA: UWA of all estimates (*t* value)[a, e]	UWA: Number of the adequately powered estimates[f]	UWA: WAAP (weighted average of the adequately powered estimates) (*t* value)[a]	UWA: Median *SE* of estimates (MSE)	UWA: Median statistical power (MSP)
All studies	918	-0.010 *** (-5.72)	**0.022** *** **(3.21)**	13845.9 *** (0.000)	92.89	14.06	-0.010 (-1.47)	0	- (-)	0.071	0.034
1989 or before	188	0.134 *** (29.57)	0.103 *** (5.82)	2203.6 *** (0.000)	92.26	12.92	0.134 *** (8.62)	37	**0.160** *** **(4.86)**	0.089	0.328
Between 1990 and 1999	333	-0.034 *** (-11.48)	**0.010** **(0.92)**	4782.4 *** (0.000)	92.16	12.76	-0.034 *** (-3.02)	0	- (-)	0.070	0.071
2000 or later	397	-0.032 *** (-14.00)	**-0.003** **(-0.34)**	5690.2 *** (0.000)	92.77	13.83	-0.032 *** (-3.69)	0	- (-)	0.064	0.073
Advanced economies	247	0.014 *** (4.05)	**0.052** *** **(4.71)**	2665.3 *** (0.000)	89.94	9.94	0.014 (1.23)	0	- (-)	0.070	0.039
Developing economies	387	0.036 *** (12.56)	**0.038** *** **(3.61)**	4977.5 *** (0.000)	91.81	12.21	0.036 *** (3.50)	0	- (-)	0.072	0.071
Emerging market economies	61	-0.070 *** (-8.42)	**-0.045** ** **(-2.49)**	215.1 *** (0.000)	76.30	4.22	-0.070 *** (-4.45)	0	- (-)	0.076	0.149
Worldwide economies	223	-0.068 *** (-23.26)	-0.025 (-1.64)	5234.6 *** (0.000)	95.91	24.48	-0.068 *** (-4.79)	10	**-0.101** **(-1.02)**	0.059	0.210
Europe	175	0.031 *** (7.55)	**0.046** *** **(4.28)**	773.4 *** (0.000)	82.57	5.74	0.031 *** (3.58)	0	- (-)	0.077	0.060
Latin America and the Carribean	29	0.207 *** (16.15)	0.158 *** (4.01)	303.9 *** (0.000)	88.19	8.47	0.207 *** (4.90)	12	**0.240** *** **(3.56)**	0.083	0.700
Asia	67	-0.008 (-1.16)	**0.034** **(1.22)**	446.4 *** (0.000)	92.06	12.6	-0.008 (-0.45)	0	- (-)	0.093	0.031
Middle East and Africa	189	0.016 *** (3.08)	**0.003** **(0.17)**	1450.2 *** (0.000)	88.18	8.46	0.016 (1.11)	0	- (-)	0.078	0.040
Whole world	458	-0.030 *** (-14.42)	**0.009** **(0.92)**	10368.2 *** (0.000)	94.88	19.54	-0.030 *** (-3.03)	0	- (-)	0.062	0.070

(b) DF studies

	Number of estimates (*K*)	Traditional synthesis: Fixed-effect model (*z* value)[a]	Traditional synthesis: Random-effects model (*z* value)[a]	Heterogeneity test and measures: Cochran's *Q* test of homogeneity (*p* value)[b]	Heterogeneity test and measures: I^2 statistic[c]	Heterogeneity test and measures: H^2 statistic[d]	UWA: UWA of all estimates (*t* value)[a, e]	UWA: Number of the adequately powered estimates[f]	UWA: WAAP (weighted average of the adequately powered estimates) (*t* value)[a]	UWA: Median *SE* of estimates (MSE)	UWA: Median statistical power (MSP)
All studies	775	0.073 *** (35.90)	0.091 *** (16.64)	4457.1 *** (0.000)	83.81	6.18	0.073 *** (14.96)	4	**0.134** * **(2.15)**	0.071	0.177
1989 or before	136	0.029 *** (6.23)	**0.061** *** **(3.67)**	1134.9 *** (0.000)	90.94	11.04	0.029 ** (2.15)	0	- (-)	0.060	0.069
Between 1990 and 1999	259	0.083 *** (22.50)	0.095 *** (9.98)	1211.3 *** (0.000)	81.74	5.48	0.083 *** (10.39)	7	**0.094** * **(2.14)**	0.072	0.210
2000 or later	380	0.084 *** (29.32)	0.100 *** (14.34)	1995.2 *** (0.000)	80.65	5.17	0.084 *** (12.78)	33	**0.044** *** **(2.89)**	0.072	0.216
Advanced economies	268	0.105 *** (26.12)	0.106 *** (16.83)	622.6 *** (0.000)	54.99	2.22	0.105 *** (17.11)	5	**0.170** ** **(3.46)**	0.073	0.298
Developing economies	250	-0.013 (-0.03)	**0.057** *** **(4.63)**	1744.8 *** (0.000)	88.18	8.46	-0.013 (-0.01)	0	- (-)	0.079	0.037
Emerging market economies	60	0.218 *** (25.01)	0.201 *** (7.17)	474.9 *** (0.000)	88.45	8.66	0.218 *** (8.81)	34	**0.226** *** **(6.87)**	0.072	0.858
Worldwide economies	197	0.080 *** (25.81)	0.083 *** (10.62)	930.1 *** (0.000)	80.79	5.21	0.080 *** (11.85)	25	**0.070** *** **(4.09)**	0.050	0.364
Europe	213	0.079 *** (15.94)	**0.086** *** **(11.90)**	417.5 *** (0.000)	47.44	1.9	0.079 *** (11.36)	0	- (-)	0.080	0.166
Latin America and the Carribean	3	-0.147 ** (-2.29)	**-0.256** **(-1.08)**	16.0 *** (0.000)	87.12	7.76	-0.147 (-0.81)	0	- (-)	0.158	0.152
Asia	56	0.244 *** (26.62)	0.224 *** (8.01)	413.9 *** (0.000)	87.96	8.3	0.244 *** (9.70)	42	**0.241** *** **(8.25)**	0.079	0.872
Middle East and Africa	125	0.041 *** (6.08)	**0.096** *** **(4.90)**	809.1 *** (0.000)	86.49	7.4	0.041 ** (2.38)	0	- (-)	0.097	0.062
Whole world	378	0.064 *** (26.11)	**0.074** *** **(10.84)**	2403.0 *** (0.000)	85.49	6.89	0.064 *** (10.34)	0	- (-)	0.059	0.193

Notes: Selected synthesized values are emphasized in bold. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. A dash denotes that the statistic is not available. See Table 2 for descriptive statistics of the collected estimates.

[a] Null hypothesis: The synthesized effect size is zero.

[b] Null hypothesis: Effect sizes are homogeneous.

[c] Ranges between 0 and 100% with larger scores indicating heterogeneity

[d] Takes zero in the case of homogeneity

[e] Synthesis method advocated by Stanley and Doucouliagos (2015) and Stanley et al. (2017)

[f] Denotes the number of estimates with statistical power of 0.80 or more, which is computed with reference to the UWA of all collected estimates

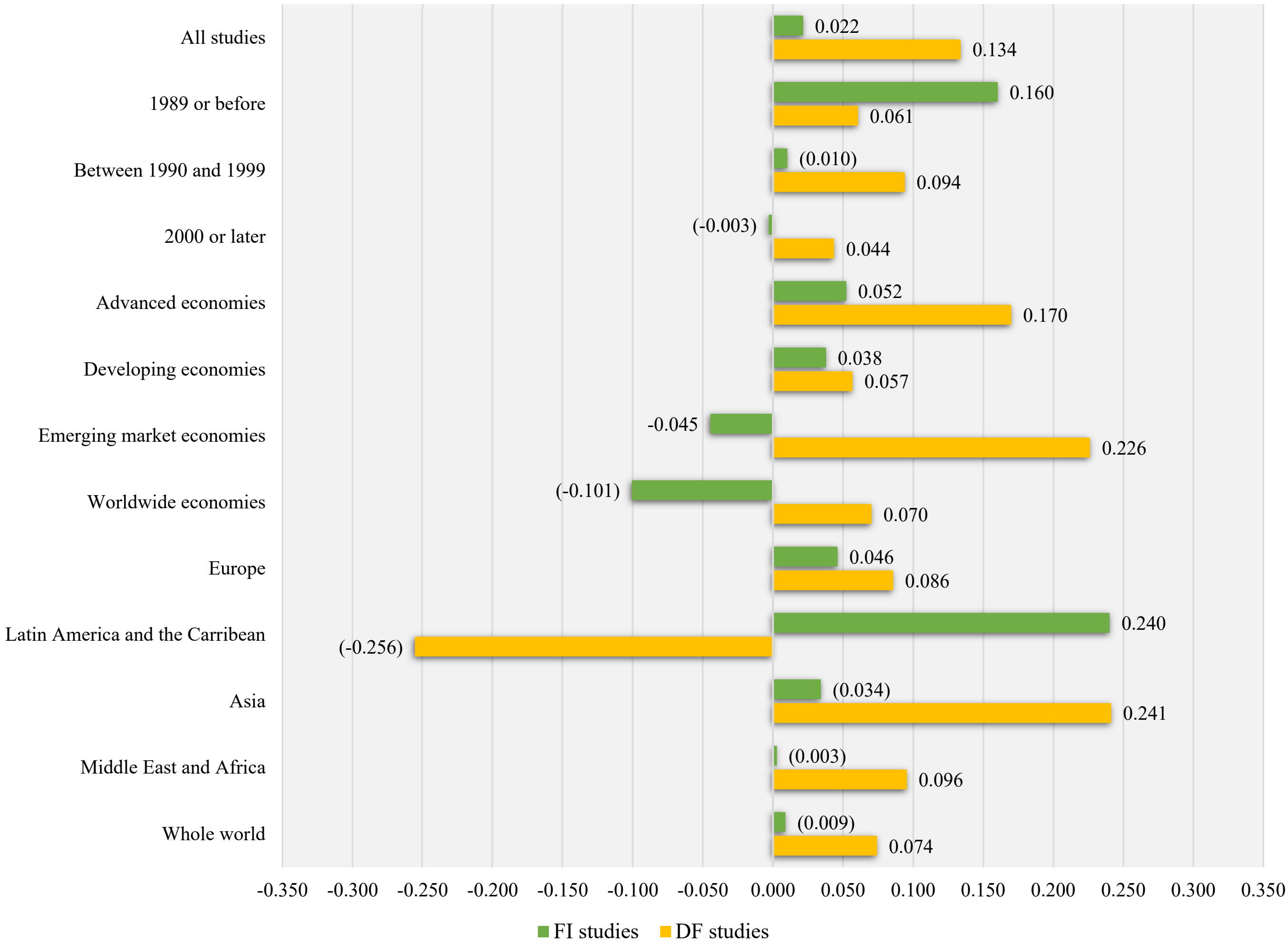

Figure 2. Illustrated comparison of synthesis results

Notes: This figure illustrates the selected synthesized values reported in Table 3. Synthesized values in parentheses are not statistically significantly different from zero.

Table 4. Names, definitions, and descriptive statistics of meta-independent variables

Variable name	Definition	Descriptive statistics		
		Mean	Median	S.D.
DF study	1 = if the financial variable is market capitalization, 0 = otherwise	0.458	0	0.498
Between 1990 and 1999	1 = if the average estimation year is between 1990 and 1990, 0 = otherwise	0.350	0	0.477
2000 or later	1 = if the average estimation year is 2000 or later, 0 = otherwise	0.459	0	0.498
Advanced economies	1 = if the target economy is limited to advanced economies, 0 = otherwise	0.304	0	0.460
Developing economies	1 = if the target economy is limited to developing economies, 0 = otherwise	0.376	0	0.485
Emerging market economies	1 = if the target economy is limited to emerging market economies, 0 = otherwise	0.071	0	0.258
Europe	1 = if the target region is limited to Europe, 0 = otherwise	0.229	0	0.420
Latin America and the Carribean	1 = if the target region is limited to Latin America and the Carribean, 0 = otherwise	0.019	0	0.136
Asia	1 = if the target region is limited to Asia, 0 = otherwise	0.073	0	0.260
Middle East and Africa	1 = if the target region is limited to the Middle East and Africa, 0 = otherwise	0.185	0	0.389
Number of target countries	Total number of target countries	25.309	21	23.887
Panel data	1 = if panel data is employed for empirical analysis, 0 = otherwise	0.844	1	0.363
Time-series data	1 = if time-series data is employed for empirical analysis, 0 = otherwise	0.072	0	0.259
OLS	1 = if OLS estimator is used for estimation, 0 = otherwise	0.242	0	0.429
Real GDP	1 = if the unit of the growth variable is real GDP, 0 = otherwise	0.148	0	0.355
Nominal GDP	1 = if the unit of the growth variable is nominal GDP, 0 = otherwise	0.015	0	0.121
Percent change	1 = if the growth variable is percent change, 0 = otherwise	0.689	1	0.463
With a squared term	1 = if the financial variable is estimated with its squared term, 0 = otherwise	0.305	0	0.460
Lagged	1 = if the financial variable is lagged, 0 = otherwise	0.116	0	0.321
Country fixed effects	1 = if the estimation simultaneously controls for country fixed effects, 0 = otherwise	0.198	0	0.399
Time fixed effects	1 = if the estimation simultaneously controls for time fixed effects, 0 = otherwise	0.309	0	0.462
Macroeconomic stability	1 = if the estimation simultaneously controls for macroeconomic stability, 0 = otherwise	0.534	1	0.499
Trade openness	1 = if the estimation simultaneously controls for trade openness, 0 = otherwise	0.539	1	0.499
Initial condition	1 = if the estimation simultaneously controls for the initial condition, 0 = otherwise	0.267	0	0.443
Human capital	1 = if the estimation simultaneously controls for human capital, 0 = otherwise	0.092	0	0.289
Investment	1 = if the estimation simultaneously controls for investment including capital formation, 0 = otherwise	0.386	0	0.487
Education	1 = if the estimation simultaneously controls for education level, 0 = otherwise	0.470	0	0.499
Institutional quality	1 = if the estimation simultaneously controls for institutional quality, 0 = otherwise	0.148	0	0.355
Financial crisis	1 = if the estimation simultaneously controls for financial crisis, 0 = otherwise	0.073	0	0.261
Treatment of endogeneity	1 = if endogeneity between the growth variable and the financial variable is treated in the estimation, 0 = otherwise	0.056	0	0.229
SE	Standard error of the partial correlation coefficient	0.082	0.071	0.050

Table 5. Meta-regression analysis of model uncertainty for the selection of moderators

Estimator	Bayesian model averaging (BMA)				Weighted-average least squares (WALS)		
Meta-independent variables/Model	[1]				[2]		
	Coef.	*SE*	*t*	PIP	Coef.	*SE*	*t*
Focus regressors							
DF study	0.0728	0.0097	7.50	1.00	0.0694	0.0098	7.08
Between 1990 and 1999	-0.0533	0.0150	-3.55	1.00	-0.0459	0.0157	-2.92
2000 or later	-0.0449	0.0164	-2.74	1.00	-0.0427	0.0163	-2.62
Advanced economies	0.0488	0.0163	2.99	1.00	0.0494	0.0187	2.64
Developing economies	0.0335	0.0183	1.83	1.00	0.0254	0.0178	1.43
Emerging market economies	0.0506	0.0242	2.09	1.00	0.0359	0.0253	1.42
Europe	0.0106	0.0147	0.72	1.00	0.0151	0.0158	0.96
Latin America and the Carribean	0.0836	0.0367	2.28	1.00	0.0868	0.0377	2.30
Asia	0.0823	0.0222	3.70	1.00	0.0824	0.0241	3.42
Middle East and Africa	-0.0410	0.0187	-2.20	1.00	-0.0314	0.0192	-1.63
SE	0.1182	0.1582	0.75	1.00	0.1202	0.1412	0.85
Auxiliary regressors							
Number of target countries	0.0000	0.0000	0.01	0.02	0.0001	0.0003	0.24
Panel data	-0.0410	0.0288	-1.42	0.74	-0.0268	0.0213	-1.26
Time-series data	0.0020	0.0111	0.18	0.06	0.0277	0.0291	0.95
OLS	0.0001	0.0021	0.05	0.03	0.0021	0.0119	0.18
Real GDP	0.0709	0.0155	4.59	1.00	0.0524	0.0143	3.66
Nominal GDP	0.0016	0.0116	0.14	0.04	0.0410	0.0384	1.07
Percent change	0.0001	0.0020	0.03	0.02	0.0053	0.0120	0.44
With a squared term	0.0698	0.0125	5.60	1.00	0.0518	0.0123	4.19
Lagged	-0.0027	0.0095	-0.28	0.10	-0.0274	0.0155	-1.76
Country fixed effects	0.0020	0.0076	0.27	0.09	0.0220	0.0124	1.77
Time fixed effects	-0.0010	0.0053	-0.20	0.06	-0.0213	0.0122	-1.74
Macroeconomic stability	-0.0003	0.0027	-0.10	0.03	-0.0136	0.0104	-1.31
Trade openness	-0.0467	0.0103	-4.52	1.00	-0.0385	0.0110	-3.49
Initial condition	0.0435	0.0168	2.59	0.94	0.0270	0.0127	2.12
Human capital	0.0096	0.0193	0.50	0.24	0.0339	0.0169	2.01
Investment	-0.0002	0.0022	-0.09	0.03	-0.0105	0.0106	-0.99
Education	0.0020	0.0072	0.28	0.10	0.0274	0.0109	2.52
Institutional quality	-0.0002	0.0027	-0.07	0.03	-0.0061	0.0141	-0.43
Financial crisis	-0.0002	0.0034	-0.06	0.03	-0.0105	0.0174	-0.60
Treatment of endogeneity	-0.0006	0.0054	-0.12	0.03	-0.0136	0.0205	-0.66
K	1693				1693		

Notes: See Table 4 for definitions and descriptive statistics of the meta-independent variables. Estimate of the intercept is omitted. *SE* and PIP denote standard errors and posterior inclusion probability, respectively. In theory, the PIP of focus regressors is always 1.00 in Model [1].

Table 6. Meta-regression analysis with selected moderators

Estimator (Analytical weight in brackets[a])	Cluster-robust WLS [Precision]	Cluster-robust WLS [Sample size]	Cluster-robust WLS [Study size]	Multilevel mixed-effects RML	Cluster-robust random-effects panel GLS
Meta-independent variable (Default)/Model	[1]	[2]	[3]	[4]	[5][b]
Study type (FI study)					
DF study	0.0715 ***	0.0684 **	0.0975 ***	0.0657 **	0.0651 **
	(0.025)	(0.030)	(0.030)	(0.027)	(0.028)
Average estimation year (1989 or before)					
Between 1990 and 1999	-0.0550	-0.0562	-0.0187	-0.0073	-0.0057
	(0.047)	(0.064)	(0.046)	(0.038)	(0.040)
2000 or later	-0.0531	-0.0720	-0.0481	-0.0338	-0.0346
	(0.046)	(0.062)	(0.048)	(0.044)	(0.047)
Target economy (Worldwide economies)					
Advanced economies	0.0448	0.0378	0.0568	0.0719 *	0.0728 *
	(0.030)	(0.037)	(0.042)	(0.039)	(0.041)
Developing economies	0.0160	0.0034	0.0716 *	0.0257	0.0245
	(0.044)	(0.052)	(0.041)	(0.039)	(0.041)
Emerging market economies	0.0261	0.0033	0.0562	0.0549	0.0545
	(0.051)	(0.056)	(0.060)	(0.060)	(0.062)
Target region (Whole world)					
Europe	0.0075	0.0126	0.0731	0.0193	0.0193
	(0.023)	(0.029)	(0.055)	(0.015)	(0.015)
Latin America and the Carribean	0.1322 *	0.1532 *	0.0273	0.0636	0.0659
	(0.076)	(0.088)	(0.133)	(0.097)	(0.101)
Asia	0.0853 *	0.0903 *	0.1004 *	0.1102 *	0.1172 *
	(0.050)	(0.053)	(0.055)	(0.057)	(0.062)
Middle East and Africa	-0.0237	-0.0124	-0.0124	0.0115	0.0163
	(0.040)	(0.045)	(0.045)	(0.047)	(0.050)
Selected moderators					
Panel data	0.0023	0.0576	-0.0809	-0.1201 **	-0.1251 **
	(0.042)	(0.036)	(0.069)	(0.053)	(0.054)
Real GDP	0.0616 **	0.0438 *	0.0674	0.0206	0.0165
	(0.026)	(0.025)	(0.045)	(0.023)	(0.021)
With a squared term	0.0543 **	0.0358	0.0791 **	0.0491 *	0.0461
	(0.026)	(0.029)	(0.038)	(0.029)	(0.029)
Trade openness	-0.0455 **	-0.0331	0.0001	-0.0149	-0.0144
	(0.023)	(0.030)	(0.028)	(0.011)	(0.011)
Initial condition	0.0198	-0.0175	0.0196	0.0250	0.0280
	(0.035)	(0.050)	(0.032)	(0.024)	(0.024)
SE	0.50830	0.66090	-0.27805	-0.38718	-0.40571
	(0.3732)	(0.5052)	(0.4301)	(0.4296)	(0.4511)
Intercept	-0.00789	-0.04383	0.05902	0.13493	0.14050 *
	(0.0632)	(0.0767)	(0.0902)	(0.0822)	(0.0851)
K	1693	1693	1693	1693	1693
R^2	0.130	0.129	0.115	-	0.087

Notes: Figures in parentheses beneath the regression coefficients are robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. See Table 4for definitions and descriptive statistics of the meta-independent variables. Selected moderators denote meta-independent variables with a PIP of 0.50 or more in the Bayesian model averaging (BMA) estimation and with a value of 1.00 or more in the weighted-average least squares (WALS) estimation as reported in Table 5.

[a] Precision: inverse of the standard error; Sample size: degree of freedom; Study size: inverse of the number of reported estimates

[b] Hausman test: $\chi^2 = 8.90$, $p = 0.9175$

Table 7. Estimates of the variable of DF study by study type

Study type	Estimator[a]						K
	Cluster-robust WLS [Precision]	Cluster-robust WLS [Sample size]	Cluster-robust WLS [Study size]	Multilevel mixed-effects RML	Cluster-robust fixed-effects panel LSDV[b]	Cluster-robust random-effects panel GLS[b]	
1989 or before	-0.0550 (0.064)	-0.0925 (0.084)	0.0156 (0.048)	0.1144 ** (0.051)	0.1703 ** (0.072)	-	324
Between 1990 and 1999	0.0838 *** (0.031)	0.0925 ** (0.036)	0.0451 (0.041)	0.0842 *** (0.033)	0.0871 ** (0.037)	-	592
2000 or later	0.0911 *** (0.026)	0.0824 *** (0.022)	0.1420 *** (0.040)	0.0403 (0.031)	-	0.0376 (0.031)	777
Advanced economies	0.0590 (0.040)	0.0700 * (0.038)	0.1238 ** (0.057)	0.0334 (0.036)	0.0310 (0.351)	-	515
Developing economies	-0.0351 (0.039)	-0.0664 (0.041)	0.0261 (0.052)	0.0746 * (0.045)	0.0999 * (0.057)	-	637
Emerging market economies	0.0949 ** (0.038)	0.0978 *** (0.028)	0.0388 (0.093)	0.0859 (0.057)	-0.0252 (0.084)	-	121
Worldwide economies	0.1316 *** (0.030)	0.1123 *** (0.033)	0.1466 *** (0.046)	0.1163 *** (0.025)	0.1129 *** (0.027)	-	420
Europe	0.0368 (0.027)	0.0359 (0.031)	0.0110 (0.051)	0.0352 (0.033)	-	0.0350 (0.034)	388
Latin America and the Carribean	-0.3348 (0.189)	-0.2116 ** (0.085)	-0.6741 ** (0.245)	-0.3018 (0.260)	0.1754 *** (0.009)	-	32
Asia	0.2223 *** (0.078)	0.2390 *** (0.067)	0.1066 (0.085)	0.0935 (0.071)	-	0.0852 (0.079)	123
Middle East and Africa	0.0440 (0.047)	0.0105 (0.040)	0.1268 * (0.071)	0.1103 (0.071)	-	0.1219 (0.083)	314
Whole world	0.0794 ** (0.030)	0.0821 ** (0.035)	0.0980 *** (0.037)	0.0681 *** (0.023)	-	0.0677 *** (0.023)	836

Notes: Figures in parentheses beneath the regression coefficients are robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The variable of DF study was estimated with a standard error of partial correlation coefficient and selected moderators that were estimated with a PIP of 0.50 or more in the Bayesian model averaging (BMA) estimation and with a t value of 1.00 or more in the weighted-average least squares (WALS) estimation.

[a] Precision: inverse of the standard error; Sample size: degree of freedom; Study size: inverse of the number of reported estimates

[b] Reported estimates are obtained from selected model by Hausman test of model specification of cluster-robust fixed-effects and random-effects panel models. Otherwise dash "-" is described.

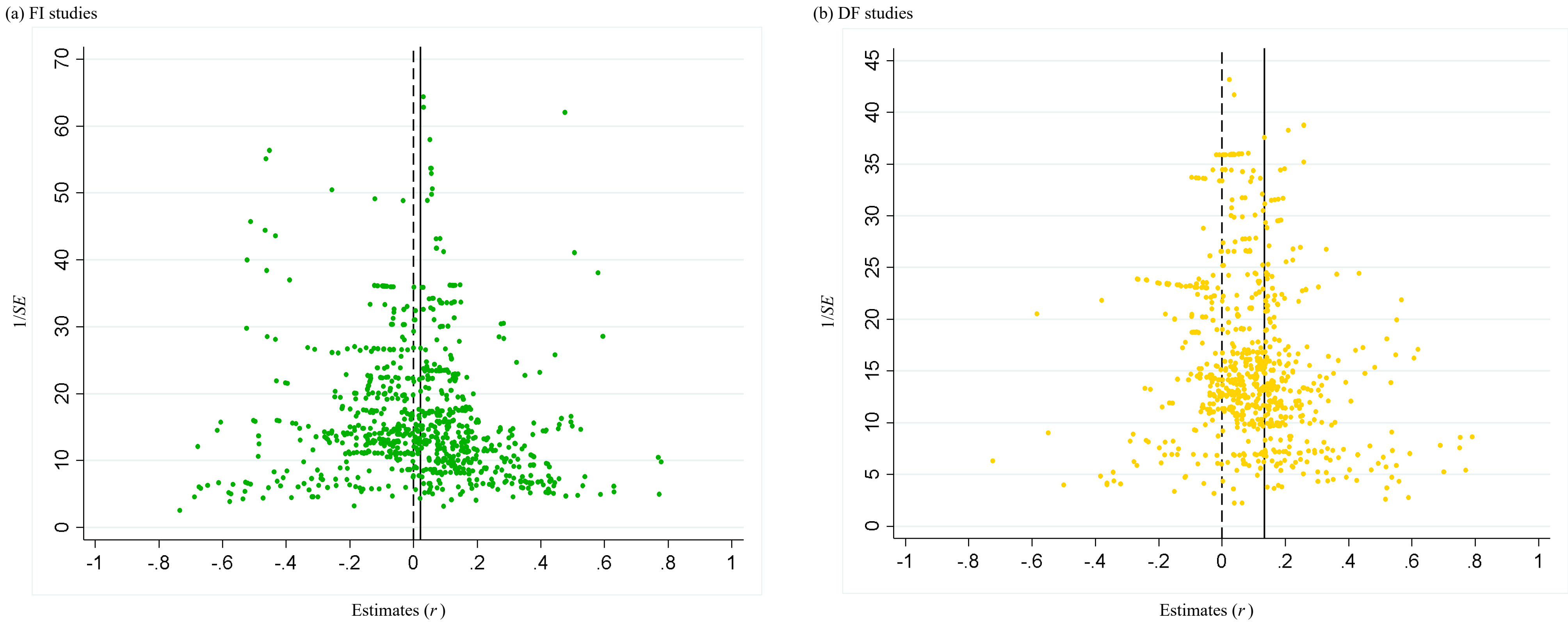

Figure 3. Funnel plot of partial correlation coefficients

Note: Solid lines indicate the selected synthesized effect sizes reported in Table 3.

Table 8. Meta-regression analysis of publication selection: FI studies

(a) FAT-PET test (Equation: $t = \gamma_0 + \gamma_1(1/SE) + v$)

Estimator	Unrestricted WLS	WLS with bootstrapped standard errors	Cluster-robust WLS	Cluster-robust random-effects panel GLS	IV
Model	[1]	[2]	[3]	[4] [a]	[5]
Intercept (FAT: H_0: $\gamma_0 = 0$)	1.1027 **	1.1027 ***	1.1027	0.8513	0.9103 ***
	(0.440)	(0.407)	(0.844)	(0.626)	(0.302)
$1/SE$ (PET: H_0: $\gamma_1 = 0$)	-0.0586 *	-0.0586 **	-0.0586	-0.0216	-0.0471 ***
	(0.031)	(0.027)	(0.060)	(0.051)	(0.016)
K	918	918	918	918	918
R^2	0.0221	0.0221	0.0221	0.0221	0.0212

(b) PEESE approach (Equation: $t = \varphi_0 SE + \varphi_1(1/SE) + w$)

Estimator	Unrestricted WLS	WLS with bootstrapped standard errors	Cluster-robust WLS	Random-effects panel ML	IV
Model	[6]	[7]	[8]	[9]	[10]
SE	5.7384 ***	5.7384 ***	5.7384	4.2759 *	-2.9426
	(1.884)	(1.669)	(3.788)	(2.593)	(4.613)
$1/SE$ (H_0: $\varphi_1 = 0$)	-0.0249	-0.0249	-0.0249	-0.0010	0.0506
	(0.017)	(0.016)	(0.035)	(0.013)	(0.038)
K	918	918	918	918	918
R^2	0.0155	0.0155	0.0155	-	-

Notes: Figures in parentheses beneath the regression coefficients are standard errors. Models [3], [4], and [8] report standard errors clustered by study. Models [5] and [10] use the inverse of the square root of the number of observations used as an instrument of the standard error. *** and ** denote statistical significance at the 1% and 5% levels, respectively.

[a] Hausman test: χ^2=0.11, p = 0.7396

Table 9. Meta-regression analysis of publication selection: DF studies

(a) FAT-PET test (Equation: $t = \gamma_0 + \gamma_1(1/SE) + v$)

Estimator	Unrestricted WLS	WLS with bootstrapped standard errors	Cluster-robust WLS	Cluster-robust random-effects panel GLS	IV
Model	[1]	[2]	[3]	[4] [a]	[5]
Intercept (FAT: H_0: $\gamma_0 = 0$)	0.8375 ***	0.8375 ***	0.8375 **	1.0066 ***	0.9816 ***
	(0.170)	(0.149)	(0.365)	(0.302)	(0.229)
$1/SE$ (PET: H_0: $\gamma_1 = 0$)	0.0307 **	0.0307 ***	0.0307	0.0298 **	0.0215 *
	(0.012)	(0.011)	(0.034)	(0.015)	(0.013)
K	775	775	775	775	775
R^2	0.0104	0.0104	0.0104	0.0104	0.0095

(b) PEESE approach (Equation: $t = \varphi_0 SE + \varphi_1(1/SE) + w$)

Estimator	Unrestricted WLS	WLS with bootstrapped standard errors	Cluster-robust WLS	Random-effects panel ML	IV
Model	[6]	[7]	[8]	[9]	[10]
SE	3.9187 ***	3.9187 ***	3.9187 **	3.5260 **	-8.8281 ***
	(0.811)	(0.924)	(1.681)	(1.511)	(2.842)
$1/SE$ (H_0: $\varphi_1 = 0$)	0.0604 ***	0.0604 ***	0.0604 ***	0.0619 ***	0.1861 ***
	(0.007)	(0.007)	(0.023)	(0.010)	(0.026)
K	775	775	775	775	775
R^2	0.2381	0.2381	0.2381	-	-

Notes: Figures in parentheses beneath the regression coefficients are standard errors. Models [3], [4], and [8] report standard errors clustered by study. Models [5] and [10] use the inverse of the square root of the number of observations used as an instrument of the standard error. *** and ** denote statistical significance at the 1% and 5% levels, respectively.

[a] Hausman test: χ^2=0.83, p = 0.3616

Table 10. Alternative estimates of publication selection bias–corrected effect size

(a) FI studies

Method	Top 10[a]	Selection model[b]	Endogeneous kink model[c]	*p* -uniform[d]
Model	[1]	[2]	[3]	[4]
Publication selection bias–corrected effect size	-0.0223	-0.0060	-0.0586 ***	-0.0068 ***
	(0.020)	(0.019)	(0.013)	(0.002)
K	91	918	918	918

(b) DF studies

Method	Top 10[a]	Selection model[b]	Endogeneous kink model[c]	*p* -uniform[d]
Model	[5]	[6]	[7]	[8]
Publication selection bias–corrected effect size	0.0766 ***	0.0520 ***	0.0306 ***	0.0694 ***
	(0.010)	(0.002)	(0.011)	(0.002)
K	77	775	775	775

Notes: Figures in parentheses are standard errors. *** denotes that the coefficient is statistically significantly different from zero at the 1% level.

[a] Arithmetic average of the top 10% most precise estimates (Stanley et al., 2010)

[b] Test for publication selection bias using the conditional probability of publication as a function of a study's results (Andrews and Kasy, 2019)

[c] Piecewise linear meta-regression of estimates on their standard errors, with a kink at the cutoff value of the standard error below which publication selection bias is unlikely (Bom and Rachinger, 2019)

[d] Method based on the statistical theory that the distribution of *p* -values is uniform conditional on the population effect size (van Aert and van Assen, 2021)

Table 11. Summary of publication selection bias test

Study type	FI studies				DF studies			
	Number of estimates (K)	Test results[a]			Number of estimates (K)	Test results[a]		
		Funnel-asymmetry test (FAT) (H$_0$: $\gamma_0 = 0$)	Precision-effect test (PET) (H$_0$: $\gamma_1 = 0$)	Precision-effect estimate with standard error (PEESE) (H$_0$: $\varphi_1 = 0$)[b]		Funnel-asymmetry test (FAT) (H$_0$: $\gamma_0 = 0$)	Precision-effect test (PET) (H$_0$: $\gamma_1 = 0$)	Precision-effect estimate with standard error (PEESE) (H$_0$: $\varphi_1 = 0$)[b]
All studies	918	**Rejected**	**Rejected**	Not rejected	775	**Rejected**	**Rejected**	**Rejected (0.0604/0.1861)**
1989 or before	188	Not rejected	**Rejected**	**Rejected (0.1319/0.2800)**	136	**Rejected**	Not rejected	Not rejected
Between 1990 and 1999	333	**Rejected**	**Rejected**	Not rejected	259	**Rejected**	**Rejected**	**Rejected (0.0592/0.1474)**
2000 or later	397	**Rejected**	**Rejected**	**Rejected (-0.0879/-0.0682)**	380	**Rejected**	**Rejected**	**Rejected (0.0668/0.3168)**
Advanced economies	247	**Rejected**	Not rejected	Not rejected	268	Not rejected	**Rejected**	**Rejected (0.0950/0.3547)**
Developing economies	387	Not rejected	Not rejected	Not rejected	250	**Rejected**	**Rejected**	**Rejected (0.0390/0.1881)**
Emerging market economies	61	**Rejected**	**Rejected**	**Rejected (-0.1171/-0.0832)**	60	Not rejected	**Rejected**	**Rejected (0.1673/0.3150)**
Worldwide economies	223	Not rejected	**Rejected**	Not rejected	197	Not rejected	**Rejected**	**Rejected (0.0693/0.1346)**
Europe	175	Not rejected	Not rejected	Not rejected	213	**Rejected**	Not rejected	**Rejected (0.0656/0.1412)**
Latin America and the Carribean	29	Not rejected	**Rejected**	**Rejected (0.2551/0.2649)**	3	Not rejected	Not rejected	Not rejected
Asia	67	**Rejected**	Not rejected	Not rejected	56	Not rejected	**Rejected**	**Rejected (0.2214/0.5727)**
Middle East and Africa	189	Not rejected	Not rejected	Not rejected	125	**Rejected**	**Rejected**	Not rejected
Whole world	458	**Rejected**	**Rejected**	Not rejected	378	**Rejected**	Not rejected	**Rejected (0.0541/0.1159)**

Notes:

[a] The null hypothesis is rejected when three or more models show a statistically significant estimate; otherwise not rejected.

[b] Figures in parentheses are PSB-adjusted estimates. If two estimates are reported, the left- and right-hand figures denote the minimum and maximum estimates, respectively.

Table 12. Summary of hypothesis testing

Study type	Meta-synthesis	Meta-regression analysis	Test for publication selection bias and the presence of genuine empirical evidence
All studies	○	○	(○)
1989 or before	×	—	(×)
Between 1990 and 1999	○	○	(○)
2000 or later	○	○	○
Advanced economies	○	—	(○)
Developing economies	○	—	(○)
Emerging market economies	○	—	○
Worldwide economies	○	○	(○)
Europe	○	—	(○)
Latin America and the Carribean	×	—	(×)
Asia	○	—	(○)
Middle East and Africa	○	—	(—)
Whole world	○	○	(○)

Note: Symbols in the table denote the following. ○: The hypothesis that the growth-enhancing effect of direct financing outperforms that of financial intermediation is supported; ×: The hypothesis is rejected because the test result indicates that the effect size of financial intermediation exceeds that of direct financing; —: The hypothesis is not supported because the test result indicates that there is no difference in the effect size between financial intermediation and direct financing; (○): The hypothesis is supposed to be supported, but final judgment cannot be made because of the lack of genuine empirical evidence on financial intermideation; (×): The hypothesis is supposed to be rejected, but final judgment cannot be made because of the lack of genuine empirical evidence on direct financing; (-) Hypothesis testing is failed because of the lack of genuine empirical evidence both on financial intermediation and direct financing.

Appendix Table A1. Meta-regression analysis with all moderators

Estimator (Analytical weight in brackets)[a]	Cluster-robust WLS [Precision]	Cluster-robust WLS [Sample size]	Cluster-robust WLS [Study size]	Multilevel mixed-effects RML	Cluster-robust random-effects panel GLS
Meta-independent variable (Default)/Model	[1]	[2]	[3]	[4]	[5][b]
Study type (FI study)					
DF study	0.0639 ***	0.0527 **	0.0922 ***	0.0648 **	0.0641 **
	(0.022)	(0.023)	(0.029)	(0.027)	(0.028)
Average estimation year (1989 or before)					
Between 1990 and 1999	-0.0451	-0.0227	-0.0200	0.0012	0.0040
	(0.046)	(0.056)	(0.046)	(0.038)	(0.040)
2000 or later	-0.0448	-0.0378	-0.0747	-0.0440	-0.0439
	(0.044)	(0.050)	(0.047)	(0.044)	(0.048)
Target economies (Worldwide economies)					
Advanced economies	0.0212	-0.0134	0.1023 *	0.0684	0.0673
	(0.044)	(0.047)	(0.052)	(0.042)	(0.043)
Developing economies	-0.0044	-0.0300	0.0948 **	0.0256	0.0230
	(0.045)	(0.050)	(0.043)	(0.039)	(0.040)
Emerging market economies	-0.0193	-0.0603	0.0668	0.0500	0.0483
	(0.051)	(0.055)	(0.062)	(0.055)	(0.057)
Target region (Whole world)					
Europe	0.0039	-0.0015	0.1149 **	0.0176	0.0168
	(0.029)	(0.037)	(0.058)	(0.018)	(0.018)
Latin America and the Carribean	0.1175	0.1247	0.0659	0.0662	0.0657
	(0.075)	(0.077)	(0.130)	(0.098)	(0.104)
Asia	0.0299	-0.0296	0.1533 **	0.1086	0.1134
	(0.050)	(0.053)	(0.066)	(0.068)	(0.075)
Middle East and Africa	-0.0411	-0.0476	0.0151	0.0077	0.0110
	(0.040)	(0.043)	(0.048)	(0.051)	(0.057)
Number of target countries					
Number of target countries	-0.0006	-0.0013 **	0.0007	-0.0005	-0.0005
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Data type (Cross-sectional data)					
Panel data	0.0552	0.1345 ***	-0.0722	-0.1204 **	-0.1248 **
	(0.056)	(0.052)	(0.076)	(0.058)	(0.060)
Time-series data	0.0999	0.1750 **	-0.0364	-0.0189	-0.0149
	(0.080)	(0.083)	(0.085)	(0.072)	(0.073)
Estimator (Estimators other than OLS)					
OLS	0.0339	0.0629 *	-0.0161	0.0112	0.0125
	(0.026)	(0.033)	(0.033)	(0.014)	(0.015)
Characteristics of growth variable (GDP per capita)					
Real GDP	0.0551 **	0.0340	0.0684	0.0222	0.0178
	(0.028)	(0.028)	(0.044)	(0.023)	(0.021)
Nominal GDP	0.0224	-0.0661	0.1869	0.1442	0.1500
	(0.085)	(0.064)	(0.134)	(0.105)	(0.107)
Other characteristics of financial variable					
Percent change (log-transformed)	-0.0004	0.0021	0.0542 *	0.0440	0.0453
	(0.023)	(0.028)	(0.032)	(0.029)	(0.031)
With a squared term	0.0473	0.0095	0.0730 *	0.0442	0.0406
	(0.029)	(0.034)	(0.038)	(0.028)	(0.029)
Lagged	-0.0090	-0.0162	-0.0584	-0.0026	0.0040
	(0.028)	(0.032)	(0.043)	(0.029)	(0.031)
Selection of control variables					
Country fixed effects	0.0477 *	0.0592 **	0.0192	0.0050	0.0031
	(0.025)	(0.028)	(0.032)	(0.023)	(0.024)
Time fixed effects	-0.0122	-0.0070	-0.0822 ***	-0.0159	-0.0117
	(0.026)	(0.030)	(0.028)	(0.017)	(0.016)
Macroeconomic stability	-0.0272	-0.0394	-0.0083	-0.0309 *	-0.0339 **
	(0.024)	(0.033)	(0.034)	(0.018)	(0.017)
Trade openness	-0.0394	-0.0257	-0.0249	-0.0256	-0.0248
	(0.026)	(0.036)	(0.030)	(0.019)	(0.018)
Initial condition	0.0154	-0.0158	-0.0056	0.0115	0.0149
	(0.032)	(0.038)	(0.033)	(0.026)	(0.026)
Human capital	0.0678	0.0886 *	0.0776 *	0.0767 **	0.0815 **
	(0.043)	(0.047)	(0.043)	(0.036)	(0.038)
Investment	-0.0099	-0.0037	-0.0389	-0.0154	-0.0163
	(0.028)	(0.031)	(0.030)	(0.023)	(0.024)
Education	0.0308	0.0390	0.0611 **	0.0537 **	0.0570 ***
	(0.028)	(0.034)	(0.028)	(0.021)	(0.022)
Institutional quality	0.0086	0.0122	0.0230	0.0425	0.0481
	(0.034)	(0.035)	(0.036)	(0.035)	(0.037)
Financial crisis	-0.0392	-0.0773	-0.0411	0.0042	0.0052
	(0.054)	(0.065)	(0.060)	(0.041)	(0.042)
Treatment of endogeneity (No treatment)					
Treatment of endogeneity	-0.0241	-0.0155	-0.0159	-0.0080	-0.0061
	(0.048)	(0.050)	(0.056)	(0.023)	(0.021)
SE	0.4682	0.6190	-0.2067	-0.4576	-0.4829
	(0.442)	(0.581)	(0.443)	(0.454)	(0.480)
Intercept	-0.0295	-0.0701	0.0039	0.1237	0.1283
	(0.104)	(0.122)	(0.122)	(0.099)	(0.104)
K	1693	1693	1693	1693	1693
R^2	0.162	0.216	0.162	-	0.082

Notes: Figures in parentheses beneath the regression coefficients are robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. See Table 4 for definitions and descriptive statistics of the meta-independent variables.

[a] Precision: inverse of the standard error; Sample size: degree of freedom; Study size: inverse of the number of reported estimates

[b] Hausman test: $\chi^2 = 23.46, p = 0.7961$

Supplement
List of Literature Subject to Meta-analysis

1. Akinboade, Oludele A. (2000) The relationship between financial deepening and economic growth in Tanzania, Journal of International Development, 12:7, pp. 939-950.
2. Allen, Donald S. and Léonce Ndikumana (2000) Financial intermediation and economic growth in Southern Africa, Journal of African Economies, 9:2, pp. 132-160.
3. Beck, Thorsten, Ross Levine and Norman Loayza (2000) Finance and the sources of growth, Journal of Financial Economics, 58:1-2, pp. 261-300.
4. Rousseau, P.L. and P. Wachtel (2000) Equity markets and growth: Cross-country evidence on timing and outcomes, 1980-1995, Journal of Banking & Finance, 24:11, pp. 1933-1957.
5. Bekaert, Geert, Campbell R. Harvey and Christian Lundblad (2001) Emerging equity markets and economic development, Journal of Development Economics, 66:2, pp. 465–504.
6. Reisen, Helmut and Marcelo Soto (2001) Which types of capital inflows foster developing-country growth? International Finance, 4:1, pp. 1–14.
7. Edison, Hali J., Ross Levine, Luca Ricci and Torsten Sløk (2002) International financial integration and economic growth, Journal of International Money and Finance, 21:6, pp. 749–776.
8. Jaliliani, Hossein and Colin Kirkpatrick (2002) Financial development and poverty reduction in developing countries, International Journal of Finance and Economics, 7: 2, pp. 97–108.
9. Driffill, John (2003) Growth and finance, Manchester School, 71:4, pp. 363–380.
10. Manning, Mark J. (2003) Finance causes growth: Can we be so sure? Contributions to Macroeconomics, 3:1, Article 12.
11. Minier, Jenny A. (2003) Are small stock markets different? Journal of Monetary Economics, 50:7, pp. 1593–1602.
12. Omran, Mohammed and Ali Bolbol (2003) Foreign direct investment, financial development, and economic growth: evidence from the Arab countries, Review of Middle East Economics and Finance, 1:3, pp. 231–249.
13. Andres, Javier, Ignacio Hernando and J. David López-Salido (2004) The role of the financial system in the growth–inflation link: the OECD experience, European Journal of Political Economy, 20:4, pp. 941–961.
14. Beck, Thorsten and Ross Levine (2004) Stock markets, banks, and growth: Panel evidence, Journal of Banking & Finance, 28:3, pp. 423–442.
15. Berger, Allen N., Iftekhar Hassan and Leora F. Klapper (2004) Further evidence on the link between finance and growth: An international analysis of community banking and economic performance, Journal of Financial Services Research, 25:2-3, pp. 169-202.
16. Garretsen, Harry, Robert Lensink and Elmer Sterken (2004) Growth, financial development, societal norms and legal institutions, Journal of International Financial Markets, Institutions & Money, 14:2, pp. 165-183.
17. Bekaert, Geert, Campbell R. Harvey and Christian Lundblad (2005) Does financial liberalization spur growth? Journal of Financial Economics, 77:1, pp. 3-55.
18. Bolbol, Ali A., Ayten Fatheldin and Mohammed M. Omran (2005) Financial development, structure, and economic growth: the case of Egypt, 1974–2002, Research in International Business and Finance, 19:1, pp. 171–194.

19. Fink, Gerhard, Peter Haiss and Hans Christian Mantler (2005a) The finance-growth nexus: Market economies vs. transition countries, EI Working Paper No. 64, Europainstitut: Vienna.
20. Fink, Gerhard, Peter Haiss, Goran Vukšić (2005b) Importance of financial sectors for growth in accession countries, paper presented at the European Finance Association Annual Meeting: Moscow.
21. Al-Zubi, Khaled, Samer Al-Rjoub and E.Abu-Mhareb (2006) Financial development and economic growth: A new empirical evidence from the MENA countries, 1989-2001, Applied Econometrics and International Development, 6:3. pp. 137-150.
22. Bandyopadhyay, Debasis (2006) How financial development caused economic growth in APEC countries: Financial integration with FDI or privatization without FDI, Asia-Pacific Development Journal, 13:1, pp. 75-100.
23. Demetriades, Panicos and Siong Hook Law (2006) Finance, institutions and economic development, International Journal of Finance and Economics, 11:3, pp. 245-260.
24. Dreher, Axel (2006) Does globalization affect growth? Evidence from a new index of globalization, Applied Economics, 38:10, pp. 1091-1110.
25. Fink, Gerhard, Peter Haiss, Goran Vukšić (2006) Importance of financial sectors for growth in accession countries, In: Liebscher, Klaus, Josef Christl, Peter Mooslechner, and Doris Ritzberger-Grunwald (Eds.) Financial Development, Integration and Stability: Evidence from Central, Eastern and South-Eastern Europe. Edward Elgar: Cheltenham and Northampton, MA, pp. 154-185.
26. Habibullah, Muzafar Shah and Yoke-Kee Eng (2006) Does financial development cause economic growth? A panel data dynamic analysis for the Asian developing countries, Journal of the Asia Pacific Economy, 11:4, pp. 377–393.
27. Liu Wan-Chun and Chen-Min Hsu (2006) The role of financial development in economic growth: The experiences of Taiwan, Korea, and Japan, Journal of Asian Economics, 17:4, pp. 667–690.
28. Padoan, Pier Carlo and Fabio Mariani (2006) Growth and finance: European integration and the Lisbon strategy, Journal of Common Market Studies, 44:1, pp. 77-112
29. Shen, Chung-Hua and Chien-Chiang Lee (2006) Same financial development yet different economic growth: Why, Journal of Money, Credit and Banking, 38:7, pp. 1907-1944.
30. Tang, Donny (2006) The effect of financial development on economic growth: evidence from the APEC countries, 1981–2000, Applied Economics, 38:16, pp. 1889–1904.
31. Apergis, Nicholas, Ioannis Filippidis, and Claire Economidou (2007) Financial deepening and economic growth linkages: A panel data analysis, Review of World Economics, 143: 1, pp. 179-198.
32. Hagmayr, Bettina and Peter R. Haiss (2007) Financial sector development and economic growth: Evidence for Southeastern Europe, In: Altzinger, Wilfried and Ivanka Petkova (eds.) Impacts of Foreign Direct Investments on Banking Sectors in South East European Countries, Economic Policy Institute: Sofia, pp. 7-29.
33. Kemal, A.R., Abdul Qayyum and Muhammad N. Hanif (2007) Financial development and economic growth: Evidence from a heterogeneous panel of high income countries, Lahore Journal of Economics, 12: 1, pp. 1-34.
34. Liang, Hsin-Yu and Alan Reichert (2007) Economic growth and financial sector development, International Journal of Business and Finance Research, 1:1, pp. 68-78.

35. Naceur, Samy Ben and Samir Ghazouani (2007) Stock markets, banks, and economic growth: Empirical evidence from the MENA region, Research in International Business and Finance, 21:2, pp. 297–315.
36. Stefani, Patricia (2007) Financial development and economic growth in Brazil: 1986-2006, Economics Bulletin, 3:69, pp. 1-13.
37. Guariglia, Alessandra and Sandra Poncet (2008) Could financial distortions be no impediment to economic growth after all? Evidence from China, Journal of Comparative Economics, 36:4, pp. 633–657.
38. Honig, Adam (2008) Addressing causality in the effect of capital account liberalization on growth, Journal of Macroeconomics, 30:4, pp. 1602-1616.
39. Masten, Arjana Brezigar, Fabrizio Coricelli and Igor Masten (2008) Non-linear growth effects of financial development: Does financial integration matter? Journal of International Money and Finance, 27:2, pp. 295-313.
40. Ventura, Constanza Martínez (2008) The effects of financial intermediation on Colombian economic growth, Ensayos sobre Política Económica, 26:57, pp. 250-280.
41. Cooray, Arusha (2009) The financial sector and economic growth, Economic Record, 85, pp. S10–S21.
42. Fink, Gerhard, Peter Haissa, and Goran Vuksic (2009) Contribution of financial market segments at different stages of development: Transition, cohesion and mature economies compared, Journal of Financial Stability, 5:4, pp. 431–455.
43. Giuliano, Paola, and Marta Ruiz-Arranz (2009) Remittances, financial development, and growth, Journal of Development Economics, 90:1, pp. 144–152.
44. Hasan, Iftekhar, Paul Wachtel,and Mingming Zhou (2009a) Institutional development, financial deepening and economic growth: Evidence from China, Journal of Banking & Finance, 33:1, pp. 157–170.
45. Hasan, Iftekhar, Michael Koetter,and Michael Wedow (2009b) Regional growth and finance in Europe: Is there a quality effect of bank efficiency? Journal of Banking & Finance, 33:8, pp. 1446–1453.
46. Huang, Ho-Chuan and Shu-Chin Lin (2009) Non-linear finance—growth nexus: A threshold with instrumental variable approach, Economics of Transition, 17:3, pp. 439–466.
47. Mundaca, B. Gabriela (2009) Remittances, financial market development, and economic growth: The case of Latin America and the Caribbean, Review of Development Economics, 13:2, pp. 288–303.
48. Saibu, M.O., Bowale, K.E.I. and Akinlo, A.E. (2009) Financial structure and economic growth: empirical evidence from Nigeria, International Journal of Business and Emerging Markets, 1:3, pp. 264-281.
49. Yay, Gülsün and Asuman Oktayer (2009) Financial development and economic growth: A comparative analysis, Romanian Journal of Economic Forecasting, 11:3, pp. 56-74.
50. Ang, James B. (2010) Does foreign aid promote growth? Exploring the role of financial liberalization, Review of Development Economics, 14:2, pp. 197–212.
51. Bangake, Chrysost and Jude C. Eggoh (2010) Finance-growth link in OECD countries: Evidence from panel causality and cointegration tests, Brussels Economic Review, 53:3-4, pp. 375-392.
52. Chang, Shu-Hwa and Liang-Chou Huang (2010) The nexus of finance and GDP growth in

Japan: Do real interest rates matter? Japan and the World Economy, 22:4, pp. 235-242.
53. Choong, Chee-Keong, Ahmad Zubaidi Baharumshah, Zulkornain Yusop and Muzafar Shah Habibullah (2010) Private capital flows, stock market and economic growth in developed and developing countries: A comparative analysis, Japan and the World Economy, 22:2, pp. 107–117.
54. Huang, Ho-Chuan , Shu-Chin Lin, Dong-Hyeon Kim and Chih-Chuan Yeh (2010) Inflation and the finance–growth nexus, Economic Modelling, 27:1, pp. 229–236.
55. Kim, Dong-Hyeon, Ho-Chuan Huang, Shu-Chin Lin and Chih-Chuan Yeh (2010) Financial development on growth convergence, Scottish Journal of Political Economy, 57:4, pp. 493-514.
56. Koetter, Michael and Michael Wedow (2010) Finance and growth in a bank-based economy: Is it quantity or quality that matters? Journal of International Money and Finance, 29:8, pp. 1529–1545.
57. Leitão, Nuno Carlos (2010) Financial development and economic growth: A panel data approach, Theoretical and Applied Economics, 17:10, pp. 15-24.
58. Bangake, Chrysost and Jude C. Eggoh (2011) Further evidence on finance-growth causality: A panel data analysis, Economic Systems, 35:2, pp. 176-188.
59. Cojocaru, Laura, Saul Hoffman and Jeffrey Miller (2011) Financial development and economic growth: Empirical evidence from the CEE and CIS countries, Working Paper No. 2011-22, Department of Economics, Alfred Lerner College of Business and Economics, University of Delaware: Newark.
60. Compton, Ryan A. and Daniel C. Giedeman (2011) Panel evidence on finance, institutions and economic growth, Applied Economics, 43:25, pp. 3523–3547.
61. Hassan, M. Kabir, Benito Sanchez and Jung-Suk Yu (2011a) Financial development and economic growth in the organization of Islamic conference countries, Journal of King Abdulaziz University: Islamic Economics, 24:1, pp. 145-172.
62. Hassan, M. Kabir, Benito Sanchez and Jung-Suk Yu (2011b) Financial development and economic growth: New evidence from panel data, Quarterly Review of Economics and Finance, 51:1, pp. 88-104.
63. Anwar, Sajid and Arusha Cooray (2012) Financial development, political rights, civil liberties and economic growth: Evidence from South Asia, Economic Modelling, 29:3, pp. 974-981.
64. Bettin, Giulia and Alberto Zazzaro (2012) Remittances and financial development: Substitutes or complements in economic growth? Bulletin of Economic Research, 64:4, pp. 509-536.
65. Kim, Dong-Hyeon, Shu-Chin Lin and Yu-Bo Suen (2012) The simultaneous evolution of economic growth, financial development, and trade openness, Journal of International Trade & Economic Development, 21:4, pp. 513–537.
66. Masoud, Najeb and Glenn Hardaker (2012) The impact of financial development on economic growth: Empirical analysis of emerging market countries, Studies in Economics and Finance, 29:3, pp. 148-173.
67. Ogwumike, Fidelis O. and Afees A. Salisu (2012) Financial development and economic growth in Nigeria, Journal of Monetary and Economic Integration, 12:2, pp. 91-119.
68. Abdmoulah, Walid and Riadh Ben Jelili (2013) Access to finance thresholds and the finance-

growth nexus, Economic Papers, 32:4, pp. 522–534.
69. Akisik, Orhan (2013) Accounting regulation, financial development, and economic growth, Emerging Markets Finance & Trade, 49:1, pp. 33-67.
70. Awojobi, Omotola (2013) Does trade openness and financial liberalization foster growth: An empirical study of Greek economy, International Journal of Social Economics, 40:6, pp. 537-555.
71. Falahaty, Manizheh and Law Siong Hook (2013) The effect of financial development on economic growth in the MENA region, Journal of Economic Cooperation and Development, 34:3, pp. 35-60.
72. Kagochi, John M. (2013) Financial development and economic growth in Kenya: Evidence from an expanded neoclassical growth approach, Asian-African Journal of Economics and Econometrics, 13:2, pp. 117-131.
73. Kagochi, John M., Omar M. Al Nasser and Ellene Kebede (2013) Does financial development hold the key to economic growth? The case of Sub-Saharan Africa, The Journal of Developing Areas, 47:2, pp. 61-79.
74. Kouki, Imen (2013) Financial development and economic growth in the North African region, African Development Review, 25:4, pp. 551–562.
75. Maduka, Anne C. and Kevin O. Onwuka (2013) Financial market structure and economic growth: Evidence from Nigeria, Asian Economic and Financial Review, 3:1, pp. 75-98.
76. Narayan, Paresh Kumar and Seema Narayan (2013) The short-run relationship between the financial system and economic growth: New evidence from regional panels, International Review of Financial Analysis, 29, pp. 70–78.
77. Agbloyor, Elikplimi Komla, Joshua Yindenaba Abor, Charles Komla Delali Adjasi,and Alfred Yawson,(2014) Private capital flows and economic growth in Africa: The role of domestic financial markets, Journal of International Financial Markets, Institutions & Money, 30, pp. 137-152.
78. Alenoghena, Raymond Osi (2014) Capital market, financial deepening and Nigeria's economic growth: empirical evidence, Journal of Economic & Financial Studies, 2:4, pp. 43-52.
79. Ayouni, Saif Eddine, Fakhri Issaoui and Salem Brahim (2014) Financial liberalization, foreign direct investment and economic growth: A dynamic panel data validation, International Journal of Economics and Financial Issues, 4:3, pp. 677-697.
80. Bayar, Yilmaz (2014) Financial development and economic growth in emerging Asian countries, Asian Social Science, 10: 9, pp. 8-17.
81. Cheng, Su-Yin, Chia-Cheng Ho and Han Hou (2014) The Finance-growth relationship and the level of country development, Journal of Financial Services Research, 45:1, pp. 117-140.
82. Gaffeo, Edoardo and Petya Garalova (2014) On the finance-growth nexus: additional evidence from Central and Eastern Europe countries, Economic Change & Restructuring, 47:2, pp. 89-115.
83. Gambacorta, Leonardo, Jing Yang and Kostas Tsatsaronis (2014) Financial structure and growth, BIS Quarterly Review, March: 2014, pp. 21-35.
84. Grassa, Rihab and Kaouthar Gazdar (2014) Financial development and economic growth in GCC countries, International Journal of Social Economics, 41:6, pp. 493-514.
85. Mhadhbi, Khalil (2014) Financial development and economic growth: A dynamic panel data

analysis, International Journal of Econometrics and Financial Management, 2:2, pp. 48-58.

86. Ngare, Everlyne, Esman Morekwa Nyamongo and Roseline N. Misati (2014) Stock market development and economic growth in Africa, Journal of Economics and Business, 74, pp. 24–39.
87. Odhiambo, Nicholas M. (2014) Financial systems and economic growth in South Africa: a dynamic complementarity test, International Review of Applied Economics, 28:1, pp. 83-101.
88. Omoruyi, Aigbovo and Uwubamwen Ahmed, Ede (2014) Financial system development and economic growth the Nigerian stock market and bank perspective, Asian Journal of Business Management, 6:4, pp. 155-172.
89. Owen, Ann L. and Judit Temesvary (2014) Heterogeneity in the growth and finance relationship: How does the impact of bank finance vary by country and type of lending? International Review of Economics and Finance, 31, pp. 275-288.
90. Rajabi, Ehsan, and Junaina Muhammad (2014) The stock markets, banks and growth nexus: Asian Islamic countries, Economic Notes, 43:2, pp. 137-165.
91. Sahoo, Satyananda (2014) Financial intermediation and growth: bank-based versus market-based systems, Journal of Applied Economic Research, 8: 2, pp. 93–114.
92. Sibanda, Mabutho and Merle Holden (2014) Institutional investors and the finance-growth nexus: Evidence from South Africa, Journal of Applied Business Research, 30:1, pp. 149-160.
93. Solarin, S. A. and J. Dahalan (2014) Financial development and economic growth in selected African countries: any role for stock markets? Economia Internazionale, 67:1, pp. 151-179.
94. Trew, Alex (2014) Finance and balanced growth, Macroeconomic Dynamics, 18:4, pp. 883–898.
95. Caporale, Guglielmo Maria, Christophe Rault, Anamaria Diana Sova and Robert Sova (2015) Financial development and economic growth: Evidence from 10 new European union members, International Journal of Finance & Economics, 20:1, pp. 4 8-60.
96. Ductor, Lorenzo and Daryna Grechyna (2015) Financial development, real sector, and economic growth, International Review of Economics and Finance, 37, pp. 393–405.
97. Gazdar, Kaouthar and Mondher Cherif (2015) Institutions and the finance--growth nexus: Empirical evidence from MENA countries, Borsa Istanbul Review, 15:3, pp. 137-160.
98. Georgantopoulos, Andreas G., Anastasios D. Tsamis and Maria-Eleni K. Agoraki (2015) The Euro-adoption effect and the bank, market, and growth nexus: New evidence from EU panels, Journal of Economic Asymmetries, 12:1, pp. 41–51.
99. Mansury, Yuri and Wook Sohn (2015) Are financial activities harmful for regional growth? Contradictory evidence from the Indonesian panel data, Applied Economics, 47:5, pp. 519–530.
100. Yaroson, Emilia (2015) Finance and growth in transition economies: What does bootstrapping tell us? American Journal of Economics, 5:6, pp. 553-564.
101. Ahmad, Rubi, Oyebola Fatima Etudaiye-Muhtar, Bolaji Tunde Matemilola and Amin Noordin Bany-Ariffin (2016) Financial market development, global financial crisis and economic growth: evidence from developing nations, Portuguese Economic Journal, 15:3, pp. 199-214.
102. Ahmed, Abdullahi D. (2016) Integration of financial markets, financial development and

growth: Is Africa different? Journal of International Financial Markets, Institutions & Money, 42, pp. 43-59.
103. Chowdhury, Murshed (2016) Financial development, remittances and economic growth: Evidence using a dynamic panel estimation, Margin — Journal of Applied Economic Research, 10:1, pp. 35–54.
104. Doumbia, Djeneba (2016) Financial development and economic growth in 43 advanced and developing economies over the period, 1975-2009: Evidence on no-linearity, Applied Econometrics and International Development, 16:1, pp. 13-22.
105. Haiss, Peter, Hannes Juvan and Bernhard Mahlberg (2016) The impact of financial crises on the finance–growth relationship: A European perspective, Economic Notes, 45:3, pp. 423–444.
106. Ishtiaq, Muhammad, Muhammad Tariq Majeed, and Muhammad Sohail (2016) Financial sector, democracy and economic growth: A panel data analysis, Pakistan Development Review, 55:4, pp. 437–453.
107. Kalaitzoglou Iordanis and Beatrice Durgheu (2016) Financial and economic growth in Europe: Is the Euro beneficial for all countries? Journal of Economic Integration, 31:2, pp. 414-471.
108. Nyasha, Sheilla and Nicholas M Odhiambo (2016) Financial systems and economic growth: empirical evidence from Australia, Contemporary Economics, 10:2, pp. 163-174.
109. Zhang, Ling, Sheng Zhang and Na Tao (2016) Financial system risk tolerance capacity and economic growth: Evidence from a cross-country analysis, Global Economic Review, 45:2, pp. 97-115.
110. Akpan, Emmanuel S., Eleazar C. Nwosu and Gamaliel O. Eweke (2017) Causality between non-oil export, financial sector development and economic growth: Evidence from Nigeria, Journal of Mathematical Finance, 7:1, pp. 39-53.
111. Assefa, Tibebe A. and André Varella Mollick (2017) Financial development and economic growth in Africa, Journal of African Business, 18:3, pp. 320-339.
112. Murari, Krishna (2017) Financial development–economic growth nexus: Evidence from South Asian middle-income countries, Global Business Review, 18:4, pp. 924-935.
113. Prochniak, Mariusz and Katarzyna Wasiak (2017) The impact of the financial system on economic growth in the context of the global crisis: empirical evidence for the EU and OECD countries, Empirica, 44:2, pp. 295-337.
114. Radjenovic, Tamara and Biljana Rakic (2017) Interdependence between level of financial system development and economic growth in Serbia, Journal of Balkan and Near Eastern Studies, 19: 6, pp. 645–665.
115. Williams, Kevin (2017) Does democracy dampen the effect of finance on economic growth? Empirical Economics, 52:2, pp. 635-658.
116. Alexiou, Constantinos, Sofoklis Vogiazas and Joseph G. Nellis (2018) Reassessing the relationship between the financial sector and economic growth: Dynamic panel evidence, International Journal of Finance and Economy, 23:2, pp. 155–173.
117. Capolupo, Rosa (2018) Finance, investment and growth: Evidence for Italy, Economic Notes, 47: 1, pp. 145–185.
118. Hino, Tomoko (2018) Impact of foreign direct investment and financial market development on economic growth, Journal of International Economic Studies, 32, pp. 25–37.

119. Lee, Chien-Chiang and Chun-Wei Lin (2018) Economic growth, financial market, and twin crises, Journal of International Trade & Economic Development, 27:8, pp. 937-967.
120. Rama, Arlind (2018) Investigating the nexus between financial development and economic growth in SEE 10 economies, European Journal of Marketing and Economics, 1:1, pp. 67-83.
121. Rapp, Marc Steffen and Iuliia A. Udoieva (2018) What matters in the finance–growth nexus of advanced economies? Evidence from OECD countries, Applied Economics, 50:6, pp. 676-690.
122. Sghaier, Imen Mohamed (2018) Foreign direct investment, financial development and economic growth in North African countries, Economic Alternatives, 4, pp. 527-540.
123. Shen, Chung-Hua, Xingyu Fan, Dengshi Huang, Hongquan Zhu and Meng-Wen Wu (2018) Financial development and economic growth: Do outliers matter? Emerging Markets Finance & Trade, 54:13, pp. 2925–2947.
124. Williams, Kevin (2018) Has the finance–growth link been broken? Panel data evidence from Latin America and the Caribbean, Economia, 19:3, pp. 404–423.
125. Anetor, Friday Osemenshan (2019) Foreign direct investment and economic growth nexus in Sub-Saharan Africa: Does financial sector development matter? Interdisciplinary Journal of Economics and Business Law, 9:2, pp. 122-143.
126. Asteriou, Dimitrios and Konstantinos Spanos (2019) The relationship between financial development and economic growth during the recent crisis: Evidence from the EU, Finance Research Letters, 28, pp. 238–245.
127. Bandura, Witness Nyasha and Canicio Dzingirai (2019) Financial development and economic growth in Sub-Saharan Africa: The role of institutions, PSL Quarterly Review, 72, pp. 315-334.
128. Benczúr, Péter, Stelios Karagiannis, and Virmantas Kvedaras (2019) Finance and economic growth: Financing structure and non-linear impact, Journal of Macroeconomics, 62, 103048.
129. Botev, Jaroslava, Balázs Égert and Fredj Jawadi (2019) The nonlinear relationship between economic growth and financial development: Evidence from developing, emerging and advanced economies, International Economics, 160, pp. 3-13.
130. Chung, Phan Thanh, Sizhong Sun and Diem Thi Hong Vo (2019) How does financial development interact with economic growth in five ASEAN countries? Singapore Economic Review, 64:3, pp. 441–460.
131. El Menyari, Younesse (2019) Financial development, foreign banks and economic growth in Africa, African Development Review, 31:2, pp. 190–201.
132. Gazdar, Kaouthar, M. Kabir Hassan, M. Faisal Safa and Rihab Grassa (2019) Oil price volatility, Islamic financial development and economic growth in Gulf Cooperation Council (GCC) countries, Borsa Istanbul Review, 19:3, pp. 197-206.
133. Inekwe, John Nkwoma, Yi Jin and Maria Rebecca Valenzuela (2019) Financial conditions and economic growth, International Review of Economics and Finance, 61, pp. 128-140.
134. Khan, Sher, Zhuangzhuang Peng and Yongdong Li (2019) Energy consumption, environmental degradation, economic growth and financial development in globe: Dynamic simultaneous equations panel analysis, Energy Reports, 5, pp. 1089-1102.
135. Oyinlola, Mutiu Abimbola and Abdulfatai Adedeji (2019) Human capital, financial sector development and inclusive growth in sub-Saharan Africa, Economic Change and

Restructuring, 52:1, pp. 43-66.
136. Nguyen, Yen Ngoc, Kym Brown and Michael Skully (2019) Impact of finance on growth: Does it vary with development levels or cyclical conditions? Journal of Policy Modeling, 41:6, pp. 1195-1209.
137. Oyinlola, Mutiu Abimbola and Abdulfatai Adedeji (2019) Human capital, financial sector development and inclusive growth in sub-Saharan Africa, Economic Change and Restructuring, 52:1, pp. 43-66.
138. Pessoa, Filipe de Morais Cangussu, Marcelo José Braga and Gabriel Alves de Sampaio Morais (2019) Economic growth and financial development in Brazil: A flexible regression model approach, CEPAL Review, No. 128, pp. 91-112.
139. Slesman, Ly, Ahmad Zubaidi Baharumshah and W.N.W. Azman-Saini (2019) Political institutions and finance-growth nexus in emerging markets and developing countries: A tale of one threshold, Quarterly Review of Economics and Finance, 72, pp. 80-100.
140. Sotiropoulou, Theodora, Stefanos G. Giakoumatos and Dimitrios P. Petropoulos (2019) Financial development, financial stability and economic growth in European Union: a panel data approach, Advances in Management & Applied Economics, 9:3, pp. 55-69.
141. Swamy, Vighneswara and Munusamy Dharani (2019) The dynamics of finance-growth nexus in advanced economies, International Review of Economics and Finance, 64, pp. 122-146.
142. Wang, Chao, Xinyi Zhang, Pezhman Ghadimi, Qian Liu, Ming K. Lim and H. Eugene Stanley (2019) The impact of regional financial development on economic growth in Beijing–Tianjin–Hebei region: A spatial econometric analysis, Physica A, 521, pp. 635-648.
143. Williams, Kevin (2019) Do political institutions improve the diminishing effect of financial deepening on growth? Evidence from developing countries, Journal of Economics and Business, 103, pp. 13-24.
144. Yang, Fan (2019) The impact of financial development on economic growth in middle-income countries, Journal of International Financial Markets, Institutions & Money, 59, pp. 74-89.
145. Younsi, Moheddine and Amine Nafla (2019) Financial stability, monetary policy, and economic growth: Panel data evidence from developed and developing countries, Journal of the Knowledge Economics, 10, pp. 238-260.
146. Bangake, Chrysost and Jude Eggoh (2020) Financial development thresholds and the remittances-growth nexus, Journal of Quantitative Economics, 18(2), pp. 425-445.
147. Dombi, Ákos and Theocharis Grigoriadis (2020) State history and the finance-growth nexus: Evidence from transition economies, Economic Systems, 44(1), 100738.
148. Liu, Guanchun and Chengsi Zhang (2020) Does financial structure matter for economic growth in China, China Economic Review, 61, Article 101194.
149. Oyinlola, Mutiu Abimbola and Abdulfatai Adekunle Adedeji (2020) Enhancing economic growth impact of financial development and human capital through capital flows in Sub-Saharan Africa, Journal of Economic Development, 45(2), pp. 95-114.
150. Sharma, Rajesh and Pradeep Kautish (2020) Linkages between financial development and economic growth in the middle-income countries of South Asia: A panel data investigation, Vision, 24:2, pp. 140-150.
151. Sugiyanto, Catur and Zefania Yolanda (2020) The effect of financial deepening on economic growth, inequality, and poverty: Evidence from 73 countries, South East European Journal

of Economics and Business, 15:2, pp. 15-27.
152. An, Hui, Qianmiao Zou and Mohamed Kargbo (2021) Impact of financial development on economic growth: Evidence from Sub-Saharan Africa, Australian Economic Papers, 60:2, pp. 226-260.
153. Ekanayake, E. M. and Ranjini Thaver (2021) The nexus between financial development and economic growth: Panel data evidence from developing countries, Journal of Risk and Financial Management, 14, Article 489.
154. Ghosh, Taniya, Prashant Mehul Parab and Sohini Sahu (2021) Analyzing the importance of forward orientation in financial development-economic growth nexus: Evidence from big data, Journal of Behavioral Finance, 22:3, pp. 280-288.
155. Muhammad, Faqeer, Naveed Razzaq, Khair Muhammad, and Rehmat Karim (2021) Do quality of governance, remittance and financial development affect growth? Evidence from Pakistan, Estudios de Economia Aplicada, 39:1, pp. 1-11.
156. Nazir, Muhammad Rizwan, Yong Tan and Muhammad Imran Nazir (2021) Financial innovation and economic growth: Empirical evidence from China, India and Pakistan, International Journal of Finance and Economics, 26(4) pp. 6036-6059.
157. Siddikee, Md. Noman and Mohammad Mafizur Rahman (2021) Foreign direct investment, financial development, and economic growth nexus in Bangladesh, The American Economist, 66(2), pp. 265-280.
158. Raghutla, Chandrashekar and Krishna Reddy Chittedi (2021) Financial development, real sector and economic growth: Evidence from emerging market economies, International Journal of Finance and Economics, 26(4), pp. 6156-6167.
159. Sena, Prince Mike, Grace Nkansa Asante and William Gabriel Brafu-Insaidoo (2021) Monetary policy and economic growth in Ghana: Does financial development matter? Cogent Economics & Finance, 9:1, Article 1966918.
160. Sghaier, Imen Mohamed (2021a) Remittances and economic growth in MENA countries: The role of financial development, Economic Alternatives, 1, pp. 43-59.
161. Swamy, Vighneswara and Munusamy Dharani (2021) Thresholds in finance–growth nexus: Evidence from G-7 economies, Australian Economic Papers, 60(4), pp. 1-40.
162. Ye, Dezhu, Yunjue Huang and Fanqing Zeng (2021) Does structural matching between finance and the real economy promote economic growth? International Review of Economics and Finance, 73, pp. 11-29.
163. Yousaf, Abida, Fozia Bibi, and Farhana Naz (2021) A cointegration analysis of financial liberalisation and economic growth in Pakistan (1972-2016), Pakistan Journal of Applied Economics, 31:1, pp. 77-98.
164. Yusheng, Kong, Jonas Bawuah, Agyeiwaa O. Nkwantabisa, Samuel O. O. Atuahene and George O. Djan (2021) Financial development and economic growth: Empirical evidence from Sub-Saharan Africa, International Journal of Finance and Economics, 26(3), pp. 3396-3416.
165. Agiropoulos, Charalampos, Michael L. Polemis, Michael Siopsis and Sotiris Karkalakos (2022) Revisiting the finance-growth nexus: A socioeconomic approach, International Journal of Finance and Economics, 27:3, pp. 2762-2783.
166. Bandura, Witness Nyasha (2022) Inflation and finance-growth nexus in Sub-Saharan Africa, Journal of African Business, 23:2, pp. 422-434.

167. Mhadhbi, Khalil and Chokri Terzi (2022) Shadow economy threshold effect in the relationship finance–growth in Tunisia: A nonlinear autoregressive distributed lag approach, Journal of International Development, 34:3, pp. 636-651.

168. Nguyen, Ha Minh, Quan Thai-Thuong Le, Chi Minh Ho, Thang Cong Nguyen and Duc Hong Vo (2022) Does financial development matter for economic growth in the emerging markets? Borsa Istanbul Review, 22:4, pp. 688-698.