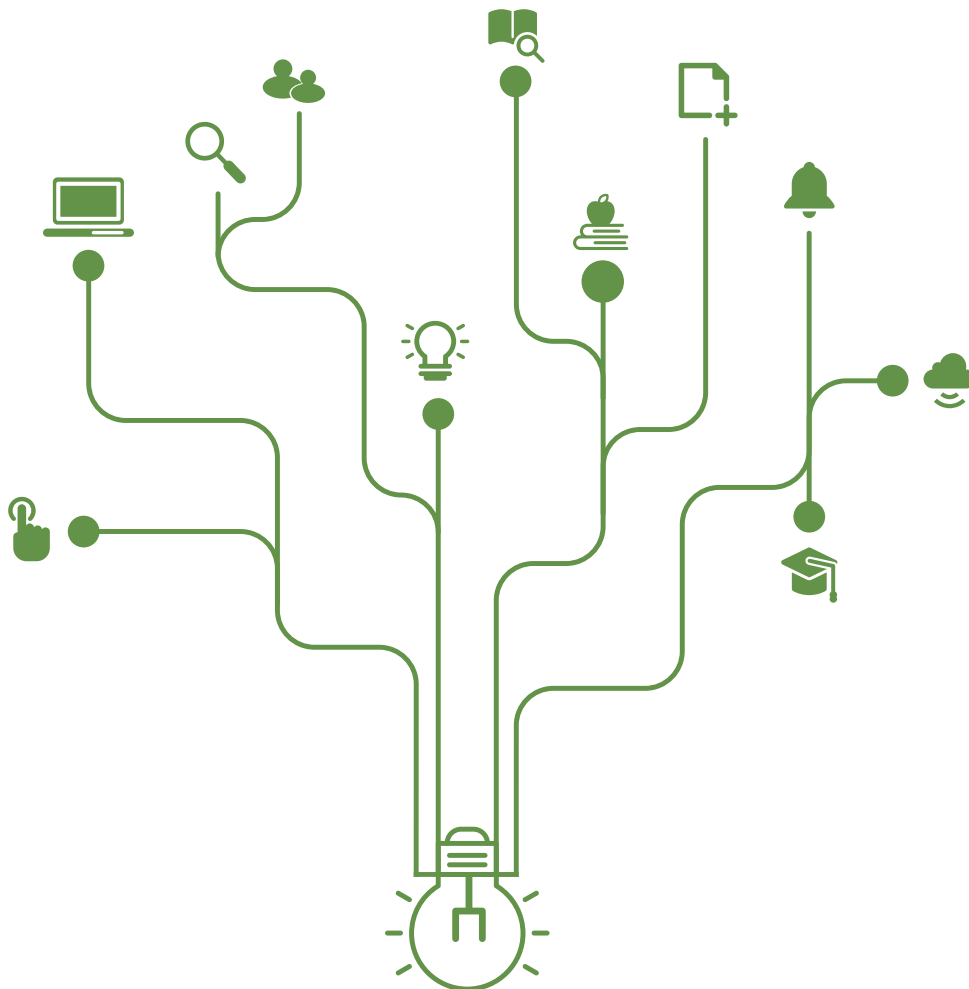


The Impact of Financial Inclusion Initiatives: A Meta-analysis

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*A Meta-analysis***

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THE IMPACT OF FINANCIAL INCLUSION INITIATIVES: A META-ANALYSIS

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Abstract

Developing inclusive financial system is an important policy intervention to create opportunities for economic development, reduce poverty and improve the livelihood of the poor. Despite the growing and focused research interest on financial inclusion, empirical findings on the role of financial inclusion to accelerate economic development are mixed and inconclusive. This limits the building of a cumulative and conclusive evidence base to inform policies and strategies to address financial exclusion. The purpose of this study is to provide a comprehensive synthesis of empirical studies on the impact of financial inclusion and unravel the sources of inconsistencies in financial inclusion studies. The study extracts and analyzes, through meta-regression analysis, the dependent and independent variables and estimates from 67 empirical studies. The results indicate that empirical research on financial inclusion conflates two related but distinct concepts of participation of the poor in the formal and informal financial sectors. There is also inconsistent measurement of financial inclusion and outcome indicators. Overall, regardless of the inconsistency in measurement, financial inclusion has a statistically significant positive effect on household livelihood outcomes. We note that the inconsistency in measurement and quality of the empirical evidence raises concerns about the reliability of the overall findings.

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1. Introduction

The economic environment in most developing countries is characterized by limited access to formal financial systems. For example, 75% of adults in Sub-Saharan Africa do not have a bank account (CGAP (2014)). In particular, vulnerable populations such as the poor, women and young people are excluded from financial systems as they have informal jobs and no means of formal saving. Although there are improvements in different countries to reduce financial exclusion, reduction strategies have missed the poorest of the poor in rural areas (World Bank, 2019). Nonetheless, developing inclusive financial systems has been considered as one of the key areas of activity to enhance household livelihoods and stimulate economic and social development (Churchill & Marisetty, 2020; C.-Y. Park & J. R. Mercado, 2018; Turegano & Herrero, 2018). Financial inclusion is defined as the extension of access to affordable financial services to unbanked poor people who previously had no access to formal financial institutions, through the implementation of tailored and innovative initiatives (Demirgüç-Kunt & Klapper, 2013; Sarma & Pais, 2011). The services include saving, investing, borrowing, insurance, financial awareness and education. The objective of financial inclusion initiatives is to promote financial well-being as well as economic and social inclusion.

Financial inclusion features prominently among the SDGs, and in that forum, is seen to contribute to poverty alleviation and lower income inequalities. The size of a country's financial institutions and accessibility of financial services across households appear to be related to various measures of economic development. The size of a country's financial and banking sectors – measured as the aggregate value of private sector credit as a share of GDP – is correlated with economic growth and the level of development (Beck, Levine & Loayza 2000; Levine 2005), while participation in the formal financial sector appears to be positively related to poverty alleviation (Burgess & Pande 2005). Thus, the efforts to deliver affordable

financial services – transactions, payments, savings, credit and insurance – in a responsible and sustainable way those who have been excluded from the formal financial services is vital in enchaining the livelihood of the poor.

Scholars and policy makers advocate that access to finance can build the capacity of households to manage financial shocks, invest in human capital, agriculture, health, education and help the poor to engage in productive business activities and leverage opportunities in their environment (Giné, Goldberg, & Yang, 2011). Given the widely accepted belief that financial inclusion has a considerable impact on sustaining household livelihoods (Fomum & Jesse, 2017; L. Li, 2018; Sharma, 2016a), researchers and policy makers are interested in understanding the antecedents, challenges and outcomes of financial inclusion. The relationship between financial inclusion, household livelihood, and poverty related issues has attracted research across the disciplines of economics, social policy and financial systems with methods ranging from case studies of specific financial inclusion initiatives to cross-country regressions analysis. Nonetheless, the empirical work on the relationship between financial inclusion, household level outcomes and economic development is mixed and often unclear with respect to the extent of the resultant benefits and for whom they occur or do not occur (Demirguc-Kunt, Klapper, & Singer, 2017; Lim, Aquino, Garcia, Ong, & Soliman, 2020; Mader, 2016). For example, some studies (e.g., Cull, Demirgüç-Kunt, & Lyman, 2012; Okpara, 2011; Prasad, 2010) argue that by providing large sections of society, including vulnerable communities, with greater access to and efficient use of banking services, financial inclusion initiatives ensure resource productivity and financial intermediation. This in turn, enhances financial stability, in countries that have enhanced financial infrastructure and professional supervision. Other studies (e.g., Levine, 2005; Sarma & Pais, 2011), note that financial inclusion may not necessarily contribute to household financial stability.

Based on a variety of different underlying research approaches, including quantitative and qualitative work and using cross-sectional and longitudinal evidence, some scholars have sought to clarify the effects of financial inclusion on disadvantaged people in low- and middle-income countries. However, with many of these studies focusing narrowly on microfinance, and many focusing even more narrowly on microcredit, they have considerably undermined the multidimensional nature of financial inclusion (Cabeza-García, Del Brio, & Oscanoa-Victorio, 2019; Demirgüç-Kunt & Klapper, 2013), and this poses a challenge for researchers, policymakers and practitioners when seeking to assess and establish the real impact of finance-based interventions on household livelihood outcome. Further, primary studies have tried to understand more widely the impacts of financial inclusion initiatives, especially on macro-structural changes (Cull, Ehrbeck, & Holle, 2014; Demirgüç-Kunt & Klapper, 2013), but the meta-analysis evidence has not yet progressed as far. Therefore, despite the growing and focused research interest on financial inclusion, empirical findings on the role of financial inclusion to accelerate economic development are mixed and inconclusive. This limits the building of a cumulative and conclusive evidence base to inform policies and strategies to address financial exclusion to understand the sources of such differences, advance the body of work and its value for development policy and impact, it is imperative to undertake a meta-analysis of the extant literature. Thus, the purpose of this study is to provide a comprehensive synthesis of empirical studies on the impact of financial inclusion and unravel the sources of inconsistencies in financial inclusion studies.

The intellectual relevance of a meta-analysis comes from the pressing need to take a more comprehensive stock of the existing literature as a basis of providing stronger evidence towards policy recommendations, theory development, and future research. Meta-analysis enables various studies to be combined and contrasted, with a view to recognizing trends in established outcomes and other related associations that can only be found in multiple studies

(Akhter & Daly, 2009). With the development of large databases of information and a growing attention of scholars on the impact of financial inclusion over the past few years, growth regression equations are more accurate than the widely used linear regression for the analysis of the macro-economic impact of financial inclusion on household level outcomes (Leon-Gonzalez & Montolio, 2015). Therefore, the meta-analysis we undertake in this study is based on the findings of these regression analysis results. We pay special attention to the synthesis of the empirical evidence on the relationship between financial inclusion and household livelihood related outcomes in the current literature.

This meta-analysis study contributes in several ways. First, the study contributes to the collective understanding of the impact of financial inclusion policies and programs and the need for its expanded implementation within developing countries. Second, it establishes whether the estimated effects of financial inclusion on livelihood related changes can be considered as indicator of genuine impact measure. The meta-analysis can help to confirm the accuracy of estimates by statistically integrating the empirical findings from existing research (Duvendack & Mader, 2020). This helps to address the inconsistent findings among individual studies, improve estimates effect size, and to establish a general and validated conclusion on the outcomes of financial inclusion. Finally, the study helps to assess the strengths and weaknesses of the current research in the field and, on that basis, to identify new avenues for future research.

The rest of the paper is organized as follows. Section 2 discusses the concept and measurement of financial inclusion and the consequences of financial inclusion. Section 3 explains the data and the methodology used to search potential studies and data extraction methods. Section 4 presents the results of the meta-analysis. Section 5 provides the discussion while the last section concludes and offers some policy recommendations.

2. Literature Review

The body of work on financial inclusion can be broadly divided into the demand side of financial inclusion and the supply side of financial inclusion (Sharma, Jain, & Gupta, 2014). While the demand side studies usually focus on the financial consumers literacy and capability (Kundu, 2015), the supply side focuses on the availability and accessibility of financial services (Adi & Jalil, 2020). From developing economies perspective, which is the focus of this paper, the emphasis is on the supply side because scholars, development institutions and policy makers associate financial exclusion as one source of poverty and inequality (Dunham, 2019; Stewart, 2010). They recognize promoting financial inclusion as an important “building block for both poverty reduction and opportunities for economic growth” (World Bank, 2017) and enhance household livelihoods (Demirguc-Kunt et al., 2017; Park and Mercado, 2018). This literature on financial inclusion falls into three broad themes

- Concepts and measures of financial inclusion and exclusion at macro, meso, household and individual level (see e.g., Goel, 2017; Ismail, 2012; Demirgüç-Kunt & Klapper, 2013)
- Antecedents of financial inclusion e.g., infrastructure, education, technology, culture, etc (see e.g., Le et al, 2019; Dar & Ahmed, 2020; Senyo & Osabutey, 2020)
- Consequences of financial inclusion, i.e., the direct and indirect effects of financial inclusion such as poverty reduction, economic growth, income equality, assets, gender equality, etc (see e.g., Koomson et al., 2020; Churchill & Marisetty, 2019; Park & Mercado, 2018)

This paper focuses on the consequence of financial inclusion. As a result, the ensuing two sub-sections review the literature to highlight how the dependent and independent variables of the consequences of financial inclusion are conceptualized and measured.

2.1. The concept and measurement of financial inclusion

Financial inclusion is one of the most widely recognized areas of intervention in economic development and poverty reduction initiatives. Although some findings remain inconclusive, a large body of empirical research over the past decade draws attention to the role of ‘financial inclusion’ as a means of wealth accumulation for the poor and an enabler of poverty alleviation, particularly in developing economies that are associated with relatively small and under-developed financial systems (Demirgüç-Kunt & Klapper, 2013).

Scholars investigating the impact of financial inclusion use various proxy such as bank account, financial development, and how financial decisions are made as summarized in Table 1 and discussed next.

Table 1: Financial inclusion measures and indicators

Dimension of financial inclusion	Key argument	Indicators	Sample references
Bank account status	Formal financial institutions facilitate financial development	Penetration of bank accounts, bank branches and ATMs,	Akudugu, 2013; Allen et al., 2014; Andrianaivo & Kpodar, 2011; Chikalipah, 2017
Financial development		Ratio of private sector outstanding credit or deposits to GDP	Onwuka, 2014; Bihari, 2011; Inoue, 2019a; Inoue & Hamori, 201
Financial decision making	How the financial sector facilitates the decisions of how to borrow, save, make pay and manage financial risk	Global Findex database	Abor, Amidu, & Issahaku, 2018; Demirgüç-Kunt & Klapper, 2013;

Studies that focus on bank account status as a measure of financial inclusion point to the important role of formal financial institutions in facilitating financial development (Akudugu, 2013; Allen et al., 2014; Andrianaivo & Kpodar, 2011; Cámara & Tuesta, 2014; Chikalipah, 2017; De Koker & Jentzsch, 2013). The commonly used measures of financial inclusion among these studies include the number of bank branches, automatic teller machines (ATMs) and/or bank accounts, with these variables typically expressed as a percentage of the population or in spatial terms (eg. branches or ATMs per square kilometer) (Bihari, 2011; Katsushi S. Imai, Gaiha, Thapa, & Annim, 2012; Inoue, 2019b; Neaime & Gaysset, 2018; C.-Y. Park & R. Mercado, 2018; Sharma, 2016b; Thai-Ha, Anh Tu, & Farhad, 2019; Van & Linh, 2019). Other studies of financial inclusion draw on the research on financial development by using various macroeconomic variables to measure financial inclusion, particularly the ratio of private sector outstanding credit or deposits to GDP (Agbaeze & Onwuka, 2014; Bihari, 2011; Inoue, 2019b; Inoue & Hamori, 2013; Kim, 2015; C.-Y. Park & R. Mercado, 2018; Sehrawat & Giri, 2016a, 2016b; Thai-Ha et al., 2019; Van & Linh, 2019). The main macroeconomic variable used to capture financial inclusion and/or financial development is the ratio of credit outstanding to a country's GDP (Sehrawat & Giri, 2016a, 2016b). The studies of panel data or cross-sectional data either rely on their preferred measure of financial inclusion, multiple measures or develop a multi-dimensional index of financial inclusion in the spirit of Sarma (2008); see for instance Kim (2015) and C.-Y. Park & R. Mercado (2018).

Others draw from the Global Findex database, which provides insights into how the financial sector facilitates the financial decision making of how people borrow, save, make payments and manage financial risk (Demirgüç-Kunt & Klapper, 2013). The importance of borrowing decisions is reflected in studies which use loan account status or access to credit as

measures of financial inclusion (Abor, Amidu, & Issahaku, 2018; Allen et al., 2014; Andrianaivo & Kpodar, 2011; Ibrahim & Aliero, 2020; L. Li, 2018). The importance of savings decisions is reflected in studies which use deposit account status as a measure of financial inclusion (Abor et al., 2018; Aga & Peria, 2014; Akudugu, 2013; Allen et al., 2014; Andrianaivo & Kpodar, 2011; Beck, Senbet, & Simbanegavi, 2015; Chikalipah, 2017; De Koker & Jentzsch, 2013; Ibrahim & Aliero, 2020; Katsushi S. Imai et al., 2012; Laha, Kuri, & Kumar, 2011).

Despite the focus of many studies on financial inclusion on the formal sector and bank account status, recent studies have been delving into other financial development initiatives beyond the formal financial institutions in promoting financial inclusion and enhance consumer welfare of the poor. The development of mobile money represents an example of a payments platform developed outside of the scope of the formal financial system, whose antecedents can be traced to the absence of a well-developed formal sector (Aker & Mbiti, 2010).

2.2. Consequences of financial inclusion

Financial inclusion features prominently among the 2030 Sustainable Development Goals. In that forum, it is seen to contribute to the eradication of poverty, reducing income inequalities, ending hunger, promoting food security and sustainable agriculture, and facilitating gender equality and economic empowerment of women. The consequences of financial inclusion have been assessed using panel data or cross-sectional data on two main outcome indicators (Table 2).

Table 2: Consequences of financial inclusion measures and indicators

Consequences of financial inclusion	Argument	Indicators	Sample references
Poverty	Financial inclusion and financial development are associated with poverty alleviation	Poverty rate (percentage of the population living at or below a pre-determined poverty line); consumption and/or income among poor households	Abor et al., 2018; Katsushi S. Imai et al., 2012; Inoue, 2019a
Income inequality	low financial inclusion is associated with larger increases in inequality	Gini coefficient	Furceri & Loungani, 2018; Kim, 2015; Neaime & Gaysset, 2018;

2.2.1. Poverty Alleviation

For those studies that examine the link between financial inclusion and poverty the poverty rate represents the most commonly used measure of poverty, measured as the percentage of the population living at or below a nationally pre-determined poverty line (Abor et al., 2018; Katsushi S. Imai et al., 2012; Inoue, 2019b; Inoue & Hamori, 2013; Neaime & Gaysset, 2018; C.-Y. Park & R. Mercado, 2018). Another less commonly used measure is consumption and/or income among poor households (Sehrawat & Giri, 2016a, 2016b). Several studies show that various measures of financial inclusion and financial development are associated with poverty alleviation (Abor et al., 2018; Inoue, 2019b; Inoue & Hamori, 2013; C.-Y. Park & R. Mercado, 2018; Sehrawat & Giri, 2016a, 2016b). For instance, Access to mobile telephony and ownership of a bank account lower the probability of Ghanaian households being below the poverty line and raise household consumption, in part reflecting the fact that mobile phones reduce the cost of information acquisition,

facilitate the transfer of money and are associated with lower communication costs (Abor et al., 2018). However, in a panel data analysis of 76 developing countries (Inoue & Hamori, 2013), various measures of financial inclusion – per capita number of microfinance institutions (MFIs) and the aggregate credit to GDP ratio – are negatively associated with the poverty rate .

The penetration of public sector banks in terms of customer accounts and number of branches on a per capita basis is negatively related to poverty in India, while there was no relationship between commercial bank penetration and poverty alleviation (Inoue, 2019b). Financial inclusion based on a multi-dimensional index was associated with lower poverty for a full panel data set of 176 countries from 2004 to 2012, but not for a sub-set of 37 developing Asian countries (C.-Y. Park & R. Mercado, 2018). Financial development as measured by growth in the credit to GDP ratio is associated with poverty alleviation in India from 1970 to 2012 (Sehrawat & Giri, 2016a). The same measure of financial development is also associated with lower poverty in a panel data set of eleven South Asian developing countries from 1990 to 2012 (Sehrawat & Giri, 2016b).

2.2.2. Income Inequality

Studies have also examined the impact of financial inclusion and financial development on income inequality with Gini coefficient as the most used measure of income inequality (Furceri & Loungani, 2018; Kim, 2015; Neaime & Gaysset, 2018; C.-Y. Park & R. Mercado, 2018). For a panel data set of 149 countries from 1970 to 2010, episodes of capital account liberalization are associated with greater income inequality, with larger increases in inequality experienced by countries with weak or low quality of financial institutions and low financial inclusion (Furceri & Loungani, 2018). More specifically, Furceri & Loungani (2018) show that liberalization episodes in countries with low levels of financial inclusion are

associated with increases in inequality of more than 3% or one standard deviation of the average change in the Gini coefficient. Based on a multi-dimensional index of financial inclusion, higher financial inclusion moderates the inverse relationship between income inequality and GDP growth, particularly among low income countries (Kim, 2015).

Financial inclusion is associated with lower income inequality for a full sample of 176 countries from 2004 to 2012, but not developing Asia (C.-Y. Park & R. Mercado, 2018). The penetration of bank branches is shown to be negatively and significantly related to income inequality in the Middle East & North Africa region from 2002 to 2015, while the penetration of ATMs has no association with income inequality (Neaime & Gaysset, 2018). On balance, the above review suggest that financial inclusion is associated with poverty alleviation and lower income inequality. With this background, we move now move to the meta-analysis discussion

3. Meta-Analysis Method Overview

Meta-analysis is quantitative synthesis of research results to reach an overall understanding of a problem and identify sources of variation in outcomes (Gurevitch et al., 2018). Meta-analysis has generally been used to reach broad generalizations across numbers of studies to clarifying, quantifying and proving or disproving assumed understanding on specific interventions. Meta-analysis can be a key tool in facilitating rapid progress in science by quantifying what is known and identifying what is not yet known. As such, identifying various studies with heterogeneity in outcomes is often central to conduct meta-analysis study (Suurmond et al., 2017).

3.1. Search strategy for potential studies

To identify and classify qualifying studies for our review and analysis, we began by focusing on work referenced in the existing financial inclusion literature. We selected

databases based on the experience of our research team, with the aim of sourcing three forms of publication: published studies, working papers and reports (Fernández-Olit, Martín, & González, 2019). We searched eight databases including Google Scholar, Science Direct, Scopus, JSTOR, DOAJ, Web Science, World Bank, and IMF databases. Once we had identified the most appropriate databases, we used a pre-specified list of keywords. For our independent variable, we used keywords including: “financial inclusion”, “financial access”, “credit access” “micro credits” “saving services”, “financial literacy” “bank accounts”. For our outcome variable, considering financial inclusion studies typically examine a wide range of livelihood indicators, we used “income, assets, expenditure, consumption, personal networks, gender/empowerment, well-being, health”. We note at this point that, though the scope of the extant empirical studies varies, the populations targeted by researchers is quite demographically rigid. The vast majority of the studies into the impact and outcomes of financial inclusion on households sourced as a result of our keyword searches are from developing countries and focus on the supply side of financial inclusion. In an attempt to counter this perceived bias, we also proactively searched for studies in which the population of participants were drawn from developed economies.

Our search period parameter extended from 2000 to 2020, starting from the period when the World Bank began integrating financial inclusion concepts into its Structural Adjustment Programs (Duvendack et al., 2011). However, we also undertook snowballing of relevant articles to make sure that we did not exclude any important study prior to 2010. In other words, by adopting snowballing procedures, we were able to identify key studies published prior to 2010 that may not have been keyword-identifiable within our database catchment. At the completion of our search process, we had collected 3,145 studies. We identified 419 duplicates during initial screening, which we subsequently excluded. Thus, the initial search resulted 2,726 potentially relevant studies for the review process.

Following T. D. Stanley et al. (2013) recommendations to undertake meta-analysis in economics and business research field, we initially searched in title, abstract and keyword for dependent and independent variables. We then combined the identified studies with those highlighted in full text searches. We directed a team of research assistants to conduct this search activity under the supervision of the principal researchers.

3.2. Inclusion and Exclusion Criteria

The titles and abstracts of 2,726 potentially relevant studies were screened by the principal investigators and researcher assistants to eliminate obviously irrelevant papers. Following the screening of titles and abstracts, all of the involved researchers discussed to agree upon the subsequent evaluation process and the criteria for the exclusion of studies based on the methodology utilized for the study. We disqualified all studies that adopted a qualitative or dual approach. Studies that used qualitative methods were not qualified to extract information about observable sources. We eliminated dual approach studies because they are based on different specifications for factor demand equations derived from a linear function representation of financial inclusion because financial inclusion can be represented by different measurement items including financial literacy, access or quality services (Akhter & Daly, 2009). We also note that we excluded Translog or quadratic model studies because their estimates of the financial inclusion effects are non-linear (Blundell & Robin, 1999). Finally, we excluded studies that reported starred coefficients without standard errors or t-values. Of the 2,726 articles, we qualified 237 publications for evaluation on the basis of the exclusion criteria.

We then used primary inclusion criteria to confirm the final set of studies for data extraction by considering each remaining study from the following standpoint:

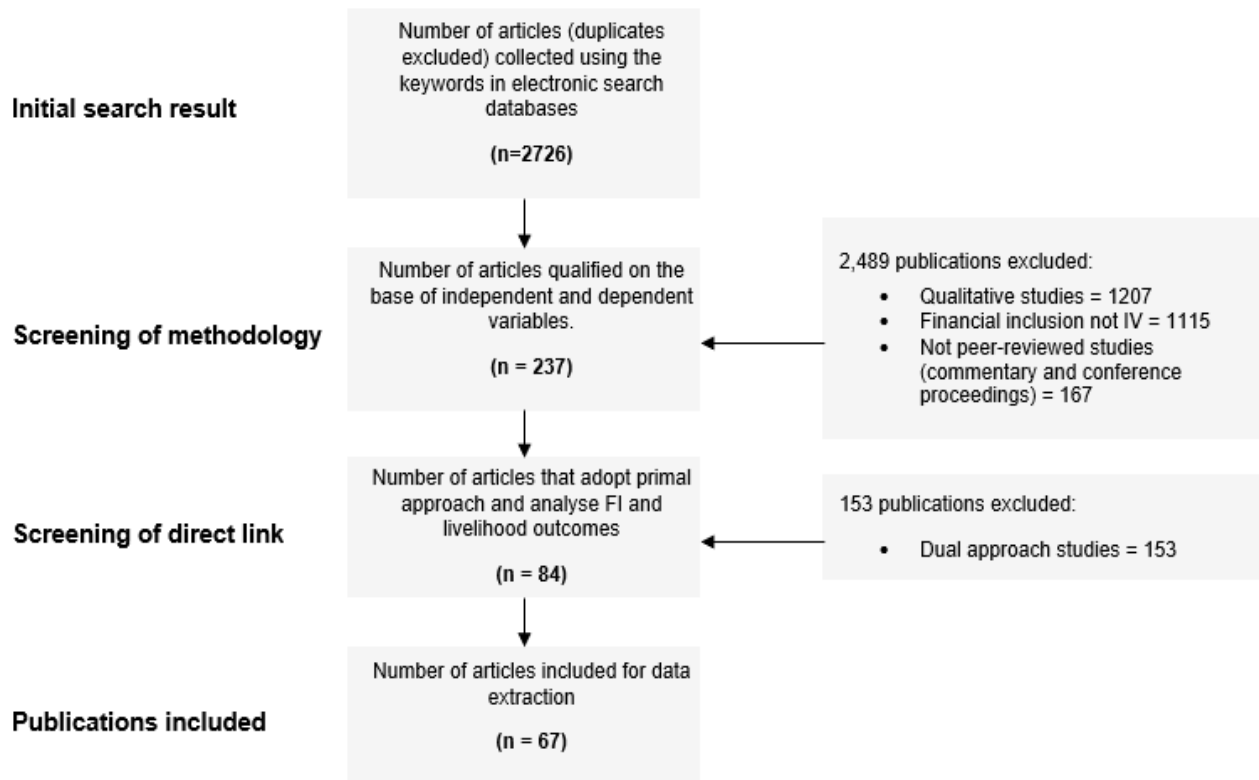
- a) Does the study analyze the link between financial inclusion and livelihood related indicators?
- b) Does the study estimate the link between financial inclusion and livelihood related indicators?

If the answer was 'yes' for the first question were selected for the next stage, i.e. for the critical evaluation and inclusion/exclusion stage. Then, we coded the studies that estimate the relationship between financial inclusion and household livelihood related indicators. This evaluation encompassed the full text of each study and focused on the two questions mentioned above. While the principal investigators made the screening decisions, a research assistant conducted random checks on the decisions using these parameters as a guide.

As discussed, our target studies are those with clearly specified regression model and an estimation methodology appropriate for estimating the outcomes and measurements of financial inclusion. As such, we obtained a sample of 84 studies that adopt the primal approach. At the end of reviewing the full text, the final relevant list of studies qualified for data extraction and analysis dropped from 84 to 67 studies. A list of studies included for the analysis are presented in Appendix 1.

To describe the process of selecting the studies for meta-analysis, we present a flow chart in Figure 3 below.

Figure 3: Schematic representation of the selection of articles for meta-analysis



3.3. Data extraction

Our initial review in section 2 reveals that the extant literature regularly considers the effect of financial inclusion on livelihood related changes, though the focus over time has been fragmented and the context of the consideration quite diverse. It is necessary to find some means to account for the variation that exists between studies with respect to country type, estimation method, model specification, and financial inclusion/household livelihood indicators. In that way, the critical assessment and data extraction process can provide us with a summary of the empirical findings that we can synthesize to establish evidence-based results. As such, the relevance of the theoretical/analytical framework presented above have reviewed and discussed. In order to provide a clear overview on the existing financial inclusion literature, we synthesized to the extracted estimates at a disaggregated level instead

of aggregating and clustered the selected studies. This is due the need to consider for the observational nature of the empirical studies and for between-study heterogeneity. Thus, we conduct Precision-effect test at different levels of disaggregation, comparing the results with respect to consistency, and the test results indicate the existence of genuine effect at different levels of disaggregation.

Before drafting the report, the review team discussed the implications of the synthesized evidence for policy, practice and research. In that discussion in our initial assessment, we establish that the weight of the theoretical/analytical and empirical evidence points to a positive effect from financial inclusion on livelihood related indicators. However, this synthesized evidence differs between studies, study clusters, estimation methods, and country types. Therefore, we decided that the policy and practice conclusions should be stated with explicit reference to the type of financial inclusion and the livelihood change measurement as this was the clear difference between the studies and an area which merits further research in terms of how best to measure financial inclusion to inform international development policy. We also decided that it is necessary and appropriate to qualify our policy recommendations with statements on the strengths and limitation of meta-analysis based on observational studies.

We show that both theoretical, analytical and empirical work on the relationship between financial inclusion and household livelihood has made considerable progress in terms of quantity and quality with regard to research implications. However, we also indicate that there is considerable scope for improvement and consistency with regard to model specification, measurement of financial inclusion and robustness tests.

3.4. Meta-analysis tools and methods

In reviewing the literature on financial inclusion and the outcomes on livelihood related changes, we adopt two main meta-analysis tools. First, while holding other explanatory variables constant, we calculate partial correlation coefficients (PCCs) to ensure comparability across studies that measure the relationship between financial inclusion and household livelihood indicators. According to Ugur (2014), as they are independent of the metrics used in measuring both the independent and dependent variables, PCCs enable comparability across studies. Although elasticities can be a plausible alternative to compare estimated effects across studies, the primary studies do not provide the information needed to calculate elasticities. Thus, previous studies in meta-analysis (see, e.g., Chliova, Brinckmann, & Rosenbusch, 2015; Doucouliagos & Ulubaşoğlu, 2008; Hawkes & Ugur, 2012; Ugur, 2014) have used PCCs extensively. Second, in order to provide a summary of the empirical evidence reported by each primary study, we compute, and report fixed effect estimates (FEEs) of the PCCs.

3.4.1. Empirical models

Following Greene (2011), we use equation one to calculate PCCs (r_i) directly from primary study regression outputs and we use equation two to compute the standard errors (SE_{ri}) for each effect-size estimate.

$$r_i = \frac{t_i}{\sqrt{t_i^2 + df_i}} \quad (1)$$

and

$$SE_{ri} = \sqrt{\frac{1 - r_i^2}{df_i}} \quad (2)$$

Where r_i and SE_{ri} are the PCC and corresponding standard errors to be calculated from individual studies. t_i and df_i are the t-statistic and degrees of freedom that correspond with each estimate reported in the primary studies.

Given that the effect-sizes reported by the primary studies are derived from the same population and have a common mean, FEEs are efficient in providing suggestive evidence presented by each primary study (T. D. Stanley, Jarrell, & Doucouliagos, 2010). We calculate the FEEs' weighted means based on the approach adopted by previous studies (e.g., Chliova et al., 2015; T. Stanley & Doucouliagos, 2007; Ugur, 2014). These studies noted that the FEEs can be calculated using the following Equation (3).

$$\dot{X}_{FEE} = \frac{\sum r_i(1/SE_{ri}^2)}{\sum 1/SE_{ri}^2} \quad (3)$$

Where X_{FEE} is the FEE weighted mean, and all other variables remain as they are above. FEE weighted means disseminate weights in a way that less precise estimates are assigned lower weights and vice-versa. This accounts for within-study variations. However, given that primary studies may be affected by within-study dependence and/or may be subject to publication selection bias, they are only taken as a descriptive summary of the evidence base and not as measures of genuine effect (De Dominicis, Florax, & De Groot, 2008; Ugur, 2014).

4. Synthesis Results

In this section, we report the meta-analysis results for the 67 studies based on outcomes reported in the set of empirical studies in relation to financial inclusion. The studies were used financial inclusion as independent variable and indicators of household livelihoods such as consumption, income, assets and other related indicators as dependent variables. For each study, we present the statistical summary consisting of the number of estimates, the

weighted mean, the standard deviation, the weighted confidence interval, and the significance. Finally, we report the weighted averages of estimates.

4.1. Financial inclusion on consumption

Table 4.1a presents fixed effect weighted means of the PCCs for each primary study that reports the effect of financial inclusion on household consumption. We identify 25 empirical studies with a total of 307 estimates using consumption as the indicator of livelihood. The analysis results show that of these 25 primary studies, only 9 studies (36% of the total number of studies) with 114 estimates (37.14% of total estimates) present statistically significant weighted means. We note that 13 studies (52% of the studies) with 190 estimates (61.89% of total estimates) were found to not have statistically significant weighted means.

We find all the statistically significant weighted means are positive. Thus, based on the PCCs calculated for each primary study using consumption as an indicator of household livelihoods, we conclude that, as expected, the effects of financial inclusion on household livelihoods are positive. We also found the net fixed effect weighted average for all 25 studies to be positive, with a magnitude of 0.0307.

Table 4.1A. Fixed effect weighted means per study on financial inclusion and consumption

Paper	No. of estimates	Weighted Mean	Std. Err.	Signif.	Conf. Interval
Abor et al. (2018)	12	0.0929	0.0210	Yes	(0.0467, 0.1391)
Abou-Ali, El-Azony, El-Laithy, Haughton, & Khandker (2009)	15	0.0066	0.0222	No	(-0.041, 0.0543)
Alam (2012)	77	0.0081	0.0047	No	(-0.0013, 0.0176)

Paper	No. of estimates	Weighted Mean	Std. Err.	Signif.	Conf. Interval
Ashraf, Karlan, & Yin (2010)	9	-0.0047	0.0056	No	(-0.0177, 0.0083)
O Attanasio, Augsburg, De Haas, Fitzsimons, & Harmgart (2011)	8	0.0216	0.0035	Yes	(0.0133, 0.030)
Augsburg, De Haas, Harmgart, & Meghir (2012)	5	-0.0257	0.0108	No	(-0.0556, 0.0041)
Banerjee, Duflo, Glennerster, & Kinnan (2009)	23	0.0093	0.0058	No	(-0.0027, 0.0212)
Berhane & Gardebreek (2011)	8	0.1604	0.0586	Yes	(0.0218, 0.2990)
Brune, Giné, Goldberg, & Yang (2011)	6	0.0089	0.0085	No	(-0.0129, 0.0308)
Cuong (2008)	8	0.0416	0.0057	Yes	(0.0282, 0.0550)
Dupas & Robinson (2011)	12	0.1204	0.0056	Yes	(0.1081, 0.1326)
Gertler, Levine, & Moretti (2009)	9	0.0299	0.0063	Yes	(0.0154, 0.0444)
Hoque (2004)	6	0.0201	0.0277	No	(-0.0512, 0.0913)
Ibrahim, Ozdeser, & Cavusoglu (2019)	1	0.4369	.		
Katsushi S Imai & Azam (2012)	9	0.0230	0.0050	Yes	(0.0115, 0.0346)
Islam (2009)	18	0.0054	0.0070	No	(-0.0095, 0.0203)
Islam (2011)	12	0.0476	0.0265	No	(-0.0107, 0.1059)
Kaboski & Townsend (2012)	24	0.0158	0.0028	Yes	(0.0099, 0.0217)
L. Li (2018)	6	0.0049	0.0112	No	(-0.0239, 0.0338)
X. Li, Gan, & Hu (2011)	2	0.1485	0.1107	No	(-1.2586, 1.5555)

Paper	No. of estimates	Weighted Mean	Std. Err.	Signif.	Conf. Interval
Nghiem, Coelli, & Rao (2012)	3	-0.0376	0.0822	No	(-0.3912, 0.3160)
Pitt & Khandker (1998)	24	0.0237	0.0052	Yes	(0.0130, 0.0344)
Sehrawat & Giri (2016a)	1	0.2209	.		
Sehrawat & Giri (2016b)	1	0.3433	.		
Takahashi, Higashikata, & Tsukada (2010)	8	0.0487	0.0490	No	(-0.0672, 0.1647)
Total	307	0.0307			

4.2. Financial inclusion on income

We also identify 19 primary studies with 145 estimates that report on the association between financial inclusion and income, as presented in Table 4.1b. We find that 11 studies (57.9% of the total number of primary studies) with 67 estimates (46.21%) have statistically insignificant means. Whereas eight studies (42.1% of the total number of primary studies) with 78 estimates (53.79%) have statistically significant means. We also find that majority of studies (seven out of eight studies) in this category have positive weighted means. This suggests that, based on the PCCs calculated for studies in this category, the effect of financial inclusion on income are positive as well, with a net fixed effect weighted average of 0.0284.

Table 4.1B. Fixed effect weighted means per study on financial inclusion and income

Paper	No. of estimates	Weighted Mean	Std. Err.	Signif.	Conf. Interval
Abou-Ali et al. (2009)	5	-0.0428	0.0266	No	(-0.1166, 0.0310)
Terfa W Abraham (2018)	2	-0.0314	0.0883	No	(-1.1537, 1.0909))
O Attanasio et al. (2011)	8	-0.0115	0.0031	Yes	(-0.0189, -0.0041)
Copestake (2002)	4	0.0571	0.0449	No	(-0.0858, 0.2001)
Copestake, Bhalotra, & Johnson (2001)	2	-0.0360	0.0841	No	(-1.1040, 1.0320)
Copestake, Dawson, Fanning, McKay, & Wright-Revollo (2005)	5	0.0116	0.0435	No	(-0.1091, 0.1323)
Cotler & Woodruff (2008)	3	0.0387	0.0184	No	(-0.0406, 0.1181)
Cuong (2008)	8	0.0367	0.0066	Yes	(0.0211, 0.0523)
Dupas & Robinson (2011)	4	0.0787	0.0127	Yes	(0.0382, 0.1193)
Ibrahim & Aliero (2020)	16	0.1330	0.0077	Yes	(0.1165, 0.1495)
Ibrahim et al. (2019)	10	0.2218	0.0122	Yes	(0.1942, 0.2493)
Katsushi S Imai & Azam (2012)	13	0.0076	0.0062	No	(-0.0060, 0.0212)
Islam (2011)	12	0.0465	0.0079	Yes	(0.0290, 0.0639)
Kaboski & Townsend (2012)	26	0.0063	0.0080	No	(-0.0102, 0.0227)
Kouassi (2008)	4	0.0431	0.0130	Yes	(0.0019, 0.0843)
X. Li et al. (2011)	2	0.1514	0.0937	No	(-1.040, 1.3426)
Nghiem et al. (2012)	3	-0.0108	0.0356	No	(-0.1638, 0.1423)
Swamy (2014)	16	0.3439	0.0315	Yes	(0.2767, 0.4111)
Takahashi et al. (2010)	2	0.0600	0.0094	No	(-0.060, 0.1799)
Total	145	0.0284			

4.3. Financial inclusion on assets

As shown in Table 4.1c, nine (9) studies with a total of 92 estimates examine the relationship between financial inclusion and poverty, in which assets are used as a poverty indicator. The results indicate that only one study (11% of the total number of studies) with two estimates (2.17% of total estimates) present statistically insignificant. Eight out of nine studies (89%) with 90 estimates that examine the effect of financial inclusion on household assets are statistically significant. 76 estimates (82.61% of total estimates) are positive and significant, whereas the remaining 14 estimates (15.22% of total estimates) are negative and significant. Hence, based on the PCCs calculated for each primary study that uses household assets as a measure of poverty, we conclude that, as expected, the impact of financial inclusion on assets is positive. The overall weighted average for all 9 studies is also found to be positive, with a magnitude of 0.0231.

Table 4.1C. Fixed effect weighted means per study on financial inclusion and assets

Paper	No. of estimates	Weighted Mean	Std. Err.	Signif.	Conf. Interval
O Attanasio et al. (2011)	8	-0.0131	0.0024	Yes	(-0.0188, -0.0073)
Cotler & Woodruff (2008)	6	0.0767	0.0085	Yes	(0.0547, 0.0987)
Célerier & Matray (2019)	8	0.0133	0.0014	Yes	(0.0099, 0.0167)
Fomum & Jesse (2017)	20	0.0766	0.0039	Yes	(0.0684, 0.0849)
Garikipati (2008)	2	0.0682	0.0147	No	(-0.1192, 0.2555)
Gertler et al. (2009)	6	0.0246	0.0054	Yes	(0.0106, 0.0386)
Islam (2011)	6	0.0458	0.0050	Yes	(0.0329, 0.0588)
Pitt & Khandker (1998)	30	0.0408	0.0066	Yes	(0.0273, 0.0544)
Takahashi et al. (2010)	6	-0.1097	0.0264	Yes	(-0.1776, -0.0417)
Total	92	0.0231			

This suggests that financial inclusion has a positive effect on household assets. However, the overall weighted averages for explaining the effects of financial inclusion on assets (0.0231) represents a small effect with very little economic significance. Given this small, effect, it is important to note that this may not indicate a genuine measure of the effect of financial inclusion on household assets.

4.4. Financial inclusion and others household level outcomes

In addition to the financial inclusion outcomes presented above (consumption, income and assets), we look into studies that report on other outcomes of financial inclusion. However, we did not find an adequate number of studies that focus on particular household level outcome (variable) to conduct the statistical analysis. Thus, we have pooled together studies that use livelihood/poverty related outcomes such as business creation, financial control, sales, wealth and women empowerment, to examine the impact of financial inclusion. As presented in Table 4.1d, we note that 39 primary studies with 551 estimates report on the association between financial inclusion and various household-level livelihood outcomes. We find that 25 studies (64.1% of the total number of primary studies) with 350 estimates (63.52%) have statistically significant means. The results also indicate that 14 studies (35.9% of the total number of primary studies) with 201 estimates (36.48%) have statistically insignificant means. While the statistically significant weighted means show both positive and negative effects of financial inclusion, the effect of financial inclusion on other household-level outcomes is positive, with a net fixed effect weighted average of 0.0308.

Table 4.1D. Fixed effect weighted means per study on financial inclusion and others household level outcomes

Paper	No. of estimates	Weighted Mean	Std. Err.	Signif.	Conf. Interval
Akanbi (2017)	2	0.1774	0.0069	Yes	(0.0896, 0.2652)
O Attanasio et al. (2011)	48	0.0007	0.0030	No	(-0.0054, 0.0069)
Augsburg et al. (2012)	10	0.0334	0.0163	No	(-0.0035, 0.0703)
Churchill & Marisetty (2020)	6	-0.0206	0.0061	Yes	(-0.0363, -0.0050)
Churchill, Nuhu, & Smyth (2020)	10	-0.0427	0.0121	Yes	(-0.0702, -0.0153)
Banerjee et al. (2009)	3	0.0311	0.0063	Yes	(0.0038, 0.0585)
Berhane & Gardebroek (2011)	8	0.1795	0.0725	Yes	(0.0079, 0.3510)
Cabeza-García et al. (2019)	6	0.2690	0.0663	Yes	(0.0986, 0.4394)
Coleman (1999)	35	-0.0065	0.0083	No	(-0.0234, 0.0103)
Copestake et al. (2001)	2	0.2353	0.0933	No	(-0.9506, 1.4212)
Copestake et al. (2005)	2	-0.0228	0.0231	No	(-0.3161, 0.2705)
Cotler & Woodruff (2008)	3	0.0618	0.0149	No	(-0.0021, 0.1258)
Coulibaly & Yogo (2020)	24	-0.3352	0.0487	Yes	(-0.4359, -0.2344)
Célerier & Matray (2019)	6	0.0126	0.0026	Yes	(0.0059, 0.0194)
Dupas & Robinson (2011)	8	0.0581	0.0104	Yes	(0.0336, 0.0826)
Hazarika & Sarangi (2008)	5	-0.0237	0.0418	No	(-0.1398, 0.0925)
Huang & Zhang (2020)	2	-0.1393	0.0337	No	(-0.5677, 0.2890)
Inoue & Hamori (2013)	6	-0.2756	0.0184	Yes	(-0.3228, -0.2283)
Inoue (2019a)	16	-0.2910	0.0388	Yes	(-0.3738, -0.2083)

Paper	No. of estimates	Weighted Mean	Std. Err.	Signif.	Conf. Interval
Iqbal, Roy, & Alam (2020)	24	-0.1227	0.0165	Yes	(-0.1569, -0.0885)
Islam & Choe (2013)	18	-0.0323	0.0033	Yes	(-0.0393, -0.0253)
Kaboski & Townsend (2012)	5	0.0175	0.0048	Yes	(0.0041, 0.0310)
Kapingura (2017)	4	-0.2579	0.0776	Yes	(-0.5048, -0.0110)
Kevane & Wydick (2001)	24	0.1132	0.0124	Yes	(0.0875, 0.1388)
Kim (2016)	10	-0.1052	0.0375	Yes	(-0.1900, -0.0205)
Laha & Kuri (2014)	3	0.0358	0.0420	No	(-0.1450, 0.2166)
X. Li et al. (2011)	73	0.1316	0.0136	Yes	(0.1045, 0.1588)
McKernan (2002)	46	0.0589	0.0092	Yes	(0.0404, 0.0774)
Montgomery (2005)	8	0.0093	0.0129	No	(-0.0212, 0.0398)
Ndlovu & Toerien (2020)	7	0.1417	0.0212	Yes	(0.0899, 0.1935)
Neaime & Gaysset (2018)	6	0.1880	0.0614	Yes	(0.0301, 0.3460)
Omar & Inaba (2020)	12	-0.0764	0.0197	Yes	(-0.1196, -0.0331)
C.-Y. Park & J. R. Mercado (2018)	10	-0.1384	0.0340	Yes	(-0.2153, -0.0615)
Pitt & Khandker (1998)	53	-0.0021	0.0056	No	(-0.0134, 0.0092)
Sharma (2016a)	6	0.8492	0.1053	Yes	(0.5787, 1.1198)
Shimamura & Lastarria-Cornhiel (2010)	16	-0.0201	0.0183	No	(-0.0591, 0.0190)
Takahashi et al. (2010)	12	0.0373	0.0278	No	(-0.0240, 0.0985)
Raza, Tang, Rubab, & Wen (2019)	2	-0.0797	0.6907	No	(-8.8552, 8.6959)
Turegano & Herrero (2018)	10	0.2580	0.0483	Yes	(0.1487, 0.3673)
Total	551	0.0308			

In summary, the existing empirical studies investigate the relationship between financial inclusion on household livelihood related outcomes in various countries suggests that the effect of financial inclusion on household level outcomes are positive, although there are considerable issues concerning both selection bias and the heterogeneity of measurements and household outcomes in the selected studies. The fixed effect weighted average estimates reported by each study indicates a similar degree of heterogeneity and have a positive sign. While the meta-analysis findings for the effect of financial inclusion on consumption and household assets indicate small but consistently positive effects, the findings for income and other livelihood outcomes of financial inclusion show positive but inconsistent effects. The overall meta-analysis findings for household livelihood outcomes appear to be generally positive, but these are impacted by concerning issues related to the conceptualization and measurement of major variables. The meta-analysis results for other household livelihood outcomes such as health status, education and women empowerment are insignificant or non-existent, and very limited evidence is available for meaningful meta-analysis study for livelihood related outcomes across the studies we reviewed.

One of the interesting observations we draw from the analysis is that despite the data sample being from single country or mixed countries, the various measures of financial inclusion tend to have a positive association with various measures of household livelihood outcomes. We also observe that most of the studies we reviewed and weighted estimates reported in these studies tend to examine financial inclusion on various aspects of livelihood or household welfare; however, based on our analysis, consumption, income and assets are found to be important in the meta-analysis considering the larger number of estimates.

5. Discussion

The evidence synthesized in this meta study indicates that the outcomes of financial inclusion reflect small positive and statistically significant effects on household livelihoods and other poverty related factors. This finding is based on a comprehensive set of empirical studies that have been identified from a systematic search of the literature as set out in the selection protocol. Although our results do not indicate the impact of financial inclusion on livelihood related outcomes as significant and “transformative” as expected by policy makers (Demirguc-Kunt et al., 2017; Martin & Hill, 2015), they are consistent with the general understanding of the impacts of financial inclusion. Thus, we confirm the potential positive outcomes of investing financial inclusion in terms of enhanced household livelihood and reducing poverty that are broadly accepted by academics, policymakers and practitioners who work in the field of social and economic development policies and which have provided a rationale for many of the Millennium Development Goals targeting improvement in the developing world.

While this general consensus has facilitated a path for researchers to build a large body of policy-oriented research, we note that the growing literature on the impact of financial inclusion is exceptionally diverse in terms of methodology, measurement and country groupings. As a result of this high fragmentation of research, we paid special attention to the synthesis of the empirical evidence on the financial inclusion conducted in various contexts. Thus, rather than grouping and aggregating the estimates of all studies that use different measures of financial inclusion and livelihood outcomes, we controlled for difference in data sources by calculating fixed effect estimates (FEEs) and coefficients of variation for each primary study, and we group studies based on similarities on outcomes to accurately report for net fixed effect weighted average. This analysis provides verifiable evidence on the outcomes of financial inclusion in wider sets of countries. As discussed in the

methods section, in such meta-analysis, the FEEs can give sufficient information on ‘effect size’ if between-study heterogeneity is limited through study design and arbitrary selection of intervention and control groups.

We advise, thus, interpreting some of these findings with caution for four reasons, which we believe warrant further research. First, the penetration of bank accounts, bank branches and ATMs represent a measure of access to financial services, rather than use of financial services. Second, some studies engage in the practice of p-hacking, in which they focus discussion on, and draw policy recommendations based on the measure of financial inclusion associated with the lowest p-value. Third, studies of cross-sectional and panel data sets need to better address endogeneity concerns, notably that financial inclusion might contribute to poverty alleviation and other livelihood outcomes. Fourth, a number of these studies conflate financial inclusion with financial development, by investigating the link between the size of the finance sector, penetration of bank branches and ATMs, and poverty alleviation.

No systematic review using meta-analysis is better than the body of empirical research on which it is based. The increased quality of the available data sources in terms of measuring the main financial inclusion and livelihood variables considered here, as well as the increase in computer power over the past decade, has led to an increase in the amount of empirical work in this area, as well as to an improvement in the quality of this work. In many of the recent papers focusing on the use of panel data and GMM estimation methods, the increase in quality is evident with respect to: (i) estimation methodology that monitors endogeneity (or reverse causality) between financial inclusion and economic and livelihood changes in countries, and (ii) the measurement of financial inclusion and livelihood outcomes to include test scores and measures of financial inclusion level which have previously been

unavailable on large-scale cross-country datasets. However, despite such positive aspects, the current literature presents some significant difficulties for meta-analysis and represents some idiosyncrasies that render it difficult to synthesize proof. The experimental and observational nature of studies and the possibility of sample dependency between studies or between different samples used in the same study may provide challenges to conduct a meta-analysis of existing empirical evidence in the literature (Demirguc-Kunt et al., 2017; Fernández-Olit et al., 2019). Further, given the literature on financial inclusion is still in its infancy, researchers investigating the relationship between financial inclusion and household livelihood outcomes, use financial inclusion and livelihood measures that are not consistent with or build on previous studies. Therefore, samples used in empirical studies may not be independent or random.

While the results of this meta-analysis show that the effects of financial inclusion indicators are more likely to be positive than negative, we note that the evidence used in majority of the reviewed studies is from the early-stage causal effect. This has implications when attempting to establish evidence on the wide-ranging or transformative impacts of financial inclusion. The estimated weighted effects we found for the livelihood outcomes of financial inclusion such as incomes or assets are very small and not consistent across study samples or types of interventions. One promising aspect we discovered, however, relates to access to bank and micro credits opportunities. Although the estimated effects are small, we found that they are more consistently positive than the other effects. This result mirrors the argument that access to financial credit may be the most important aspect of financial inclusion for poor and low-income people (Cotler & Woodruff, 2008; Mader, 2016).

Policy Implication

The findings of the study show that increased access to financial services can have poverty-alleviating effects and contribute to empower financially excluded households. However, access to financial services including credit, savings, insurance and money transfers services provided by financial institutions may not be enough to enhance poor households' welfare, to grasp opportunities, and ultimately escape poverty. As such it is important to integrate policy initiatives that facilitate behavioral and attitude changes such as household business practice and spending decisions in order to achieve the desired outcomes of access to financial services. The policy and other stakeholders will benefit from a more open and clear-sighted demand of financial inclusion and complement the supply side of financial inclusion initiatives.

In addition to the impact on the livelihood of households, our findings indicate that financial inclusion efforts could also have direct effect on macroeconomic development and growth, from which poor and low-income people in turn would benefit. Hence, alternatives macro level livelihood-enhancement programs with a focus on livelihood security and income generation may help to deliver more comprehensive and context-specific forms of financial inclusion services. For policy and practice, therefore, we suggest to focus on designing and implementing financial inclusion programs that facilitate access to savings opportunities that contribute to the macro level financial welling.

We believe that the results of this review are useful to evidence-based policymaking to encourage financial inclusion efforts by national governments, international organizations and international assistance donors. This meta-analysis may also promote evidence-based policies in relation to policy interventions informed by the Millennium Development Goals which emphasis on livelihoods of households across countries. The evidence provided in this

analysis suggests that there is a case for engaging in the promotion of financial inclusion to improve household livelihoods.

6. Conclusions

This meta-analysis study looks into the empirical evidence on impact of financial inclusion on household livelihood indicators. As such, we contribute to the body of literature on financial inclusion by (i) providing a meta-synthesis of the existing empirical evidence on the financial inclusion and household level outcomes, (ii) suggesting further research avenues for scholars to address and further advance the knowledge in the field, and (iii) pointing to policy implications of the synthesized evidence.

The empirics we synthesize in this review indicates that financial inclusion, regardless of the inconsistency, has a statistically significant positive effects on household livelihood outcomes. There is a prima facie case for policy interventions aimed at promoting and enhancing the level of financial inclusion both developing and emerging economies. Therefore, efforts by national and trans-national organizations to promote financial inclusion are likely to be rewarded by enhanced livelihoods and poverty reduction, particularly in developing countries. The results also suggest, however, that the small effects observed are likely to be subject to the use of financial inclusion proxies, and more effective household livelihoods and poverty-related measures can contribute to the discovery of greater effects. The lack of focused and consistent measures of financial inclusion and its effect of household livelihoods means that it is difficult to find high level support for promoting financial inclusion and to recommend for more policy intervention. However, it is obvious that the current measures of financial inclusion are not really accurate measures of the intervention, rather instruments of the credit or saving provision within countries. Therefore, one of the limitations of this study is that while the findings of this meta-analysis conclude that financial

inclusion has a positive effect on the livelihoods related outcomes, the scale of this impact may not necessarily be precise.

We believe that an additional avenue for further research is to better understand the role of informal lending in the context of field experiments and RCTs, particularly the role of cultural barriers to formal saving and lending behavior, and how social networks contribute to informal lending and change household livelihood outcomes.

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Appendix 1: List of Studies Included in Meta-Analysis

#	Author(s) (Year)	Country	Data Type	Unit of Analysis	No. observations	Dependent variable	Intervention measures	Method of analysis
1	Abor et al. (2018)	Ghana	Cross- Section	Household	16,772	<ul style="list-style-type: none"> • Non-poor-dummy 	<ul style="list-style-type: none"> • Bank access • Credit access • Insurance access 	SURE_probit OLS 2SLS
2	Abou-Ali et al. (2009)	Egypt	Cross- Section	Households	2961	<ul style="list-style-type: none"> • Income • Expenditure • Poverty gap • Poverty index 	<ul style="list-style-type: none"> • Micro-credit 	PSM
3	Terfa W Abraham (2018)	Nigeria	Cross- Section	Household	320	<ul style="list-style-type: none"> • Income 	<ul style="list-style-type: none"> • Savings • Credit access 	ordered_logit
4	Akabi (2017)	Mixed	Panel	Country	437	<ul style="list-style-type: none"> • GDP per capita 	<ul style="list-style-type: none"> • Domestic credit 	2SLS
5	Alam (2012)	Bangladesh	Cross- Section	Household	2873	<ul style="list-style-type: none"> • Expenditure 	<ul style="list-style-type: none"> • Loan 	OLS IV
6	Ashraf et al. (2010)	Philippines	Experimental	Household	1181	<ul style="list-style-type: none"> • Expenditure 	<ul style="list-style-type: none"> • Access to savings 	probit

#	Author(s) (Year)	Country	Data Type	Unit of Analysis	No. observations	Dependent variable	Intervention measures	Method of analysis
7	Orazio Attanasio, Augsburg, De Haas, Fitzsimons, & Harmgart (2014)	Mongolia	Experimental		2055	<ul style="list-style-type: none"> • Consumption • Business creation • Labour supply • Profits • Income • Assets 	<ul style="list-style-type: none"> • Access to credit 	DID
8	Augsburg et al. (2012)	Bosnia	Cross- Section	Household	637	<ul style="list-style-type: none"> • Business owner • Profits • Revenue • Consumption • Labour supply 	<ul style="list-style-type: none"> • Micro-credit 	OLS
9	Banerjee, Duflo, Glennester, & Kinnan (2015)	India	Panel		6821	<ul style="list-style-type: none"> • Expenditure • Business creation • Profits 	<ul style="list-style-type: none"> • Access to credit 	ITT
10	Berhane & Gardebroek (2011)	Ethiopia	Panel	Household	351	<ul style="list-style-type: none"> • Consumption • Housing improve 	<ul style="list-style-type: none"> • Access to credit 	OLS logit Panel FE
11	Brune et al. (2011)	Malawi	Cross- Section		2835	<ul style="list-style-type: none"> • Expenditure 	<ul style="list-style-type: none"> • Micro-savings 	OLS
12	Cabeza-García et al. (2019)	Mixed	Cross- Section	Country	91	<ul style="list-style-type: none"> • GDP per capita 	<ul style="list-style-type: none"> • Bank access 	OLS

#	Author(s) (Year)	Country	Data Type	Unit of Analysis	No. observations	Dependent variable	Intervention measures	Method of analysis
13	Célerier & Matray (2019)	US	Cross- Section	Household	63745	<ul style="list-style-type: none"> • Wealth • Net worth • Assets 	<ul style="list-style-type: none"> • Bank access 	2SLS
14	Churchill & Marisetty (2020)	India	Cross- Section	Household	44705	<ul style="list-style-type: none"> • PPI score • Deprivation score • Nonpoor - dummy 	<ul style="list-style-type: none"> • Financial inclusion index • Bank access • Credit access • Insurance access 	OLS
15	Churchill et al. (2020)	Nigeria	Cross- Section	Household	4555	<ul style="list-style-type: none"> • PPI score • Deprivation score • Nonpoor - dummy 	<ul style="list-style-type: none"> • Financial inclusion index • Bank access • Credit access • Insurance access 	OLS 2SLS
16	Coleman (1999)	Thailand	Cross- Section	Household	277	<ul style="list-style-type: none"> • Household outcomes 	<ul style="list-style-type: none"> • Micro-savings • Loan 	PanelFE PanelRE Naïve
17	Copestake (2002)	Zambia	Cross- Section	Household	397	<ul style="list-style-type: none"> • Income growth 	<ul style="list-style-type: none"> • Loan 	OLS
18	Copestake et al. (2001)	Zambia	Cross- Section	Household	283	<ul style="list-style-type: none"> • Profits • Income growth 	<ul style="list-style-type: none"> • Loan 	OLS

#	Author(s) (Year)	Country	Data Type	Unit of Analysis	No. observations	Dependent variable	Intervention measures	Method of analysis
19	Copestake et al. (2005)	Peru	Cross- Section	Household	935	<ul style="list-style-type: none"> • Income • Change in income • Sales • Profits 	<ul style="list-style-type: none"> • Loan 	DID
20	Cotler & Woodruff (2008)	Mexico	Panel	Household	987	<ul style="list-style-type: none"> • Profits • Assets • Income 	<ul style="list-style-type: none"> • Micro-credit 	OLS
21	Coulibaly and Yogo (2020)	Mixed	Panel	Country	318	<ul style="list-style-type: none"> • Share of poor 	<ul style="list-style-type: none"> • Bank branches 	FE 2SLS OLS GMM
22	Cuong (2008)	Vietnam			6427	<ul style="list-style-type: none"> • Expenditure • Income • Poverty index 	<ul style="list-style-type: none"> • Micro-credit • Access to credit 	IV
23	Dupas and Robinson (2011)	Kenya			241	<ul style="list-style-type: none"> • Income • Revenue • Labour supply • Expenditure 	<ul style="list-style-type: none"> • Micro-savings 	IV
24	Fomum and Jesse (2017)	South Africa	Cross- Section	Household	3900	<ul style="list-style-type: none"> • Assets 	<ul style="list-style-type: none"> • Savings • Insurance access 	OLS

#	Author(s) (Year)	Country	Data Type	Unit of Analysis	No. observations	Dependent variable	Intervention measures	Method of analysis
25	Garikipati (2008)	India			112	<ul style="list-style-type: none"> Assets 	<ul style="list-style-type: none"> Access to credit 	logit
26	Gertler et al (2009)	Indonesia			3281	<ul style="list-style-type: none"> Assets Consumption 	<ul style="list-style-type: none"> Access to credit 	OLS
27	Hazarika and Sarangi (2008)	Malawi		Household	410	<ul style="list-style-type: none"> Enrolled sch 	<ul style="list-style-type: none"> Loan 	probit
28	Hoque (2004)	Bangladesh			216	<ul style="list-style-type: none"> Consumption 	<ul style="list-style-type: none"> Access to credit Micro-savings 	OLS
29	Huang and Zhang (2020)	China	Panel	Province	870	<ul style="list-style-type: none"> Inequality 	<ul style="list-style-type: none"> Financial inclusion index 	dyna_FE
30	Ibrahim and Aliero (2020)	Nigeria	Cross- Section	Household	1253	<ul style="list-style-type: none"> Income per capita 	<ul style="list-style-type: none"> Financial inclusion index _dummy 	OLS
31	Ibrahim et al 2019	Nigeria	Cross- Section	Household	483	<ul style="list-style-type: none"> Consumption expenditure 	<ul style="list-style-type: none"> Financial inclusion index 	OLS
32	Imai and Azam (2012)	Bangladesh			10388	<ul style="list-style-type: none"> Income Consumption 	<ul style="list-style-type: none"> Micro-credit 	PanelFE
33	Imai et al (2010)	India			3718	<ul style="list-style-type: none"> Poverty index 	<ul style="list-style-type: none"> Micro-credit 	tobit

#	Author(s) (Year)	Country	Data Type	Unit of Analysis	No. observations	Dependent variable	Intervention measures	Method of analysis
34	Imai et al 2012	Mixed	Panel	Country	99	<ul style="list-style-type: none"> Poverty gap 	<ul style="list-style-type: none"> MFI gross loan per capita 	OLS FE RE
35	Inoue (2013)	Mixed	Panel	Country	87	<ul style="list-style-type: none"> Poverty ratio 	<ul style="list-style-type: none"> MFI intensity Borrowers pop Gross loan per capita 	GMM
36	Inoue (2019)	India	Panel	States	114	<ul style="list-style-type: none"> Poverty ratio 	<ul style="list-style-type: none"> Bank branches 	GMM
37	Iqbal et al 2020	Bangladesh	Panel	Subdistrict	380	<ul style="list-style-type: none"> Poverty rates 	<ul style="list-style-type: none"> Bank branches Bank accounts Deposits pe population Credit per population 	FE
38	Islam (2009)	Bangladesh			3026	<ul style="list-style-type: none"> Consumption 	<ul style="list-style-type: none"> Micro-credit 	IV
39	Islam (2011)	Bangladesh			2694	<ul style="list-style-type: none"> Expenditure Income Assets Consumption 	<ul style="list-style-type: none"> Access to credit 	DID
40	Islam and Choe (2013)	Bangladesh		Household	4277	<ul style="list-style-type: none"> Enrolled school 	<ul style="list-style-type: none"> Access to credit 	IV

#	Author(s) (Year)	Country	Data Type	Unit of Analysis	No. observations	Dependent variable	Intervention measures	Method of analysis
41	Kaboski and Townsend (2012)	Thailand			5831	<ul style="list-style-type: none"> • Consumption • Profits • Income • Revenue 	<ul style="list-style-type: none"> • Micro-credit 	OLS IV
42	Kapingura (2017)	South Africa	Timeseries	Country	23	<ul style="list-style-type: none"> • Gini 	<ul style="list-style-type: none"> • Bank credit • ATM numbers 	dyna_FE
43	Kevane and Wydick (2001)	Guatemala			342	<ul style="list-style-type: none"> • Sales • No of employees 	<ul style="list-style-type: none"> • Access to credit 	OLS tobit
44	Kim (2016)	Mixed	Panel	Country	318	<ul style="list-style-type: none"> • Gini 	<ul style="list-style-type: none"> • Financial inclusion Index 	OLS GMM
45	Koomson et al 2020	Ghana	Cross- Section	Household	13805	<ul style="list-style-type: none"> • Poverty-dummy 	<ul style="list-style-type: none"> • Financial inclusion Index • Mobile money account • Bank access • Insurance access • Credit access 	Probit IV
46	Kouassi (2008)	Timor, Peru & South Africa			12743	<ul style="list-style-type: none"> • Income 	<ul style="list-style-type: none"> • Micro-credit 	OLS

#	Author(s) (Year)	Country	Data Type	Unit of Analysis	No. observations	Dependent variable	Intervention measures	Method of analysis
47	Laha et al 2014	Mixed	Panel	Microfinance Banks	3652	<ul style="list-style-type: none"> • Women employment 	<ul style="list-style-type: none"> • Microfinance penetration • Microcredit availability • Microfinance usage 	OLS
48	Li (2018)	China	Cross- Section	Household	867	<ul style="list-style-type: none"> • Consumption expenditure 	<ul style="list-style-type: none"> • Credit access 	OLS
49	Li et al (2011)	China		Household	848	<ul style="list-style-type: none"> • Income • Consumption 	<ul style="list-style-type: none"> • Microcredit • Access to credit 	DID
50	Li, Gan and Hu (2011)	China		Household	92	<ul style="list-style-type: none"> • Finance control • Mobility • Decision making • Awareness 	<ul style="list-style-type: none"> • Micro-credit 	logit
51	Mckernan (2002)	Bangladesh			1558	<ul style="list-style-type: none"> • Profits 	<ul style="list-style-type: none"> • Access to credit 	Tobit Maximum Likelihood
52	Montgomery (2005)	Pakistan		Household	2881	<ul style="list-style-type: none"> • Enrolled school • Absent from school 	<ul style="list-style-type: none"> • Access to credit 	Logit OLS

#	Author(s) (Year)	Country	Data Type	Unit of Analysis	No. observations	Dependent variable	Intervention measures	Method of analysis
53	Ndlovu and Toerien (2020)	Mixed	Cross- Section	Household	56800	<ul style="list-style-type: none"> • Wealth index 	<ul style="list-style-type: none"> • Access to finance 	OLS IV
54	Neaime and Gaysset (2018)	Mixed	Panel	Country	112	<ul style="list-style-type: none"> • Gini • Poverty growth rate 	<ul style="list-style-type: none"> • ATM numbers • Number of banks 	OLS GMM
55	Nghiem et al (2012)	Vietnam			471	<ul style="list-style-type: none"> • Income • Consumption 	<ul style="list-style-type: none"> • Access to credit 	OLS
56	Omar and Inaba (2020)	Mixed	Panel	Country	385	<ul style="list-style-type: none"> • Poverty head count • Gini 	<ul style="list-style-type: none"> • Financial inclusion index 	FE
57	Park and Mercado (2018)	Mixed	Cross- Section	Country	154	<ul style="list-style-type: none"> • Poverty head count • Gini 	<ul style="list-style-type: none"> • Financial inclusion index 	OLS
58	Pit and Khandker (1998)	Bangladesh			4567	<ul style="list-style-type: none"> • Expenditure • Assets • Labor supply 	<ul style="list-style-type: none"> • Micro-credit 	OLS Maximum Likelihood tobit
59	Sehrawat and Giri (2016a)	Mixed	Panel	Country	253	<ul style="list-style-type: none"> • Consumption expenditure 	<ul style="list-style-type: none"> • Domestic credit 	FMOLS
60	Sehrawat and Giri (2016b)	India	Timeseries	Country	43	<ul style="list-style-type: none"> • Consumption expenditure 	<ul style="list-style-type: none"> • Domestic credit 	ARDL

#	Author(s) (Year)	Country	Data Type	Unit of Analysis	No. observations	Dependent variable	Intervention measures	Method of analysis
61	Sharma (2016)	India	Timeseries	Country	10	<ul style="list-style-type: none"> • GDP per capita 	<ul style="list-style-type: none"> • Bank penetration • Number of deposit account • Number of loan account 	VECM
62	Shimamura and Cornhiel (2010)	Malawi		Household	708	<ul style="list-style-type: none"> • Enrolled sch 	<ul style="list-style-type: none"> • Access to credit 	OLS IV tobit
63	Swamy (2014)	India	Panel	Individual	450	<ul style="list-style-type: none"> • Income 	<ul style="list-style-type: none"> • Participation FI program 	OLS GMM
64	Takahashi et al (2010)	Indonesia			100	<ul style="list-style-type: none"> • Income • Profits • Sales • Assets • Expenditure 	<ul style="list-style-type: none"> • Micro-credit 	OLS
65	Raza et al. (2019)	Pakistan	Timeseries	Country	6	<ul style="list-style-type: none"> • Hdi 	<ul style="list-style-type: none"> • ATM numbers • Bank branches 	OLS
66	Turegano and Herrero (2018)	Mixed	Cross-Section	Country	172	<ul style="list-style-type: none"> • Gini 	<ul style="list-style-type: none"> • Credit to private sec 	OLS

#	Author(s) (Year)	Country	Data Type	Unit of Analysis	No. observations	Dependent variable	Intervention measures	Method of analysis
67	Wang and He (2020)	China	Cross- Section	Household	1900	<ul style="list-style-type: none"> Poverty line dummy 	<ul style="list-style-type: none"> Use of digital finance 	OLS 2SLS