# **PROJECT TITLE:**

# **Capital Inflows and Growth in Developing Countries:**

# **Do Capital Inflows Affect Capital Goods Imports?**

# **PROJECT DESCRIPTION**

## **Introduction**

**A.1. Rationale**

There is an ongoing debate among researchers and policy makers about how international financial integration affects the growth of developing countries receiving new resources. Financial integration can certainly enable countries to finance productive investment using external funds and to import foreign technology, thus boosting economic growth. As a result, many developing countries have become motivated to offer incentives, such as tax exemptions, to attract more foreign funds. However, in countries suffering from weak institutions and poor investment environments, capital inflows can potentially amplify resource misallocation and increase the probability of financial crises, thus reducing growth (Alfaro and Hammel, 2007). Available empirical studies paint a complex, mixed picture regarding the effects of international financial integration (for an overview, see e.g., Contessi and Weinberger, 2009 and Prasad et al., 2003). Given the lack of consensus regarding the direct impact of financial integration on growth, recent studies have focused on the channels through which capital inflows affect growth, such as improvements in total factor productivity (TFP) or increases in capital allocation efficiency (Bekaert et al, 2011; Bonfigliol, 2008). The presence of such indirect channels could explain the mixed evidence on the direct effect.

The mixed results found in the literature could also be attributed to the fact that most studies use very heterogeneous samples, usually comprising both industrialized and less developed economies. This could diminish the estimated growth effects of capital inflows because positive effects are more likely to be observed among developing countries. These economies have more volatile output growth than their advanced counterparts, and thus are in a better position to gain more from international risk sharing. Additionally, developing countries are relatively capital scarce and labor rich, so they benefit more from improved access to capital (Kose et al., 2011). Thus, examining developing countries separately from their developed counterparts may better enhance our knowledge about the impact of capital inflows.

The current project aims to contribute to this debate on the growth contribution of capital inflows by exploring one of the channels through which capital inflows affect growth, in an analysis comprising only developing countries. Specifically, we investigate whether cross-border capital inflows lead to more imports of capital goods by the manufacturing sector, as this sector is particularly dependent on external financing and imports more capital goods than do other economic sectors. The reason for this focus is that the production of capital goods is concentrated in a few R&D-intensive countries, with about 80% of the world’s capital goods produced by only 10 advanced countries (Mutreja et al., 2018), from which other countries import most of their capital. Thus, rather than study broad correlations between capital inflows and economic growth, we examine a specific microeconomic channel through which capital inflows can accelerate economic growth. If capital inflows facilitate the imports of capital goods by providing additional and competitive financial resources, then this effect should be more pronounced in sectors that are technologically more dependent on external sources of financing.

Firms in developing countries can enhance their long-term performance and growth by acquiring productivity-enhancing technology (Fauceglia, 2014). By improving the quality of capital stocks, imports of capital goods can boost total factor productivity (TFP), thus enhancing economic growth. Moreover, modern machinery and equipment that utilize cost-effective technologies can then become sources of innovation in less developed countries (Bas and Berthou, 2012). Thus, foreign capital goods can affect economic growth in developing countries in at least two ways. First, by importing more capital goods from industrialized countries, developing countries improve their TFP by allocating their resources more efficiently. Second, access to foreign capital goods reduces the relative price of investment in such countries and thus increases their investment rate and capital productivity.

Still, credit constraints in developing countries can prevent firms from upgrading their capital stock (Fauceglia, 2014; 2015). The questions arises as to whether foreign capital inflows mitigate this obstacle. The literature shows that capital inflows can increase imports of capital goods for several reasons (Alfaro and Hammel, 2007). First, by augmenting financial resources, capital inflows improve the domestic firms’ access to international financial markets for importing capital goods. Second, capital inflows increase liquidity and facilitate risk diversification. This reduces the cost of capital, which should enable firms to import more machinery and equipment and improve their investment in productive projects. Third, capital inflows play an important role in transmitting technological advances and facilitating knowledge spillover across borders. We posit that these three effects are more signficant for finance dependent industries in developing countries. For example, Leblebicioğlu and Madariaga (2015) show that the effect of financial inflows on the quality of capital stocks is stronger in developing countries, as their production of capital goods is relatively small, thus requiring them to import most capital goods from advanced economies. In addition, financial markets are not well developed in these countries, with domestic financial resources both scarce and expensive. Consquently, we posit that financially dependent industries in developing counties benefit disproportionately more from the inflows of foreign capital by importing more capital goods.

However, not all forms of capital inflows into developing countries may facilitate imports of capital goods and foster growth. For example, recent studies find that capital inflows show a great degree of heterogeneity across borrower types (Avdjiev et al., 2018; Cerutti et al., 2015). A large share of inflows, particularly debt, may ultimately wind up in the financial sector, which is not necessarily the best channel for increasing foreign capital goods in the manufacturing sector. This is especially the case when finance companies recycle a significant amount of foreign capital. This suggets that when considering the real effect of capital inflows, one must distinguish between inflows to the financial sector and inflows to the corporate sector and accordingly examine the impact of each type on capital goods imports.

To quantify the effect of capital inflows on imports of capital goods, this project intends to use a panel data for manufacturing sectors in a large number of developing countries over the period 1990–2017. Due to disruptions in world financial integration during the recent global financial crisis, we differentiate between the pre-crisis period up to 2007 and the subsequent crisis period. To identify the causal effects of capital inflows on the quality of investment (i.e., more imports of capital goods), our empirical approach is to test whether sectors that regularly use external sources of financing because of inadequate internal cash flows import more capital goods if these sectors are located in countries enjoying significant levels of capital inflows. That is, if capital inflows influence access to financing for domestic corporations and hence imports of capital goods, then we would expect these inflows to have a larger effect on industries that are financially more dependent on external financing. This hypothesis follows the commonly-used approach of Rajan and Zingales (1998), who study the effect of financing on growth by examining whether financially dependent industries in countries with deeper financial sectors grow faster. To overcome the common issue of the identification problem that usually persists in cross-country regressions, Rajan and Zingales propose a novel specification by introducing the interaction between a country characteristic (financial development) and an industry characteristic (external financial dependence). This project follows a similar empirical approach by interacting between a proxy for a country’s capital inflows and a proxy for the sector’s reliance on external financing. The outcome variable is the relative imports of capital goods.

This project contributes to the field in a number of ways. First, we examine one specific channel, imports of capital goods, through which capital inflows affect economic development. Second, we focus only on developing countries where imports of advanced technology found in machinery and equipment can improve the quality of their capital stocks and thus enhance growth. Third, we consider only the manufacturing sector because it produces tradable goods that need more external funds. In addition, capital goods are usually the major component of the assets in manufacturing firms, for which the bulk of financing is raised from external sources of funds. Thus, industrial data offer a more accurate view of the potential effects of foreign capital inflows on growth. Fourth, we investigate the growth effects of different types of capital inflows. Rather than considering only aggregate capital inflows, we examine whether breaking down capital inflows by instrument and, more importantly, by borrower type, leads to different effects of capital inflows on imports of capital goods. Finally, we contribute to the existing literature by arguing that capital inflows may affect growth differently as a result of various aspects of a country’s absorptive capacity. A number of domestic factors, such as the performance of the financial sector and institutional arrangements, can arguably determine an economy’s capacity to transform foreign capital into domestic investment and growth. For example, Leblebicioğlu and Madariaga (2015) find that the growth effect of financial inflows through capital goods is more significant in countries with more developed financial sectors.

The findings of this study will help determine which financial globalization policies encourage the adoption of foreign technologies that could support strategies for development in less developed countries and what forms their effects take. Capital inflows play an important role here, as they are associated with incentives to modernize industrial sectors by enabling the purchase of the most sophisticated machinery and encouraging efficient knowledge utilization. For example, by decreasing borrowing costs, capital mobility encourages firms to launch new investment projects, previously not profitable before the inflow of foreign funds, but profitable once such funds are available (Alfaro and Hammel, 2007). Furthermore, the findings could offer lessons on relaxing barriers on cross-border trade. International trade can disseminate the benefits of technological advances across countries through capital goods imports. This project would show how capital inflows can strengthen this channel in developing countries by reducing credit constraints. Our findings can potentially inform policy making on questions relating to liberalizing capital flows and international trade in less developed countries.

**A.2. Preliminary Literature Review**

Foreign capital supplements insufficient domestic savings in financially deficient economies and, by lowering the cost of borrowing, allows investment to increase. For example, equity market liberalizations that encourage capital inflows give firms in emerging economies access to new financing sources and decrease the cost of borrowing, thereby enhancing investment opportunities (Bekaert et al., 2005; Gupta and Yuan, 2009). Thus, capital inflows are expected to improve economic performance in recipient countries. However, the results of empirical studies on the direct link between capital inflows and growth do not lead to the same conclusion (Aizenman et al., 2013). Accordingly, some researchers focus on the channels through which capital inflows may affect growth.

Capital inflows can affect growth in host countries through capital accumulation and TFP. Capital inflows enhance productivity growth by transferring technology and managerial techniques. Foreign capital inflows spur the development of the recipient country’s financial sector, which increases the liquidity and the efficiency of capital allocation. Additionally, new financial techniques and practices introduced by foreign capital can be applied in the domestic financial markets of developing countries. Capital inflows can also impose discipline on macroeconomic policies of recipient countries, leading to more stable policies, improvements in institutions, and better governance. These so-called “collateral benefits” of foreign capital inflows could result in a high level of growth, especially via gains in allocation efficiency and TFP (Kose et al., 2009a). Using *de jure* measures of capital inflows, Bonfiglioli (2008) find a positive association between financial openness and TFP. Similarly, Bekaert et al. (2011) report a positive effect of capital inflows on both TFP and capital accumulation. Using *de facto* measures, Kose et al. (2009a) also demonstrate that equity inflows positively affect TFP growth.

There is also a link between the quality of capital goods and TFP, whereby the former positively affects the latter (Caselli and Wilson, 2004). This indicates that capital goods can be a mechanism by which capital inflows affect TFP and consequently growth. Despite the importance of this channel, only two studies have investigated the impact of financial globalization on the quality of capital goods. [Alfaro and Hammel (2007)](https://www.sciencedirect.com/science/article/pii/S0022199617300260%22%20%5Cl%20%22bb0020) find that countries that liberalize their capital markets gain the economic benefits of acquiring advanced technology transferred from imported capital goods, which tends to have a positive effect on economic growth. The growth-boosting relationship between international financial inflows, capital goods and economic growth is also emphasized by [Leblebicioğlu and Madariaga (2015)](https://www.sciencedirect.com/science/article/pii/S016726811830372X%22%20%5Cl%20%22bib0054), who find evidence of the positive effect of international financial integration on growth through the capital stock quality. The above two studies build on the observation by Eaton and Kortum (2001) that only a few countries produce and export capital goods and the remaining countries in the world are users and importers of such goods.

Imports of capital goods are critical for economic progress in developing countries. The role of trade in capital goods in economic growth and related outcomes has been documented by a growing body of literature (Burstein et al., 2013; Parro, 2013; Raveh and Reshef, 2016). Trade in capital goods allows developing countries to benefit from efficient technologies that reduce relative prices of capital goods and increase productivity. By importing more foreign capital goods, less developed countries can also use their comparative advantage and enhance their capital allocation efficiency and TFP, which are essential for economic growth. Some studies indeed find evidence of the growth-enhancing effect of foreign capital goods (Busse and Groizard, 2008; Caselli and Wilson, 2004; Eaton and Kortum, 2001; Herrerias and Orts, 2010; 2013; Lee, 1995; Mazumdar, 2001; Mutreja et al, 2018). These findings suggest that in those developing countries that need to import most of their machinery and equipment, economic growth relies on the countries’ capacity to import more capital goods.

However, firms require a substantial amount of financial resources in order to import needed capital goods. A new area of research shows how credit constraints reduce firms’ imports of capital goods in developing countries. Tybout (2000) claims that firms in less developed, credit-constrained countries can import capital goods from advanced economies only at an extra cost. Firms that invest in sophisticated production technologies therefore need a substantial amount of external financing. This suggests that firms with limited domestic financial resources cannot upgrade technologies. Bas and Berthou (2011) find that Indian firms with poor liquidity are less likely to import capital goods. Similarly, Bas and Berthou (2012) show that firms with a high level of liquidity and/or a low level of leverage import more capital goods. Fauceglia (2014) finds that credit-constrained firms in developing countries do not invest in capital goods. Fauceglia (2015) also finds that lack of access to financing in developing countries has an adverse impact on firms’ capital goods imports, especially where institutions are weak. However, these studies do not determine whether foreign capital can mitigate the adverse impact of credit constraints on capital goods imports.

Our project can be distinguished from the above studies in three respects. First, we use *de facto* measures of capital inflows. Most previous studies (including Alfaro and Hammel, 2007) use *de jure* measures of capital account openness and financial liberalization – mirroring legal restrictions on cross-border capital movements – to investigate their growth effects. However, as Kose et al. (2009b) point out, the collateral benefits of financial globalization are more likely to be perceived through *de facto* integration. Many developing countries have rigid capital controls but, at the same time, are recipients of a significant amount of foreign inflows. Second, most studies to date usually focus only on aggregate capital inflow and hence neglect the heterogeneous nature of foreign capital inflows that justifies differentiation of capital inflows when considering their impact on the real economy. Foreign capital can flow through different instruments, such as equity and debt. More importantly, it can reach different borrowers in host countries, such as those in public, financial and corporate sectors, factors ignored by most existing studies (including Leblebicioğlu and Madariaga, 2015). Third, mixed findings in these studies might also be attributable to the use of aggregate output growth indicators. The responses of different economic sectors to capital inflows may vary. For example, sectors depending more on external sources of financing for growth may respond to capital inflows differently than do their less dependent counterparts. This is especially true for less developed countries where credit constraint is a major obstacle to firms’ growth. Aggregate growth data do not allow for control for such sector-specific factors (Contessi and Weinberger, 2009). In addition, aggregate growth indicators may increase the likely endogeneity between capital inflows and growth if growth encourages more foreign capital ([Li and Liu, 2005](http://www.sciencedirect.com/science/article/pii/S0304387809000121%22%20%5Cl%20%22bib37)). Overall, this project’s approach differs from existing literature in that it tests a microeconomic channel through which different types of capital inflows, by instrument and by borrower type, affect growth through capital goods imports.

## **Goals & Objectives**

Developing countries can stimulate their economic growth by importing more capital goods from advanced economies. The growth rate in these developing countries is positively associated with more use of foreign capital goods relative to domestic ones for the production of capital stock (Lee, 1995). However, credit constraints in less developed countries act as a major impediment for firms seeking to import better technology. The main goal of this research is to investigate whether foreign capital inflows can mitigate this problem. Potentially important benefits of capital inflows to host countries are the relaxation of credit constraints, augmentation of investment resources, and, accordingly, facilitation of growth (Harrison et al, 2004). In addition, capital inflows can provide new opportunities for developing countries to improve their trade activities and hence advance imports of foreign capital goods (Ding et al., 2019). This research project studies whether capital inflows can relax credit constraints in developing countries by facilitating imports of capital goods. To the best of our knowledge, there are only two papers addressing similar questions (Alfaro and Hammel, 2007; Leblebicioğlu and Madariaga, 2015), but they analyze this issue at the aggregate country level, relying on a mix of both developed and developing countries. This project is the first to investigate the effect of capital inflows on sectoral level imports of capital equipment goods in devloping countries.

The objectives of this research project are threefold:

**1. Fill a gap in existing empirical research:** This project addresses a significant gap in current empirical research by investigating whether industrial sectors that are financially vulnerable import more capital goods than do other sectors. In particular, while other studies usually focus on the importance of capital inflows for growth in developing countries through the channel of TFP, this project analyzes the effect through the mechanism of capital goods imports using industry data.

**2. Provide a comparative study:** Does the impact of capital inflows on economic activity differ across developing countries based on their institutional quality? We systematically compare two groups: those with high institutional quality and those with less. This informs us about the institutional arrangements that need to be addressed before attracting more foreign funds. Specifically, we systematically distinguish developing countries that have better institutions from those with poor ones in order to examine whether the responsiveness of the real economy to cross-border capital inflows in developing countries differs according to their absorptive capacity, given the different types of financial systems and institutions. We do this by employing data for a large panel of developing countries.

**3. Policy advice:** By investigating the impact of capital inflows on economic growth through the channel of capital goods imports, this research will identify policy implications which may be useful in encouraging both capital inflows and international trade in capital goods.

## **Broader Impacts and Indicators**

This project is part of our effort to better elucidate the association between financing and economic growth in developing countries. Substantial increases in foreign capital flowing into developing countries, accompanied by the need to import more technology, require a better understanding of the interaction between capital inflows and capital goods. The findings of this research should be of interest to policymakers and international organizations, such as the World Bank. The quantity and quality of financial resources are crucial factors for achieving sustainable economic growth in developing countries. This project’s study of the growth impact of capital inflows on economic activity should prove valuable in understanding this issue.

Furthermore, this project is based on the principal investigator’s (PI) previous publications on the effect of financing on growth (see, e.g., Igan et al., 2016; Liu et al., 2014; Mirzaei and Grosse, 2019; Mirzaei and Moore, 2019). This project also seeks to serve as the basis for pursuing other aspects of the issue in the future. First, we intend to extend our project by studying whether capital goods imports positively affect growth and the structure of industrial sectors. The importance of capital goods for economic development has been studied at the aggregate level but not at the sectoral level. Second, we are interested in investigating how capital inflows affect Islamic banks’ performance in countries with dual banking systems. Specifically, by developing our project, we can examine the response of Islamic banks’ lending activities to international financial inflows. Capital inflows are expected to increase access to financing, but, at the same time, they may also complement existing conventional banks and thus provide opportunities for Islamic banks to grow faster. There is currently no literature on this issue. Our dataset on capital inflows could be used to study this issue as well. Thus, this project’s findings would help us clarify the linkage between financial constraints and economic performance in developing countries as well as advance our future projects in the same areas. Finally, our research will involve undergraduate and graduate students and would enrich our students’ research skills.

## **Proposed Project & Work Plan**

This research project aims to examine the economic impact of foreign capital inflows in developing countries. In particular, we examine whether industries that are financially more dependent on external financing import disproportionately more capital goods if they are located in countries receiving a considerable amount of capital inflows. We use a panel data for manufacturing sectors for a large number of developing countries over the period 1990–2017. By employing the widely-used Rajan and Zingales’ (1998) approach, we use an interaction term between a proxy for capital inflows and a proxy for the sector’s dependence on external financing. Our empirical model and data collection strategies can be summarized as follows:

**D.1. Model Specification**

Our main empirical strategy is to examine whether capital inflows facilitate capital goods imports in financially dependent industries. Our model specification is represented in the following equation:

$$Imp\_{j,c,t}=∅+α.S\_{j,c,t-1}+β.CF\_{c,t}×D\_{j}+φ.X\_{c,t}×D\_{j}+ε\_{j,c,t} (1)$$

where $Imp\_{j,c,t}$ refers to imports of capital goods in sector $j$ in country $c$ in the period $t$. Following Alfaro and Hammel (2007), we use as dependent variables both the percentage of capital goods imports to value added and the percentage of capital goods imports to total imports. $S$ is the share of value added of each industry to total value added of all industries in a country, with a lag of one period. We control for this industrial share of total value added due to the heterogeneous degrees of development across different industries within one country. $D\_{j}$ is a proxy for each industry’s dependency on external financing (Rajan and Zingales, 1998). $CF\_{c,t}$ is a vector of capital inflow variables for country $c$ in year $t$. To examine how patterns of capital inflows affect relative imports of capital goods of industries that are financially dependent, we use an interaction between a proxy for capital inflows variable and a proxy for external dependence ($CF\_{c,t}×D\_{j}$). We aim to use seven variables as proxies for capital inflows (aggregate and disaggregate by borrower type and by instrument) as follows: total private capital inflows ($CF$) are made up of inflows to financial institutions ($CF^{1}$) through equity ($CF^{1-1}$) and debt ($CF^{1-2}$), and inflows to corporations ($CF^{2}$) through equity ($CF^{2-1}$) and debt ($CF^{2-2}$), where$ CF=CF^{1}\left(CF^{1-1}+CF^{1-2}\right)+CF^{2}\left(CF^{2-1}+CF^{2-2}\right)$.

The literature (e.g., Rajan and Zingales, 1998), confirms that the financial development of a country affects industry growth through the channel of firms’ financial dependence, while also recognizing the effects of credit constraints on capital goods imports (Fauceglia, 2014). Furthermore, trade liberalization can facilitate imports of machinery and equipment and hence investment. Thus, to disentangle the effects of capital inflows, we must control for: (i) a proxy for overall availability of domestic credit interacted with external financial dependence; and (ii) a proxy for a potential change in trade liberalization policy interacted with external financial dependence (shown as $X\_{c,t}×D\_{j}$).

Equation (1) can include a rich set of industries, countries, years, and their interaction dummies ($∅$). Following Dell’Aricia et al. (2008), our goal is to use the most rigid specification, in terms of degree of freedom, where we include three types of fixed effects: industry-country ($∅\_{jc}$); industry-year ($∅\_{jt}$); and country-year ($∅\_{ct}$) fixed effects. We do so to control for all types of unobservables: $∅\_{jc}$ controls for cross-industry, cross-country fixed effects, such as industrial policies in each country; $∅\_{jt}$ captures time-variant, industry-specific factors that influence cross-industry imports of capital goods, such as industrial R&D investment; and, finally, $∅\_{ct}$ accounts for time-variant, country-specific factors that might drive cross-country differences in investment, such as institutional and legal environments. Thus, one key advantage of our three-dimensional (industry–country–year) panel is that it allows us to use interacted fixed effects to control for a wide array of omitted variables (Hsu et al., 2014). Indeed, the only shocks not controlled for are those varying simultaneously across industrial sectors, countries, and time.

Furthermore, we estimate Equation (1) using the ordinary least squares (OLS) estimator. Residuals from OLS estimations of panel data may be correlated across industries and countries, resulting in biased standard errors. Thus, following the procedure proposed by Petersen (2009), we use two-way industry and country level clustering to account for correlations among different industries in the same country and among different countries in the same industry. The coefficient of interest is $β$, which measures the differences among the imports of capital goods in financially vulnerable sectors in countries attracting high and low foreign capital inflows.

One might argue that the typical issue of endogeneity may continue to exist in Equation (1). We expect that the problem of reverse causality is not critical here, because we use sectoral level data and it is unlikely that capital would flow into countries because of growth in imports of capital goods in a specific industry. However, a more serious issue could be that of a correlation arising because of omitted variables. For example, industries in more politically stable countries or in countries with a high degree of investment freedom may attract more foreign capital, and firms in such countries may also import more capital goods. Additionally, countries with better institutions may experience both more capital inflows and imports of capital goods. To mitigate the omitted variables bias, we control for observable characteristics, especially at the country/industry level, that may affect relative imports of capital goods and then use selection on these observable factors to determine the possibility that our estimates are being driven by unobserved heterogeneity across countries/industries (Altonji et al., 2005). Finally, Equation (1) will be adjusted, developed and saturated further as we complete the literature review and data analysis. We will also perform a series of sensitivity tests to further mitigate the endogeneity issue.

**D.2. Data**

We use a range of sectoral-level and country-level data as follows:

*Data on industries*

The manufacturing data are from the United Nations Industrial Development Organization (UNIDO) Industrial Statistics Database. The UNIDO reports disaggregated yearly data on industrial sectors. The database contains data on value added, output, number of establishments, gross fixed capital formation, and employment numbers. However, data on capital goods imports are not available from this dataset and we need to merge UNIDO data with data from other databases. First, we will consider the UN Comtrade database that contains annual bilateral merchandise trade for all countries up to five-digit Standard International Trade Classification (SITC). The second database we will explore is the OECD Bilateral Trade in Goods. We will also turn to the World Bank and the World Trade Organization (WTO) to further determine the availability of additional data. Our initial assessment suggests that data on capital goods imports by industry appear to be attainable from the OECD.

The degree of financial dependence of each industry on external sources of financing comes from Rajan and Zingales (1998). They assume that financial markets in the United States are relatively frictionless and informative and, consequently, industry characteristics based on U.S. firm data reflects only technological characteristics rather than U.S. industry norms. As a result, Rajan and Zingales employ U.S. firm level data to measure the external financial dependence of each industry by computing the share of investment not financed with internal cash flows.

*Data on capital inflows*

We aim to establish a comprehensive dataset of capital inflows for a large number of developing countries at an annual frequency. We are interested in examining whether breaking down cross-border capital inflows by type (and, if available, by industry) affects the growth of financially dependent industries in the recipient countries in different ways. To do this, we review important databases that report international capital inflows. First, we consider the Institute for International Finance (IIF) dataset. Second, we inspect the OECD databases. Third, we look at the Balance of Payment (BOP) data from the International Money Fund (IMF) database, the one commonly used by researchers studying international capital inflows. Finally, we examine the Bank for International Settlements (BIS) cross-border bank capital inflow data. Overall, we review these databases to determine whether we can obtain data preferably at the industry level or at least by borrower type. Our initial assessment indicates that capital inflows data by borrower are obtainable, but data by industry needs to be researched further.

*Data on countries*

Other country-level data will be retrieved from the standard databases, such as the IMF-IFS (International Financial Statistics) database and the World Bank database.

Note that the choice of the final sample is dictated by the availability of data, especially data on capital goods at the sectoral level. In addition, in order to engage in data collection, we may need to visit and use databases of external sources, such as the IMF, BIS, UNIDO, and/or U.S. and European universities.

**D.3. Work Plan**

The project is expected to last approximately two years. In year one, we intend to review literature and collect and analyze data. About four months will be devoted to the literature review and eight months to data collection, choosing appropriate methodology and analyzing the data. In year two, after about four months, we will produce an initial draft of our findings and present it at international conferences. The final draft should be produced in the seventh month of that year, before submission to a journal in the 11th month.

**Team Commitment**

The PI assumes the main responsibility for the project. The role of the PI is to perform the literature review, collect research data, and conduct the analysis. The PI is qualified to carry out these functions based on his past publications and his current working papers as presented in his CV below. The PI also has the responsibility of visiting academic and international institutions and/or attending conferences in order to obtain data, exchange ideas with other researchers, and disseminate results. Overall, eighty percent of the research work will be done by the PI.

The main role of the co-investigator (Co-I) is to help the PI justify the topic, establish empirical strategies, and improve the working paper(s). Given his past publication on topics related to emerging/developing countries, the Co-I is qualified to improve the overall quality of the working paper(s), exchange ideas with other leading researchers, and perhaps present results at international conferences. The Co-I’s contribution is about twenty percent.