

IMF conditionality, export structure and economic complexity:

The ineffectiveness of structural adjustment programs¹

Firat Demir

Department of Economics

Room 436 CCD1, 308 Cate Center Drive

University of Oklahoma

Norman, Oklahoma, USA 73019

E-mail: fdemir@ou.edu

Journal of Comparative Economics 50(3): 750-767, 2022. URL: <https://doi.org/10.1016/j.jce.2022.04.003>

¹ **Acknowledgments:** I thank Valentin Lang for sharing the data on IMF liquidity, and Tejas Ghirnikar for research assistance. I also thank Amitava Dutt, Codrina Rada, Roberto Veneziani and seminar participants at the 2021 Analytical Political Economy workshop. This (publication) was made possible (in part) by a grant from the Carnegie Corporation of New York (grant number, G-20-57642), and the University of Oklahoma College of Arts and Sciences summer research grant. I am also thankful to the Fulbright Commission, and the Vilnius University Faculty of Economics and Business Administration for my Fulbright visit in 2022. The statements made and views expressed are solely the responsibility of the author.

IMF conditionality, export structure and economic complexity:

The ineffectiveness of structural adjustment programs

Abstract

The conditionality requirements of the International Monetary Fund (IMF) have been a source of intense debate since the early 1980s. These conditions, which are attached to IMF lending programs, cover a variety of issues from fiscal and monetary reform to economic liberalization and institutional change. In this paper we empirically examined the effects of IMF programs and conditionality requirements on structural transformation through changes in the technology-and-skill intensity and overall economic complexity of exports. Our empirical methodology accounted for policy and conditionality heterogeneity across country and time and accounts for the endogeneity of IMF programs and conditions. The empirical results suggest that IMF programs and conditionality requirements along a spectrum of policy areas had no robust or significant effect on export structure, economic complexity or export diversification. Overall, we found no evidence of any positive effects of IMF programs or IMF conditionality requirements on the technology-and-skill intensity of exports.

JEL Codes: F33; F43; O14; O19; O33

Keywords: IMF programs; IMF conditionality; Structural change; Export sophistication; Economic complexity

1. Introduction

Since 1980s the conditionality-induced Structural Adjustment Programs (SAP) of the International Monetary Fund (IMF) have become a major part of the standard crisis-management and post-crisis economic reform toolkit. According to IMF, these reforms aim at restoring or maintaining “balance-of-payments viability and macroeconomic stability while setting the stage for sustained, high-quality growth” (IMF, 2019a). Particularly, promoting growth has been a major goal of IMF lending since the 1990s as IMF’s mission evolved from a short-term liquidity provider to a long-term development agency (Boughton, 2012, p.196; Reinhart and Trebesch, 2016). In this paper we examine the effects of IMF program participation and policy conditions on structural transformation through changes in export sophistication.

The IMF policy reforms are distributed over years and are attached to IMF loans as pre-requisites. The IMF Executive Board supervises the adoption of these reforms and decides on the disbursement of IMF loans, pending a positive review by the IMF staff on their successful implementation, also called “demonstrable policy actions.” However, despite their wide-spread adoption, we still do not know whether these reforms actually work as the empirical evidence on their effectiveness remains quite limited. The IMF measures the success of its programs according to “the frequency of successor program engagements,” which is hardly a real measure of success (IMF, 2019b, p.9). Besides, more than a quarter of IMF members have had an IMF program 50% or more of the time since they became an IMF member (Reinhart and Trebesch, 2016). Moreover, in case of program failures, or repeated program engagements (which have increased overtime), the IMF puts most of the blame on errors in implementation and surveillance gaps rather than the programs themselves. Or, even when IMF’s own research shows that programs failed or program objectives remained “often ambiguous,” they call for more reforms and tighter surveillance (Andritzky et al., 2021). In few cases when IMF admits that the impact of its adjustment programs “was less-growth friendly than

anticipated” and that “the assumed payoffs from structural reforms [for productivity and growth] were overly optimistic” and in fact “some reforms weigh on growth in the short run”, it insists that they will be “paying off” later (IMF, 2019b, pp.19-20, 39).

Several studies tried addressing this deficit in evaluating IMF program effectiveness, though focusing on program participation rather than program conditions. Dreher and Vaubel (2004) fail to find any effect of IMF conditionality monetary growth, budget deficit, current account balance, international reserves, and government spending. Furthermore, Przeworski and Vreeland (2000), Barro and Lee (2005), Butkiewicz and Yanikkaya (2005) and Dreher (2006) report a negative relationship between IMF program participation and economic growth, while Easterly (2005) finds no significant relationship at all. Barro and Lee (2005) also detect no significant effect of increasing IMF programs on investment, inflation, government consumption, and openness. Moreover, Dreher and Walter (2010) finds that IMF programs increase the likelihood of a currency crisis. IMF programs are also shown to increase the within-country inequality (Forster et al., 2019). There is also evidence of increasing social conflicts, weakening democracy, and higher probability of military coups after IMF interventions (Przeworski and Vreeland, 2000; Barro and Lee, 2005; Abouharb and Cingranelli, 2007; Casper, 2017). Furthermore, IMF programs are shown to have an ideological bias in their design, aiming to dismantle developmentalist state capacity, limit public sector interventions and protect foreign creditors (Przeworski and Vreeland, 2000; Grabel, 2011; Boughton, 2012; Eichengreen and Woods, 2016; Kentikelenis et al., 2016; Babb and Kentikelenis, 2018).

No study, however, has examined the direct effects of IMF program participation and program conditions on structural determinants of long run development and growth. Particularly, we know little about how IMF reforms affect structural transformation through changes in the technology-and-skill intensity of exports, which could help explain the causes of reported negative or insignificant growth effects of IMF programs. The silence of IMF on the effects of its programs on the structural

causes of long run growth, even after hosting a conference on ‘diversification and structural transformation’¹ in 2013, is especially surprising, and has been noted by the IMF’s own review of program design and conditionality (IMF, 2019b, p.54, 62).²

But why should we care about trade structure? Economic development is about structural change, whereby countries move away from primary products to more advanced manufacturing and higher value-added services. Furthermore, what you export matters for long run development, which is a dynamic process reinforced by reallocating resources towards manufacturing sectors that enjoy increasing returns. The pioneers of development economics heavily emphasized this transformation and its role in long run development and growth (Myrdal, 1957; Hirschman, 1958; Kaldor, 1966). Recent studies confirm these insights, showing that increasing product sophistication and economic complexity are the main drivers of structural change and long-run growth (Amsden, 1989; Lall, 2000,

¹ See, <https://www.imf.org/en/News/Seminars/Conferences/2016/12/30/Diversification-and-Structural-Transformation-for-Growth-and-Stability-in-Low-Income-Countries>.

² As of February 2022, IMF working papers (out of 7,519 papers), IMF Staff Papers and its newer version, IMF Economic Review (out of 1,299 papers), published less than twenty papers altogether since January 1, 1980, examining empirically any aspect of the IMF program effectiveness. Of this number, none was on structural change. We used the following keywords for search: conditionality, SAPs, structural reform, structural change/transformation, IMF agreement, IMF-supported programs. Interestingly, even in a conference on “diversification and structural transformation” that was sponsored by IMF in 2013, there was rarely any reference to IMF research in any of the papers (<https://www.imf.org/en/News/Seminars/Conferences/2016/12/30/Diversification-and-Structural-Transformation-for-Growth-and-Stability-in-Low-Income-Countries>). For example, in Lederman and Maloney (2012), which was presented in that conference, there was only one reference to any IMF research out of over 200 papers cited in its references list.

2001; Imbs and Wacziarg, 2003; An and Iyigun, 2004; Lall et al., 2006; Hausman et al., 2007; Hidalgo et al., 2007; Hidalgo and Hausmann, 2009; Cadot et al., 2011; Bustos et al., 2012; Lederman and Maloney, 2012). Exports that are more technology-and-skill-intensive, for example, have stronger productivity and growth effects as they facilitate faster physical and human capital accumulation and technological advancement. Endogenous growth and spillover effects are also the highest in the production of higher-skill manufactures, allowing greater scope for dynamic gains. Thus, economic growth and the catching-up process goes hand in hand with export diversification and sophistication.

What role does IMF play in this structural change? The advocates of the IMF interventions point out various developmental and growth benefits of IMF reforms including structural, institutional, fiscal, monetary and external account reforms, and economic liberalization in trade, finance, and labor markets. Exchange rate reforms, for example, can help increase competitiveness of manufacturing industries, and move resources from nontradable goods, thereby increasing the skill content of exports. These reforms can also improve the entry and survival rates of exporters. Likewise, liberalizing international trade and investment can correct price distortions, increase efficiency and productivity through competition, and thus contribute to increasing export sophistication. Financial sector reforms can help financial sector development, credit market deepening, and increase credit to private sector, all of which can facilitate the development of more skill intensive and value-added industries with higher external finance needs (Levchenko, 2007; Sheng and Yang, 2016). Similarly, limiting public sector interventions through privatization of State-Owned Enterprises (SOEs), streamlining government bureaucracy, and reducing budget deficits can increase efficiency and competition while preventing crowding out, all of which can encourage development of higher value-added industries. Institutional reforms can improve the rule of law and bureaucratic quality, allowing the growth of higher value-added sectors and introduction of new products (Levchenko, 2007; Sheng and Yang, 2016).

The opposite of these expectations is also true. The supposed positive effects of trade liberalization, for example, are found to be elusive, if existent at all (Rodríguez and Rodrik, 2010; Rodrik, 2016). Likewise, the assumed growth enhancing effects of flexible exchange rates are widely disputed (Demir and Razmi, 2022). The same ambiguity goes for financial liberalization and its growth effects (Prasad et al., 2007; Dreher and Walter, 2010; Buman et al., 2013). After decades of privatization, the debate over whether it stimulates efficiency, growth, investment or technology and skills upgrading is also not settled yet (Hodge, 2018). Through undermining the developmental state capacity, IMF reforms are also argued to hurt the development probabilities of low- and middle-income countries (Gabel, 2011; Eichengreen and Woods, 2016; Kentikelenis et al., 2016).

Surprisingly, most of IMF program predictions remain theoretically ambiguous *and* empirically untested. While IMF's own review of its programs referred to growth over 300 times in a single report, it hardly discussed the effects of programs on the *determinants* of growth except for admitting that it frequently overestimated program-induced "productivity gains and capital investment" (IMF, 2019b). In other instances, the focus has been on the balance of payments, public debt, or central bank reserves. This is surprising given the insights from development economics, structuralist macroeconomics and the 'new' new trade theory, which emphasize the importance of building comparative advantage in high value-added sectors as a condition for long run growth and development (Lall, 2000, 2001; Imbs and Wacziarg, 2003; Lall et al., 2006; Hausman et al., 2007; Cadot et al., 2011).³

In this paper we make four contributions to the literature. First, we explore the effect of IMF

³ The lack of attention to determinants of growth is widespread in IMF publications. See, for example, Andritzky et al. (2021, p.18), which proposes recommendations to maximize gains from SAPs, limit its program evaluation criteria to aggregate growth and employment, fiscal stability and inequality.

program participation and conditionality on the technology-and-skill intensity of exports (i.e., export sophistication). Second, we examine the importance of country heterogeneity as revealed in the composition of exports as well as the content and coverage of IMF conditions. Third, we capture policy and conditionality heterogeneity along a spectrum of areas and across country and time. Fourth, in the estimation methodology, we account for the endogeneity of selection into IMF programs, and the endogeneity of IMF conditions in a country that is selected into an IMF program.

Our empirical analysis is based on data on IMF conditions and export structure in 175 countries between 1980-2014. In the estimation, we use a joint estimation method and employ instrumental variables to tackle the endogeneity of IMF program participation and IMF conditionality requirements. The empirical results suggest that IMF programs and conditionality requirements along a spectrum of policy areas has no robust or significant effect on trade structure, economic complexity or export diversification. Overall, we find no evidence of any positive effects on the upgrading of technology-and-skill intensity of exports. These results are robust to a rich battery of robustness tests.

The rest of the paper is organized as follows: The next section presents a discussion of the evolution of IMF conditionality requirements. Section 3 discusses the data and empirical methodology. Section 4 provides the results and section 5 presents sensitivity analysis. Section 6 concludes.

2. Changing nature of IMF conditions

The IMF was established at Bretton Woods in 1944 and was tasked to ensure global financial stability. The article 1 of IMF's Articles of Agreement explains its purposes as “international monetary cooperation,” “expansion and balanced growth of international trade”, “promotion and maintenance of high levels of employment and real income”, “development of productive resources,” “exchange stability,” and “shorten the duration and lessen the degree of disequilibrium in the international balances of payments of members” (IMF, 2019c). To achieve these goals, IMF has a variety of tools, including lending, which is supposed to give a “breathing room” to implement adjustment policies

and comes with conditions that are designed to target structural problems in borrowing countries (IMF, 2019d). Particularly, before the IMF provides funding to a member state, its government needs to make commitments to implement certain policy actions, also known as policy conditionality, covering a wide variety of areas such as public balances, external accounts and institutional changes (IMF, 2019d). The goal, according to the IMF, is to enable a more growth and investment conducive economic environment, which, as a result, can have a direct effect on export structure of a given country.

We summarize different categories of IMF conditions in Table 1, based on Kentikelenis et al. (2016, 2017). The policy conditions take two forms, quantitative and structural (Boughton, 2012; Kentikelenis et al. 2016, 2017). Quantitative conditions, which make up a majority of conditions, are divided into two groups, qualitative performance criteria and indicative benchmarks. These are measurable benchmarks that relate to macroeconomic variables such as monetary and credit aggregates, fiscal balances, external borrowing or international reserves. Structural conditions are wider in scope and aim at changing the structure of the economy and focus on microeconomic foundations, including policies such as privatization, elimination of price controls, labor market deregulation and tax reform. Structural conditions include prior actions, structural performance criteria and structural benchmarks. Table 1 part B also divides IMF conditions into 13 non-overlapping areas, covering issues from privatization to institutional reforms, all of which can, in theory, affect the export sophistication. The IMF loans are distributed over multiple installments and are conditional on the successful implementation of policy actions as deemed necessary by the Fund, thus allowing considerable leverage to IMF over borrowing countries.

<Insert Table 1 Here>

Since 1980s, the IMF conditions have become more complex and wider in scope, covering a broader range of issues that are assumed to be important for financial stability and long run growth,

including governance, social policy, institutional reform, Central Bank policy, fiscal issues, trade and foreign exchange systems, labor markets, gender equality, and public enterprises (Boughton, 2012; Kentikelenis et al., 2016; Eichengreen and Woods, 2016; Reinhart and Trebesch, 2016; IMF, 2019b). The average duration and repetition of an IMF program has also increased (Reinhart and Trebesch, 2016) Furthermore, IMF expanded the use of four techniques in its conditionality toolkit (Boughton, 2012, pp. 194-195). First, it complemented its “quantitative performance criteria” with a growing number of “structural performance criteria” such as limits on public sector borrowing. Second, it steadily added more “structural benchmarks” to its arrangements. Third, the IMF made an increasing use of “prior actions,” which included policy actions borrowing countries needed to undertake before an IMF program is considered by the Executive Board. Fourth, the IMF expanded the scope of its program reviews. We can see this transformation in IMF conditionality in Figure 1, which shows the annual averages in five categories of IMF conditions, Quantitative benchmark criteria (QPCs), Indicative benchmarks (IBs), Prior Actions (PAs), Structural Performance Criteria (SPCs), and Structural Benchmarks (SBs).

To illustrate the increasing range of conditions that are now required in IMF programs, we can look at the experience of Turkey after its 2001 financial crisis when it signed a three-year IMF stand-by agreement for \$16 billion, which was 1,330% of its quota. The 2002-2004 IMF program included a wide set of structural conditions, including reforms in banking sector, central banking, monetary policy, fiscal policy, financial sector, tax policy, public expenditure management, private sector development, pension system and social security, SEEs, and anti-corruption. The IMF staff review also put the core blame for the “disappointing growth performance” on inefficiencies in SEEs (p.43) and interventionist public sector policies (p.42). Its prior actions, for example, included eliminating ‘all open, unfilled, redundant positions’ at SEEs (through voluntary retirement offers and layoffs, reducing “the number of redundant workers by one-third by end-June, and cumulatively by

two-thirds by end-October 2022” (p.103)), and ‘closing regional administrations and other regional line agency offices, and block relevant budget appropriations” to meet the primary surplus target of 6.5% of GNP” (p. 46). In total, fiscal policy had nine, public debt management had eight, monetary and incomes policy had 14, banking reform had 24, corporate debt restructuring had 11, public sector reform had 37, and private sector reforms had 27 conditions (including sub conditions) (IMF, 2002). Reflecting IMF’s one size fits all approach, a very similar three-year stand-by agreement was signed with Greece as well after its major financial crisis in 2010 for almost \$40 billion, 3,212% of its quota (IMF, 2010).

<Insert Figure 1 Here>

All 13 IMF condition areas in Table 1 can influence export structure. Take, for example, SOE reforms. According to the IMF, SOEs are inherently inefficient, suffer from mismanagement, corruption and rent seeking and therefore need to be privatized to stimulate long run growth and development (Brune et al., 2004). SOE reforms, therefore, can improve the trade structure by inducing investment upgrading, better managerial and operational capabilities and increasing productivity, efficiency and profitability. The IMF programs also require liberalization of the financial sector, Central Bank reforms, trade liberalization, capital account opening, adapting a flexible exchange regime as well as business friendly institutional reforms, all of which are assumed to stimulate development of productive resources, productivity and growth. Likewise, labor reforms can improve productivity and increase the firms’ export probability as well as the product, quality and skills upgrading. The same can be said for institutional reforms, as a large literature on the linkages between institutional development and technology and skills intensity of exports suggest. Land environment reforms can also affect trade structure by inducing firms to upgrade their technologies and production structures. While there is no academic consensus, theoretical or empirical, regarding the desirability or

effectiveness of most of these reforms, IMF has been pushing for them since the 1980s (Rodrik, 2006; Rodrik and Subramanian, 2009; Ostry et al., 2016). This is what we aim to test in this paper.

Since 1980 the number of IMF conditions (i.e., the number of times soft and hard conditions applicable in a given year) increased from an average of 12 (or a total of 412) in 62 countries to an average of 39 (or a total of 1,356) in 37 countries in 2014 (Figure 2, also see Appendix Figure A1). The peak was 2,983 conditions in 73 countries in 1996. We should also note that the number of conditions varied greatly across countries with the standard deviation increasing from 6 in 1980 to 26 conditions in 1999, before falling to 20 in 2014. The highest number of conditions was in Ukraine in 1999 with 148 conditions followed by Russian Federation with 143 conditions in 1998.

Figure 3 shows the shares of top four policy areas under IMF programs. Between 1980 and 2014, each year on average, Debt (DEB) with 31%, Finance (FIN) with 28%, Fiscal policy (FP) with 16%, and external accounts (EXT) with 9% received most of the 58,406 conditions under IMF programs.⁴ We also see some changing trends where the importance of conditions on Debt and Finance has declined while that of Fiscal policy has increased. Out of 13 policy areas, the top ones, DEB (28.4%), FIN (26.1%), FP (16.6%), EXT (8.8%), RTP (7.3), SOE (4%) accounted for over 91% of total number of soft and hard conditions, while the share of OTH, ENV and SP were less than 1% each (Table 1). Furthermore, eight policy areas have almost 60% of the total conditions classified as soft conditions: POV (89.1%), OTH (78.7), INS (68.3%), ENV (65.9%), RTP (62.2%), LAB (62%), SOE (57.1%). For the remaining four, SP, FP, FIN, EXT, DEB, more than half of the total are hard conditions. In terms of the waivers (i.e., comparing BA2 with cBA in Table 2), we do not observe a

⁴ The debate over the extent to which the IMF conditions are imposed or self-selected is not a settled one and is a source of controversy. For a review of the related literature, see Stubbs et al. (2020).

clean distinction across 13 policy areas and the percentage of ‘waived’ policy conditions range between 8.6% (OTH) and 27.7% (FP).

<Insert Figures 2 & 3 Here>

These reforms are assumed to facilitate the “promotion and maintenance of high levels of employment and real income” and “development of productive resources” through a variety of channels. The IMF’s own reviews of program design and conditionality emphasizes the following six indicators as signals for sustainable growth: current account balance, including growth of exports and imports; international reserves, growth, fiscal balance, public debt and market access, and the stock of non-performing loans (IMF, 2019b). However, none of these indicators directly relate to any determinants of long-run development and growth. They might be important for short term financial stability and balance of payments constraints, but how about their effects on long run structural change and development of productive resources? In this paper we are interested in one channel that can affect long run growth and development, the export structure. As discussed earlier, all 13 IMF conditions in Table 1 can affect export structure. However, despite the uneven distribution of these reforms across each area and given the lack of any guidance from the IMF in terms of their distinct effects, we do not know their order of importance or any heterogenous effects. These are questions that we examine next.

3. Empirical analysis

3.1. Data

The data on IMF conditionality is from Kentikelenis et al. (2016, 2017) and provides information on conditionality requirements along a spectrum of areas across country and time for all IMF members between 1980-2014. The ability to capture policy heterogeneity in IMF programs across time and space is the biggest advantage here, one that previous studies with a binary variable approach lack. In fact, relying on a dummy variable approach for IMF program presence makes identification both for

internal and external validity very difficult. As summarized in Table 1, IMF conditions are either *quantitative* or *structural*. Based on the quantitative vs. structural conditions duality, there are five types of conditions, which are Quantitative Performance Criteria, Indicative Benchmarks, Prior Actions, Structural Performance Criteria, and Structural Benchmarks. The dataset separates conditions into 13 mutually exclusive and non-overlapping policy areas including: fiscal issues, revenue and tax issues, financial sector, monetary policy and Central Bank issues, SOE reform and pricing, SOE privatization, external debt issues, labor issues, social policy; redistributive policies; institutional reforms; land and environment; and a residual category. Given the lack of any theoretical or empirical guideline as to the relative importance of these 13 areas of conditions for export structure as well as their high degree of correlation, we use, in the benchmark analysis, the total number of conditions attached to each of these areas in each country in each year.

We adopted this composite indicator, called the “Burden of Adjustment Indicators” (BAs), to measure the degree of “hard” and “soft” conditions for each country that is adopting the IMF programs. We use BA2 in the benchmark estimates as it includes only *hard conditions*, which receive the most emphasis from the IMF and their implementation is a must for concluding a review and to release disbursements of loans. In case they are not implemented, a waiver is needed from the Executive Board. In contrast, soft conditions do not have the same degree of enforcement, and no waiver is necessary when they are not met as their lack of implementation do not automatically cause suspension of an IMF loan (Kentikelenis et al., 2017; Stubbs et al., 2020). Thus, the composite variable BA2 allows us to separate binding conditions from non-binding ones and examine whether they affect the trade structure. Our measure includes both quantitative and structural conditions, containing specific quantitative policy targets (i.e., level of external public debt) as well as structural reforms (i.e., privatization). Later in the robustness analysis, we employ alternative measures of IMF conditionality, including two other measures of BAs, that are ‘implementation corrected’ and ‘implementation

discounted', which capture different dimensions of conditionality. We also examine quantitative and structural conditions separately and include a disaggregated measure of BA by its 13 subcomponents.

We should note that we treat the number of conditions that are applicable in a given year as a proxy for the scope and depth of conditionality requirements, both in total and per policy areas. They also aim to capture the overall burden of IMF programs. However, this is obviously an imperfect method to capture the full cost of IMF program implementation, which are heterogenous across different IMF conditions and across countries (Dreher et al., 2015; Stubbs et al., 2020). The burden of implementation is also likely to be non-stationary as it changes over the years with changes in IMF program priorities, content, depth, and enforcement. Countries' ability to implement these policies also changes across different policy areas and years as their adoptive and implementation capabilities change. Therefore, the sum of IMF conditions does not capture the full burden of program implementation. The financial cost of implementation is also likely to be uneven and non-linear across different policy areas. In other words, it may very well be the case that not all conditions are equal in terms of importance, priority, and cost of implementation. We undertake our empirical exercise given these caveats and the lack of alternatives, which would better capture the depth and implementation cost of these conditions. We should also note that IMF's own evaluations also rely on count measures of conditionality requirements (e.g., Andritzky et al., 2021).

The trade data are from the Observatory of Economic Complexity (2021), based on UN COMTRADE. We include exports between 176 countries at 4-digit level (SITC4 Rev.2) for the period 1980-2014. To measure export sophistication, we use Lall (2000) and classify exports according to their technology-and-skill-intensity into five categories: high-skill manufactures (*high-skill*), medium-skill manufactures (*medium-skill*), low-skill manufactures (*low-skill*), resource-intensive manufactures (*resource-intense*), and primary products (*primary*). In this setting, turbines, for example, are classified as high-skill while chemicals and clothing are classified as medium and low-skill, respectively. Petroleum

products are included in the resource-intensive manufactures and crude petroleum is in the primary products (the full product classification is in the Appendix A). Next, we aggregated these product categories at the country level and used the weighted average (i.e., divided by five) of the percentage share of each group of exports in total exports of each country in a given year as our measure of the level of technology-and-skill intensity (*Intensity*) of exports. The weights (in parenthesis) for each product category are as follows: high-skill manufactures (5), medium-skill manufactures (4), low-skill manufactures (3), resource-intensive manufactures (2), and primary goods (1). As shown by Lall et al. (2006), the technology-intensity based classification is highly consistent with the revealed income mix based sophistication measures. In the robustness section, we also experimented with three additional measures of export sophistication based on OECD (2011), the Economic Complexity Index (ECI) of the Observatory of Economic Complexity (2021), and the Herfindahl concentration index.

Figure 4 shows the level of average *Intensity* for the full sample, for Emerging South and the Rest of South between 1980 and 2014.⁵ We observe that while average export intensity increased significantly, it is the most pronounced for Emerging South and not so much for the Rest of South countries. We also see a high variation in the degree of average export intensity with a standard deviation of 0.14 across countries. Table 2 shows the summary statistics of the variables used in the regression analysis. Out of 130 countries, which recorded at least one IMF program, the top three countries with the longest duration of an IMF program presence are Malawi, Mali and Mauritania, which had an IMF program in 30 out of 35 years between 1980 and 2014. The highest number of cumulative conditions were in Romania (1,271), Pakistan (1,166) and Mauritania (1,080).

<Insert Figure 4 Here>

<Insert Table 2 Here>

⁵ Rest of South are developing countries excluding the Emerging markets. Full list is in the Appendix.

3.2. Empirical specification

We examine the effects of IMF conditionality requirements on trade structure in a simultaneous equation framework in Equations (1)-(3) to account for the endogeneity of IMF program participation and IMF conditionality, similar to Stubbs et al. (2020). Because we are interested in the effects of both IMF program participation and conditionality, we include them both here.

$$IMFProg_{it-1} = \alpha_1 X_{it-1} + \alpha_2 Z_{it-1} + \mu_{1i} + \delta_{1t} + \varepsilon_{1it} \quad (1)$$

$$IMFCOND_{it-1} = \gamma_1 X_{it-1} + \gamma_2 Y_{it-1} + \mu_{2i} + \delta_{2t} + \varepsilon_{2it} \quad (2)$$

$$Intensity_{it} = \beta_1 IMFProg_{it-1} + \beta_2 IMFCOND_{it-1} + \beta_3 V_{it-1} + \mu_{3i} + \delta_{3t} + \varepsilon_{3it} \quad (3)$$

where i is country and t is year. X_{it} and V_{it} are vectors of control variables and Z_{it} and Y_{it} are excludable instruments, which are discussed below. $[\mu_{1i}, \mu_{2i}, \mu_{3i}]$ and $[\delta_{1t}, \delta_{2t}, \delta_{3t}]$ are country and year fixed effects to control for unobserved country and time specific factors that affect IMF program participation and conditionality requirements, as well as export sophistication. The error terms, ε_{1it} , ε_{2it} , ε_{3it} , are assumed to be jointly normally distributed. All control variables are lagged by one period to reduce the likelihood of contemporaneous correlation and to account for delayed effects. Eqs. (1)-(2) account for the endogeneity of selection into IMF programs, and the endogeneity of IMF conditions in countries that are selected into IMF programs.

$IMFProg$ is a dummy variable, which is equal to 1 if country i has an existing IMF program in place for at least 5 months in a given year (Dreher, 2006). It controls for the endogeneity of being selected into an IMF program.

$IMFCond$ is a vector of total number of times IMF conditions are present in country i and year t . In the benchmark analysis we use a compositive variable, counting the number of binding conditions (i.e., hard conditions) under an IMF program and include both structural and quantitative conditions. In the robustness analysis we also break it down into various subcomponent.

Intensity_{it} is the technology-and-skill intensity of exports, calculated as the weighted average of the percentage share of each group of exports in total exports. It ranges between zero and one with higher values representing increased export sophistication.

X is a vector of country and year variant factors from World Bank (2022) (unless stated otherwise), including the following:

RGDPG is the real GDP growth (constant 2011 national prices in mil. 2011US\$) from PWT 9.1. and controls for the effect of economic growth on the probability of signing an IMF agreement and the number of IMF conditions. Growth slowdowns and recessions are significant predictors of a country signing an IMF agreement.

RGDPPC is real GDP per capita (chained PPPs in mil. 2011US\$) from PWT 9.1. It controls for the effect of average income on IMF program participation and the number of conditions. Because income levels are highly correlated with political power, and also share in IMF quotas (which determine countries' voting power), we expect higher income countries to have a lower likelihood to borrow from the IMF, and when they do, have more lenient (i.e., fewer number of) conditions.

CA is the current account balance as a percentage of GDP. Current account imbalances signal balance of payments problems and increase the likelihood of signing an IMF agreement and the number of conditions.

Fiscal is the percentage share of general government final expenditures in GDP. Fiscal imbalances affect both the likelihood of IMF agreements and the number of IMF conditions.

Inflation is consumer inflation. Increasing inflation rates signal the signing of IMF agreements and also the number of conditions.

V includes an additional set of control variables that are expected to affect the level of technology-and-skill intensity of a country's exports, including the following:

Pop is the (log) level of total population (millions, PWT9.1). We expect population to have a positive effect as it allows economies of scale and a larger supply of labor force.

Openness is trade openness, measured by the (log) percentage share of exports and imports in GDP and helps control for the effect of trade openness on trade structure (Observatory of Economic Complexity, 2019). The expected sign is ambiguous here. Openness can encourage specialization, learning by exporting, and productivity growth. It can, however, crowd out domestic firms because of increased competition.

Credit is share of private credit by deposit money banks and other financial institutions in GDP (World Bank, 2021). It controls for the availability of external credit, which affects the complexity of production processes and the specialization patterns according to comparative advantage.

RER is annual average bilateral real exchange rate (an increase is a real depreciation) between country i and USA (PWT9.1). Increasing RER can increase profitability of traded goods and facilitate industrialization and industrial upgrading (Rodrik, 2008).

3.3. Estimation method

The endogeneity of IMF program participation is a well-known problem in the literature. The most common approach is to use a 2SLS/3SLS or GMM estimation with appropriate IVs, which fulfill both exclusion and relevance conditions. For the exclusion condition, the IVs should affect the technology-and-skill-intensity of exports only through the IMF program participation. For the relevance condition, the IVs should be causally related to the IMF program variables. Finding good IVs that fulfill both conditions is notoriously difficult. Previous studies mostly rely on political economy variables such as UN Security Council membership or UN General Assembly voting similarity with the US, which is the largest quota holder in the IMF (Barro and Lee, 2005; Dreher, 2006). However, as pointed out by Dreher et al. (2018) and Stubbs et al. (2020), using such IVs that rely on the

geopolitical importance or proximity of an IMF program recipient country assumes that the Local Average Treatment Effect (LATE) captures all IMF programs rather than only those that are politically conditioned. If IMF programs that are politically motivated are less effective in achieving the announced program goals, then those studies that find negative or insignificant effects provide no evidence of IMF program ineffectiveness. Instead, those results only reveal the ineffectiveness of politically motivated IMF programs. Furthermore, and as discussed by Bazzi and Clemens (2013), using IVs that are also used in other settings (i.e., aid and growth literature), raises doubts about the identification of a causal relationship. These issues are further aggravated given that we have two IMF variables here, one for program participation and another for the IMF conditions. As for those studies that use the GMM method, they rely on internal instruments, which are unlikely to fulfill the exclusion condition (Dreher et al., 2021). They are also likely to suffer from the weak instrument problem (Bazzi and Clemens, 2023). Moreover, both the difference and system GMM approaches suffer from the criticism of being a black box where the results are highly sensitive to the IV lag length as well as the validity of the exclusion and relevance criteria (Roodman, 2009; Bazzi and Clemens, 2023). Also, these methods are shown to be more suitable for short panels, which is not the case here.

Consequently, while there is no perfect method to estimate Eqs. (1)-(3) and that each has its own limitations, following Stubbs et al. (2020), we side with an IV approach and estimate the system of equations in (1)-(3) simultaneously by the conditional (recursive) mixed process estimator (CMP).⁶ CMP is a limited information maximum likelihood estimator, which, with appropriate instruments, allows for the construction of a recursive set of equations, as in a 2SLS, that are used to consistently estimate the structural coefficient estimates in the final stage (Roodman, 2011). In Monte Carlo simulations, Stubbs et al. (2020) find that this approach is superior to other methods, including the

⁶ The estimations are done in Stata 14.2 using the “cmp” command by Roodman (2011).

OLS, two-step Heckman method, and 2SLS.

As discussed earlier, the biggest challenge in estimating Eqs. (1)-(3) is to find instruments that are correlated with the number of conditions and the program participation but not the export structure. Following Stubbs et al. (2020) and Lang (2021) and building on the aid effectiveness literature (Nunn and Qian, 2014; Dreher and Langlotz, 2020; Dreher et al., 2021), we rely on a compound IV approach. Accordingly, for the IMF program participation, we use Z ($intIMF$), which is the interaction of the within-country average of IMF program participation and IMF's budget constraint in year t ($IMFBudget_t$). The IMF budget constraint here is equal to the (log) liquid resources of the IMF (i.e., usable currencies plus Special Drawing Rights contributed) divided by liquid liabilities (total of members' reserve tranche positions plus outstanding IMF borrowing from members).⁷ Thus, $Z = \overline{IMFProg}_i \times IMFBudget_t$. The second compound IV, Y ($intBA2TOT$), accounts for the endogeneity of IMF conditionality and is measured by the interaction of the within-country average number of conditions during the full period and the IMF budget constraint in year t . Thus, $Y = \overline{IMFCond}_i \times IMFBudget_t$

Stubbs et al. (2020) show that these two variables serve as strong IVs for both Eq. (1) and (2), fulfilling both the relevance and exclusion conditions, and that we can take the IMF budget constraint as exogenous. For both IVs, we assume that changes in IMF budget constraint affect the incidence of IMF participation and the number of IMF conditions similarly across countries. These IVs satisfy the relevance condition given that cross-country average of IMF program participation and number of

⁷ IMF liquidity ratio equals liquid resources (usable currencies plus Special Drawing Rights contributed) divided by liquid liabilities (total of members' reserve tranche positions plus outstanding IMF borrowing from members) (Lang, 2021). We updated the data from Lang (2021) using IMF annual financial statements for 2006-2014 given discrepancies between the two for this period.

conditions can be causally related to the propensity of a particular country being under an IMF program and its number of policy conditions, after controlling for other observable determinants. We also know that the number of IMF program conditions is an increasing function of demand for IMF loans from member states (Dreher and Vaubel, 2004). Furthermore, IMF budget constraint is shown to be a significant predictor of IMF programs, reducing the number of conditions when the constraint is relaxed (Lang, 2021). Stubbs et al. (2020) also show that the average number of IMF conditions per country and the IMF budget constraint is significantly correlated.

These IVs also satisfy the excludability condition given that changes in IMF program participation or conditionality beyond the period averages are likely to result from exogenous and systemic changes in IMF policies.⁸ Furthermore, IMF budget constraint is not likely to have any direct effect on our outcome variable, export sophistication, other than its effect on the IMF program participation and conditions. IMF budget constraint is also not likely to be affected by the demand for IMF programs as the IMF resource pool is determined by financial commitments of member states, which are fixed exogenously and restricted by the quota allocation in the Fund. Because we directly control for the effects of the probability of having an IMF program and the number of IMF program conditions, we can treat their interactions with an exogenous variable as exogenous under not too strict conditions (Nizalova and Murtazashvili, 2016; Bun and Harrison, 2019; Stubbs et al., 2020). In other words, our identification strategy assumes that export structures of countries with different likelihoods of having an IMF program and IMF conditions are not affected differentially by variations in IMF budget constraint, except for the effects of the IMF programs and program conditions. This is the same idea as in a difference-in-difference setting where identification is based on the exogenous

⁸ Cornier and Manger (2021) also show that exogenous changes in internal research and policy priorities significantly affect IMF policy conditions.

treatment and the lack of pre-treatment trends across countries. Following Stubbs et al. (2020) and Dreher et al. (2021) we also compared the evolution of the *Intensity* variable for those countries below and above the mean number of conditions and found similar trends for both groups (Figure 5).⁹

<Insert Figure 5 here>

We should note that we use annual data rather than period averages over four or five years. This is similar to the approach taken by Dreher et al. (2021) and is mostly conditioned by the small sample size, which limits the power of statistical tests in case of averaged data. This approach means we are examining the effects of IMF programs in the short run. However, despite a smaller sample size, we also experimented with longer lags and five-year averages to explore medium and long run effects in the robustness analysis. For comparison and robustness purposes we also estimate Eq. (3) using the fixed effects, 2SLS, and system GMM methods. To minimize the endogeneity concerns, we experimented with two versions. First, similar to Dreher et al. (2021), a barebones version with only (log) population and year and country fixed effects as exogenous variables and the IMF program

⁹ We should note that these instruments are used in previous research with different dependent variables, particularly inequality, bureaucratic quality, and public education spending. As discussed by Bazzi and Clemens (2013), this may cause an identification problem and violate the exclusion restriction. However, given the three equation set up and the additional control variables in each equation as well as the annual structure of the estimation, we have a sufficiently general model to estimate. Moreover, we do not expect inequality, bureaucratic quality, or public education spending to affect trade structure in the short run. We further tested the presence of any direct effect of income inequality (measured by gini coefficient from World Bank), bureaucratic quality (measured by the average ICRG score) and government education spending to GDP ratio (from World Bank) on our outcome variable separately using one year lag, year and country fixed effects, total population, and with and without IMF program and conditions variables and found no significant effect.

participation and conditions as endogenous variables, instrumented by *intIMF intBA2TOT*. Second, we included a full set of control variables.¹⁰

4. Empirical results

We present regression results in columns (1)-(7) of Table 3 where columns (1)-(2) are the OLS results, (3)-(4) are 2SLS results, (5) is the system GMM, and (6)-(7) are the CMP results (the first stage results are reported in the Appendix Table A1). We show the barebones version as in Dreher et al. (2021) including only total population and country- and year-fixed effects (from Eq. (3)) in columns (1), (3) and (6) and a full version in columns (2), (4), (5) and (7). Column (5) is a dynamic specification and includes an (unreported) lagged dependent variable among its regressors, and unlike 2SLS and CMP methods, relies fully on internal instruments. Column (7) is our benchmark specification. Overall, we find consistent results: independent of specification or estimation method, we find no significant effect of IMF program participation or the total number of binding IMF conditions, including both structural and quantitative, on *Intensity*.

<Insert Table 3 Here>

As for other variables of interest, we find that trade openness has a significantly positive effect, possibly highlighting the importance of competition and scale effects. Consistent with literature, credit to GDP ratio also appears to have a positive effect on export sophistication. Real effective exchange rate is found with a negative effect, suggesting an inverse relationship between real exchange rate depreciation and export sophistication.

The standard diagnostic tests do not reject our identification strategy and support the choice of IVs. For the 2SLS estimation, we report F-test of excluded instruments, Sanderson-Windmeijer

¹⁰ In the GMM estimation, we used the *xtabond2* routine, written by David Roodman. To avoid the problem of too many instruments, we used the ‘collapse’ option (Roodman, 2009).

(SW) first-stage chi-squared (the null is that the endogenous regressor is unidentified) and Sanderson-Windmeijer (SW) first-stage F statistics (the null is that endogenous regressor is weakly identified). For the GMM estimation, we report the AR(2) test and the Hansen's J-statistics. Lastly, for the CMP estimation, we present the Kleibergen-Paap F-statistics for the compound instruments and their joint significance.¹¹

4.1. Addressing heterogeneity of IMF conditionality requirements

The IMF conditions come in all shapes and sizes and there is high heterogeneity in the number and type of conditions across countries and years. As argued by Rickard and Caraway (2019), different conditions may have different effects on the same target. Thus, in Table 4 we examine various composite measures of IMF conditions using the benchmark specification of column (7) in Table 3 (full results including the first stage are reported in the Appendix Tables A2-A7). In column (1) we replace the *IMFConditions* variable with *BA1TOT*, which includes both soft (not-binding) and hard (binding) conditions in its total count. Column (2) adds *BA3TOT*, which is a weighted count version of *BA1TOT* and *BA2TOT* where hard conditions are assigned a weight of 2 and soft conditions are assigned a weight of 1. In columns (3)-(6) we use implementation corrected versions of IMF conditionality requirements. While our main control variable counts only binding conditions, in some instances IMF's Executive Board can waive certain conditions for certain countries without a program suspension. Thus, in column (3) we use *iBATOT*, which is an implementation-corrected hard condition count where waived conditions are subtracted from total hard conditions.¹² In column (4),

¹¹ As a general rule, we expect the F-statistics to be greater than 10.

¹² Only hard conditions have data for waived conditions. Stone (2004) finds that enforcement of IMF conditions is subject to political influence from the US and former colonial powers in Africa. Therefore, netting

we use $dBA1TOT$, which is implementation-discounted simple condition count. In calculating $dBA1TOT$, the number of conditions is discounted by the number of quarters interrupted in a given year within an IMF program. Program interruptions often result from a country's failure to complete an IMF review. In column (5) we have $dBA2TOT$, which is implementation-discounted hard condition count. Column (6) includes $dBA3TOT$, which is implementation-discounted weighted condition count (as before, hard conditions are assigned a weight of 2 and soft conditions a weight of 1). We should also note that because data for waivers are not available after 2008, our sample size is reduced. Overall, across every specification in columns (1)-(6) IMF programs are associated with a negative but statistically insignificant effect on export sophistication. Furthermore, IMF conditionality requirements remain insignificant in all columns except for column (4) where it becomes significant but only at the 10% level.

<Insert Table 4 Here>

Next, in Table 5 we separate IMF conditions into quantitative conditions and structural conditions, which were summarized in Table 1. For space considerations we report results using only our benchmark specification, column (7) from Table 2, but report the rest in Appendix Tables A8-A14. The quantitative conditions include total quantitative conditions (QCs), quantitative performance criteria (QPCs) and indicative benchmarks (IBs)). Likewise, structural conditions include total structural conditions (SCs), prior actions (PAs), structural performance criteria (SPCs), and structural benchmarks (SBs). The results in Table 5 reveal that IMF programs and conditions have no detectable effect on trade structure. These results are robust to all other estimation methods.

<Insert Table 5 Here>

out the waivers together with controlling for endogeneity and the UN security council membership and General Assembly voting behavior might help correct for this bias.

In Tables 6 and 7 we examine each of 13 sub-conditionality groups separately (full results are reported in Appendix Tables A15-A28). This exercise also allows us to test whether some conditions are more effective in stimulating export sophistication. For example, institutional reforms, SOE privatization, external sector reforms, or financial sector reforms could be more influential than social policy reforms. However, we need to make sure that the left-out or residual conditions are not driving our results, causing an omitted variable bias. Therefore, following Stubbs et al. (2020), we include each of 12 groups of IMF conditions together with the residual conditions that are excluded in each policy area. Similar to the aggregate conditions, we create compound instruments for each policy conditions and the residuals using the interaction of the within-country average of the conditions, the residual conditions and the annual IMF budget constraint.

<Insert Table 6 & 7 Here>

Column (1) in Table 6 shows the effects of structural and quantitative number of conditions, separated using an alternative disaggregation method. Briefly, the structural conditions are equal to the sum of total number of structural performance criteria (*SPCsTOT*) and prior actions (*PAsTOT*), and quantitative conditions are equal to the total number of quantitative performance criteria (*QPCsTOT*). Columns (2)-(7) include total number of (implementation uncorrected) hard conditions (*BA2*) for: fiscal issues (*FP*), revenues and tax issues (*RTP*), financial sector, monetary policy and Central Bank issues (*FIN*), SOE reform and pricing (*SOE*), privatization (*PRI*), and external debt issues (*DEB*). Columns (8)-(14) in Table 7 presents the remaining conditions for external sector (*EXT*), labor issues (*LAB*), social policy (*SP*), redistributive policies (*POV*), institutional reforms (*INS*), land and environment (*ENV*), and the residual category (*OTH*), respectively. In none of the specifications, except for column (7), either the IMF condition in question, or the remaining residual conditions have any significant or robust effect on trade structure. This is true for all other estimation

methods reported in Appendix Tables A15-A28.¹³ In contrast, the presence of an IMF program appears to have a negative but statistically insignificant effect on trade structure in 13 of 14 specifications.

4.2. Alternative measures of export sophistication

Are these results sensitive to the definition of export sophistication? To examine this question, we employ three alternative definitions of trade structure. First, we adopt the OECD (2011) as an alternative measure of export sophistication, which groups manufacturing industries into four categories based on their R&D intensities: high-technology, medium high-technology, medium low-technology, and low-technology.¹⁴ We classified all other products under “others,” which are mainly primary products. Once we have the products classified accordingly, we calculated the intensity index using the same methodology as before whereby it is in the range of [0, 1] with higher numbers indicating higher skill intensity.

Second, we use the Economic Complexity Index (ECI) from the Observatory of Economic Complexity (2021). The ECI measures the sophistication of a country’s productive structure by combining information on the diversity of a country’s exports (the number of products it exports), and the ubiquity of its products (the number of countries that export that product) (Hidalgo and Hausmann, 2009). If ECI captures “the composition of a country’s productive output” and “the structures that emerge to hold and combine knowledge”, it can be used as a proxy for the productive capabilities of a given country (Observatory of Economic Complexity, 2021). The intuition behind ECI is that sophisticated economies are diverse and export products that, on average, have low

¹³ *DEB* conditions appeared with a negative and significant coefficient in the fixed effects and CMP-Full estimations. Also, *EXT* conditions appeared with a positive and significant effect in fixed effects results (Appendix Tables A21-A22).

¹⁴ The Appendix A provides further details on the OECD (2011) measure.

ubiquity, because only a few diverse countries can make these sophisticated products. By the same token, less sophisticated economies are expected to produce a few ubiquitous products. ECI exploits this variation in the diversity of countries and the ubiquity of products to create a measure of a country's productive structure that incorporates information about the sophistication of products. ECI is calculated from exports data connecting countries to the products in which they have revealed comparative advantages (Hidalgo and Hausmann, 2009).

Third, we use the Herfindahl-Hirschman index for export market diversification, which is the sum of squared shares of a given destination in the total exports of a given country. It ranges between zero and one, with the latter representing the highest concentration where all goods are exported to only one destination. We use the IMF's direction of trade statistics for merchandise goods export values due to its broader coverage. If IMF programs and IMF conditions were conducive to skills upgrading and increased exports sophistication, we should expect countries to diversify their exports across destinations, causing a decrease in export concentration.

Table 8 shows the results from this exercise for the IMF program and conditionality variables, replicating Table 3 (full results including the first stage are reported in the Appendix Tables A29-A31). The correlation coefficient between *Intensity* and these three variables are 0.83 (*Intensity*^{OECD}), 0.77 (*ECI*) and -0.03 (*Herfindahl*).¹⁵ The results from all three measures of export sophistication are consistent with our earlier results. First, we find no significant or robust effect of IMF programs or IMF conditions on OECD based intensity measure or the economic complexity index. When the effect is significant, it is negative as is the case with the effect of IMF programs in columns (4) and (7). As to the export concentration, we find similar results with mostly insignificant coefficient estimates except for column (6) where we detect a positive effect of IMF program presence on export concentration. However, this effect is not robust, or significant in any other specification.

¹⁵ We should note that ECI is available for a smaller set of sample countries.

<Insert Table 8 Here>

5. Sensitivity analysis

To confirm the robustness of our previous findings, we conduct a rich set of sensitivity tests. First, we examine the long-term effects of IMF programs and conditions on export intensity using five-year averages, both one period lagged and contemporaneous. The results in Appendix Table A32-A33 support previous findings as we detect no significant effect of IMF programs or conditions on export structure either in a contemporaneous or one-period lagged window where we use five-year period averages for all variables. Next, we replaced the *intensity* variable with its forward values for years one to nine, which analyses the lagged effects of IMF programs and conditions up to 10 years (given that they are already lagged by one year). The results suggest no significant or robust effect of either IMF programs or IMF conditions (Appendix Table A34-A35).

Second, previous research highlights the importance of political affiliation between IMF members and its main shareholders. Particularly, the national interests of the U.S. play a major role in IMF's decisions to extend a loan to a member state (Stone, 2004; Dreher et al., 2009a, 2009b; Eichengreen and Woods, 2016). Despite the well-known issues with this approach, which are discussed earlier in section 3.3, we include two additional variables as our IVs to control for the effect of relationship with the largest IMF quota holder, the US, and other economic and political power centers (Dreher et al., 2009a, 2009b). *PctAgreeUS* is Lijphart's index of agreement between a UN member state and the U.S. in a given year (Bailey et al., 2017). It is equal to 1 if a state always agrees with the U.S, 0 if it always votes the other way. If one state votes yes and the other abstains, the vote is coded as 0.5. *UNSC* is a dummy variable equaling one when a country is a temporary member in the United Nations Security Council (Dreher et al., 2009b). We expect both variables to have a positive effect on the likelihood of a country being admitted to an IMF program, and a negative effect on the stringency of IMF conditions, resulting in fewer policy conditions. The results in Appendix Table A36

suggest that the presence of an IMF agreement or the number of conditions do not have any effect on the trade structure.

Third, we checked for sample selection effects and excluded the former Soviet Union, Warsaw Pact countries and Yugoslavia from the sample given their unique circumstances. Also, the IMF programs in these economies were heavily influenced by the politics of the end of Cold War and therefore may bias our results (Appendix Table A37). Fourth, we dropped one World Bank geographical region (East Asia and Pacific, Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, South Asia, and Sub-Saharan Africa) at a time to rule out the possibility that the results are affected by regional heterogeneity (Appendix Tables A38-A44). Fifth, we dropped the top and bottom one percentiles of the sample based on the skill intensity of exports (*Intensity*) (Appendix Table A45). Sixth, we examined the sensitivity of our findings to the heavy users of IMF agreements by dropping those above the 99th percentile of the sample based on the average number of years a country was under an IMF program (0.848), and the average number of IMF conditions per year (25.143) (Appendix Table A46). Seventh, we explored if the effect of IMF programs is different across different income groups among developing countries (note that less than 8% of all IMF conditions in the sample are from high-income countries). The use of fixed effects mostly accounts for such country specific factors in our specification. However, we still divided the sample of developing countries into three groups, low income, lower middle-income, higher middle-income, based on World Bank classifications and repeated Table 3 for each group separately (Appendix Tables A47-49). After all these checks, all our results remained intact.

6. Conclusion

The IMF programs and policy conditionalities, despite decades of experimentation in over 130 countries have left a lot to be desired in terms of growth and development effects. In this paper we contribute to this debate by examining the effects of IMF programs and conditionality requirements

on trade structure. This is an interesting question as the technology-and-skills upgrading of a country's productive capabilities is a major driver of long run development and growth, which are among the IMF's main stated goals. Overall, we did not find any evidence of a significant or robust effect of IMF programs or conditionality requirements on export sophistication, economic complexity, or export diversification. This finding appears to be true both in the short run and long run.

Our findings raise questions about the effectiveness of IMF programs for long run development and growth and whether the IMF is serious about its mission to support development of productive resources and sustainable growth in member countries. If these programs do not affect productive capabilities or economic complexity, which are crucial for long run structural change, then what do they do? Why does the IMF insist on implementation of programs that are shown to be ineffective in stimulating long run development and growth? In fact, the Executive Directors' own latest assessment of IMF's programs and conditionality requirements admitted that IMF's "growth assumptions were often too optimistic," driven by "forecasting errors and the underestimation of the impact of policy adjustment and overestimation of structural reform payoffs" IMF, 2019b: 4). As a solution, the Directors asked to "increase the scrutiny of baseline assumptions, deepen the discussion of risk scenarios, and improve contingency planning in program design" (p.4). However, one should only be cautiously optimistic here as the IMF does not provide any specific discussion of what more realistic baseline assumptions, models or cost and benefit analysis would look like. In fact, instead of increasing the 'scrutiny of baseline assumptions' and "program design," the IMF's solution to the disappointing growth effects is to require "a longer period of program engagement" for deeper structural reforms, which would "diversify the economy" (IMF, 2019b, p.39). Recent IMF research also suggests more of the same by recommending even more comprehensive reform packages and promising long-term benefits without acknowledging any fault in the reforms themselves (Andritzky, et al., 2021). Furthermore, the IMF research department appears to have a very limited interest in

examining the developmental benefits of its reform programs beyond some very narrowly defined short term benchmarks. All these issues raise questions as to why host countries are still expected to spend significant amounts of resources to implement these policies. Should they simply put their faith in them? These are some of the questions that we hope future research will provide some answers to.

There are also some caveats to our research. First, as discussed earlier, our measure of conditionality requirements is not perfect. Particularly, the number of IMF conditions does not capture the full scope, depth, and burden of program implementation as each policy area requires different types of resources and capabilities. The financial cost of implementation is also likely to be uneven and non-linear across different policy areas. Lastly, the IMF programs are highly heterogeneous in type, length and stringency and are expected to suffer from a fallacy of composition when lumped together. We hope future empirical research will address these questions further.

References

- Abouharb, M. Rodwan, Cingranelli, David, 2007. *Human Rights and Structural Adjustment*. Cambridge University Press, Cambridge.
- Amsden, Alice, 1989. *Asia's Next Giant: South Korea and Late Industrialization*. Oxford: Oxford University Press.
- An, Galina, Iyigun, Murat F., 2004. The export skill content, learning by exporting and economic growth. *Economics Letters* 84, 29-34.
- Andritzky, Jochen, Kang, Ke, Munkacsi, Zsuzsa, 2021. How to gain the most from structural conditionality of IMF-supported programs. Working Paper WP/21/139, IMF, Washington, D.C.
- Babb, Sarah, L., Kentikelenis, Alexander E., 2018. International financial institutions as agents of neoliberalism. In Cahill, Damien, Cooper, Melinda, Konings, Martijn, Primrose, David (Eds.), *The SAGE Handbook of Neoliberalism*. SAGE Publications, Thousand Oaks, pp. 16–27.
- Bailey, Michael A., Strezhnev, Anton, Voeten, Erik, 2017. Estimating dynamic state preferences from UN voting data. *Journal of Conflict Resolution* 61(2), 430-456.
- Barro, Robert J., Lee, Jong-Wha, 2005. IMF programs: who is chosen and what are the effects? *Journal of Monetary Economics* 52(7), 1245-1269.
- Bazzi, Samuel, Clemens, Michael A., 2013. Blunt instruments: Avoiding common pitfalls in identifying the causes of economic growth. *American Economic Journal: Macroeconomics* 5(2), 152-86.
- Boughton, James M., 2012. *Tearing Down Walls. The International Monetary Fund 1990-1999*. IMF, Washington D.C.
- Brune, Nancy, Garrett, Geoffrey, Kogut, Bruce, 2004. The international monetary fund and the global spread of privatization. *IMF Staff Papers* 51(2), 195-219.
- Bumann, Silke, Hermes, Niels, Lensink, Robert, 2013. *Financial liberalization and economic*

growth: A meta-analysis, *Journal of International Money and Finance* 33, 255-281.

Bun, Maurice J.G., Harrison, Teresa D. (2019). OLS and IV estimation of regression models including endogenous interaction terms. *Econometric Reviews* 38(7), 814-827.

Bustos, Sebastian, Gomez, C., Hausmann, Ricardo, Hidalgo, Cesar A. 2012. The dynamics of nestedness predicts the evolution of industrial ecosystems. *PLoS one* 7(11), e49393.

Butkiewicz, James L., Yanikkaya, Halit, 2005. The effects of IMF and World Bank lending on long-run economic growth: An empirical analysis. *World Development* 33(3), 371-391.

Cadot, Oliver, Carrre, Celine, and Strauss-Kahn, Vanessa, 2011. Export diversification: What's behind the hump? *Review of Economics and Statistics* 93(2), 590-605.

Casper, Brett A. 2017. IMF programs and the risk of a coup d'état. *Journal of Conflict Resolution* 61(5), 964-996.

Cormier, Ben, Manger, Mark S., 2021. Power, ideas, and World Bank conditionality. *Review of International Organizations* 1-29.

Demir, Firat, Razmi, Arslan, 2021. The real exchange rate and development: Theory, evidence, issues, and challenges. *Journal of Economic Surveys* 36(2), 386-428.

Dreher, Axel, 2006. IMF and economic growth: the effects of programs, loans, and compliance with conditionality. *World Development* 34(5), 769-788.

Dreher, Axel, Langlotz, Sarah, 2020. Aid and growth: New evidence using an excludable instrument. *Canadian Journal of Economics* 53(3), 1162-1198.

Dreher, Axel, Eichenauer, Vera Z., Gehring, Kai, 2018. Geopolitics, aid, and growth: The impact of UN security council membership on the effectiveness of aid. *World Bank Economic Review* 32(2), 268–286.

Dreher, Axel, Vaubel, Roland, 2004. The causes and consequences of IMF conditionality. *Emerging Markets Finance and Trade* 40(3), 26–54.

Dreher, Axel, and Walter, Stefanie, 2010. Does the IMF help or hurt? The effect of IMF programs on the likelihood and outcome of currency crises. *World Development* 38, 1-18.

Dreher, Axel, Sturm, Jan-Egbert, Vreeland, James R. 2009a. Global horse trading: IMF loans for votes in the United Nations security council. *European Economic Review* 53(7), 742-757.

Dreher, Axel, Sturm, Jan-Egbert, Vreeland, James R. 2009b. Development aid and international politics: Does membership on the UN Security Council influence World Bank decisions? *Journal of Development Economics* 88, 1-18. Updated March 2019.

Dreher, Axel, Sturm, Jan-Egbert, Vreeland, James R., 2015. Politics and IMF conditionality. *Journal of Conflict Resolution* 59(1), 120–148.

Dreher, Axel, Fuchs, Andreas, Parks, Bradley, Strange, Austin, Tierney, Michael J., 2021. Aid, China, and growth: Evidence from a new global development finance dataset. *American Economic Journal: Economic Policy*, 13(2), 135-74.

Easterly, William, 2005. What did structural adjustment adjust? The association of policies and growth with repeated IMF and World Bank adjustment loans. *Journal of Development Economics* 76, 1-22.

Eichengreen, Barry, Woods, Ngaire, 2016. The IMF's unmet challenges. *Journal of Economic Perspectives* 30(1), 29-52.

Forster, Timon, Kentikelenis, Alexander E., Reinsberg, Bernhard, Stubbs, Thomas H., King, Lawrence P., 2019. How structural adjustment programs affect inequality: A disaggregated analysis of IMF conditionality, 1980-2014. *Social Science Research* 80, 83-113.

Gabel, Ilene, 2011. Not your grandfather's IMF: Global crisis, 'productive incoherence' and developmental policy space. *Cambridge Journal of Economics* 35, 805-830.

Hausmann, Ricardo, Hwang, Jason, Rodrik, Dani, 2007. What you export matters. *Journal of Economic Growth* 12(1), 1-25.

Hidalgo, Cesar A., Hausmann, Ricardo, 2009. The building blocks of economic complexity. Proceedings of the National Academy of Sciences 106(26), 10570-10575.

Hidalgo, Cesar A., Klinger, Bailey, Barabasi, A-L., Hausman, Ricardo 2007. The Product Space Conditions the Development of Nations. Science 317(5837), 482-487.

Hirschman, Albert O., 1958. The Strategy of Economic Development. Yale University Press, New Haven.

Hodge, Graeme A., 2018. Privatization: An International Review of Performance. Routledge, New York.

Imbs, Jean, Wacziarg, Romain, 2003. Stages of diversification. American Economic Review 93(1), 63-86.

International Monetary Fund (IMF), 2002. Turkey: 2002 article IV consultation and first review under the stand-by arrangement-staff report; Staff Statement; Public Information Notice and News Brief on the Executive Board Discussion. International Monetary Fund. Washington D.C. <https://www.imf.org/en/Publications/CR/Issues/2016/12/30/Turkey-2002-Article-IV-Consultation-and-First-Review-Under-the-Stand-By-Arrangement-Staff-15925>

International Monetary Fund (IMF), 2010. Greece: Staff report on request for stand-by arrangement. IMF Country Report No. 10/110. International Monetary Fund. Washington D.C. <https://www.imf.org/external/pubs/ft/scr/2010/cr10110.pdf>

International Monetary Fund (IMF), 2017. International financial statistics. International Monetary Fund. Available at <https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b>

International Monetary Fund (IMF), 2019a. IMF conditionality. International Monetary Fund. Accessed on February 5, 2019. Available at: <https://www.imf.org/en/About/Factsheets/Sheets/2016/08/02/21/28/IMF-Conditionality>.

International Monetary Fund (IMF), 2019b. 2018 Review of Program Design and Conditionality. International Monetary Fund, Washington D.C.

International Monetary Fund (IMF), 2019c. Articles of Agreement of the International Monetary Fund. Accessed on March 15, 2019. Available at: <https://www.imf.org/external/pubs/ft/aa/index.htm>

International Monetary Fund (IMF), 2019d. IMF Lending. International Monetary Fund. Accessed on February 5, 2019. Available at: <https://www.imf.org/en/About/Factsheets/IMF-Lending>

Kaldor, Nicholas, 1966. Causes of the Slow Rate of Economic Growth of the United Kingdom. Cambridge: Cambridge University Press.

Kentikelenis, Alexander E., Stubbs, Thomas, King, Lawrence P., 2016. IMF conditionality and development policy space, 1985-2014. *Review of International Political Economy* 23, 543-582.

Kentikelenis, Alexander E., Stubbs, Thomas, King, Lawrence P., 2017. IMF Conditionality 1980-2014. Codebook and Uses of Data.

Lall, S. (2000). The technological structure and performance of developing country manufactured exports, 1985-1998. *Oxford Development Studies* 28(3), 337-370.

Lall, Sanjaya, 2001. Competitiveness, Technology and Skills. Edward Elgar, Cheltenham.

Lall, Sanjaya, Weiss, John, Zhang, Jinkang, 2006. The “sophistication” of exports: A new trade measure. *World Development* 34(2), 222-237.

Lang, Valentin, 2021. The economics of the democratic deficit: The effect of IMF programs on inequality. *The Review of International Organizations* 16(3), 599-623.

Lederman, Daniel, Maloney, William, 2012. *Does What You Export Matter?* World Bank, Washington D.C.

Levchenko, Andrei A., 2007. Institutional quality and international trade. *Review of Economic*

Studies 74(3), 791-819.

Myrdal, Gunnar, 1957. *Economic Theory and Underdeveloped Regions*. Duckworth, London.

Nizalova, Olena Y., Murtazashvili, Irina, 2016. Exogenous treatment and endogenous factor: Vanishing of omitted variable bias on the interaction term. *Journal of Econometric Methods* 5(1), 71–77.

Nunn, Nathan, Trefler, Daniel, 2014. Domestic institutions as a source of comparative advantage. In Gopinath, Gita, Helpman, Elhanan, Rogoff, Kenneth, *Handbook of International Economics*, Vol. 4, Elsevier, Amsterdam, pp. 263-315.

Nunn, Nathan, and Qian, Nancy, 2014. US food aid and civil conflict. *American Economic Review* 104(6), 1630-1666.

Observatory of Economic Complexity, 2019.

<https://oec.world/en/resources/methodology/>. Accessed 11/25/2019.

OECD, 2011. ISIC Rev. 3 Technology Intensity Definition. OECD Directorate for Science, Technology and Industry Economic Analysis and Statistics Division. OECD.

Ostry, Jonathan D., Loungani, Prakash, Furceri, Davide, 2016. Neoliberalism: Oversold? *Finance & Development*, 38-41. June, IMF.

Prasad, Eswar S., Rajan, Raghuram, Subramanian, Arvind, 2007. Foreign capital and economic growth. *Brookings Papers on Economic Activity* (1), 1-57.

Przeworski, Adam, Vreeland, James R., 2000. The effect of IMF programs on economic growth. *Journal of Development Economics* 62(2), 385-421.

Reinhart, Carmen M., Trebesch, Christoph, 2016. The International Monetary Fund: 70 Years of reinvention. *Journal of Economic Perspectives* 30(1), 3-28.

Rickard, Stephanie J., Caraway, Teri L., 2019. International demands for austerity: Examining the impact of the IMF on the public sector. *Review of International Organizations* 14: 35–57.

Rodrik, Dani, 2008. The Real exchange rate and economic growth. *Brookings Papers on Economic Activity*, 365-412.

Rodrik, Dani, 2016. Premature deindustrialization. *Journal of Economic Growth* 21(1), 1-33.

Rodríguez, Francisco, Rodrik, Dani, 2000. Trade policy and economic growth: A skeptic's guide to the cross-national evidence. In Bernanke, Ben, Rogoff, Kenneth (Eds.). *NBER Macroeconomics Annual*.

Rodrik, Dani, Subramanian, Arvind, 2009. Why did financial globalization disappoint? *IMF Staff Papers* 56(1), 112-138.

Roodman, David, 2009. A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics* 71, 135–158

Roodman, David, 2011. Fitting fully observed recursive mixed-process models with `cmp`. *Stata Journal* 11(2), 159-206.

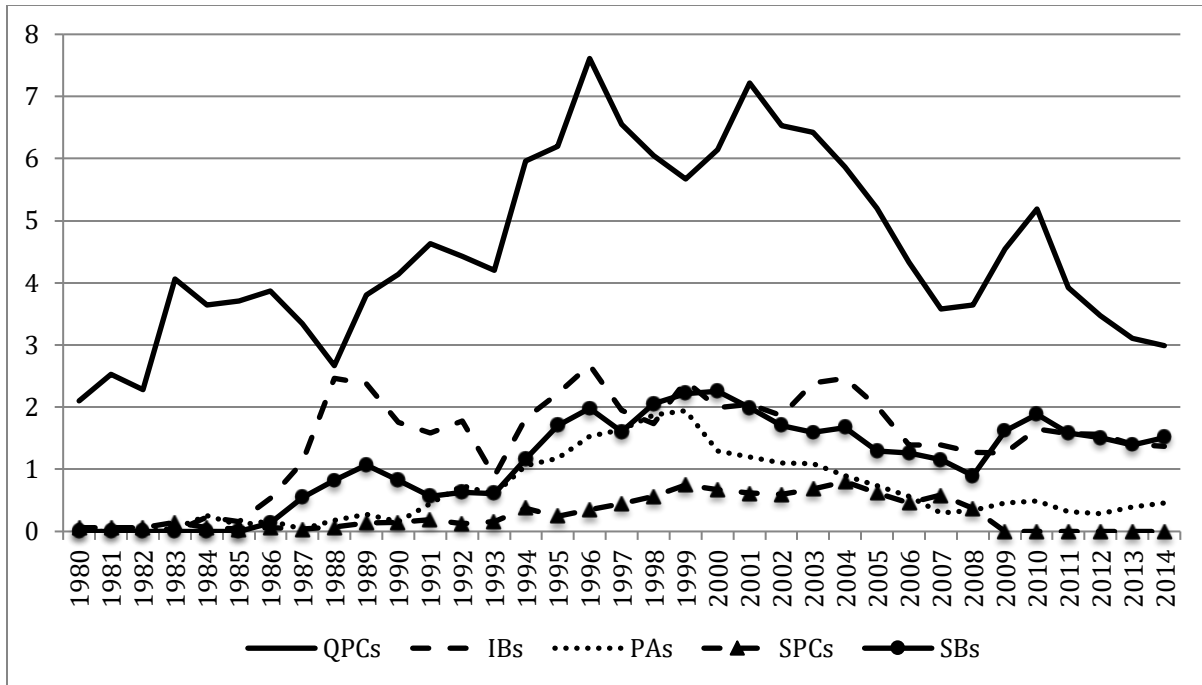
Sheng, Liugang, and Yang, Dennis T., 2016. Expanding export variety: The role of institutional reforms in developing countries. *Journal of Development Economics* 118, 45-58.

Stone, Randall W., 2004. The political economy of IMF lending in Africa. *American Political Science Review* 98(4), 577-591.

Stubbs, Thomas, Reinsberg, Bernhard, Kentikelenis, Alexander, King, Lawrence, 2020. How to evaluate the effects of IMF conditionality. An extension of quantitative approaches and an empirical application to public education spending. *Review of International Organizations* 15, 29-73.

World Bank (2022). *World Development Indicators*. World Bank. Accessed January 5. Available at: <https://databank.worldbank.org/source/world-development-indicators>

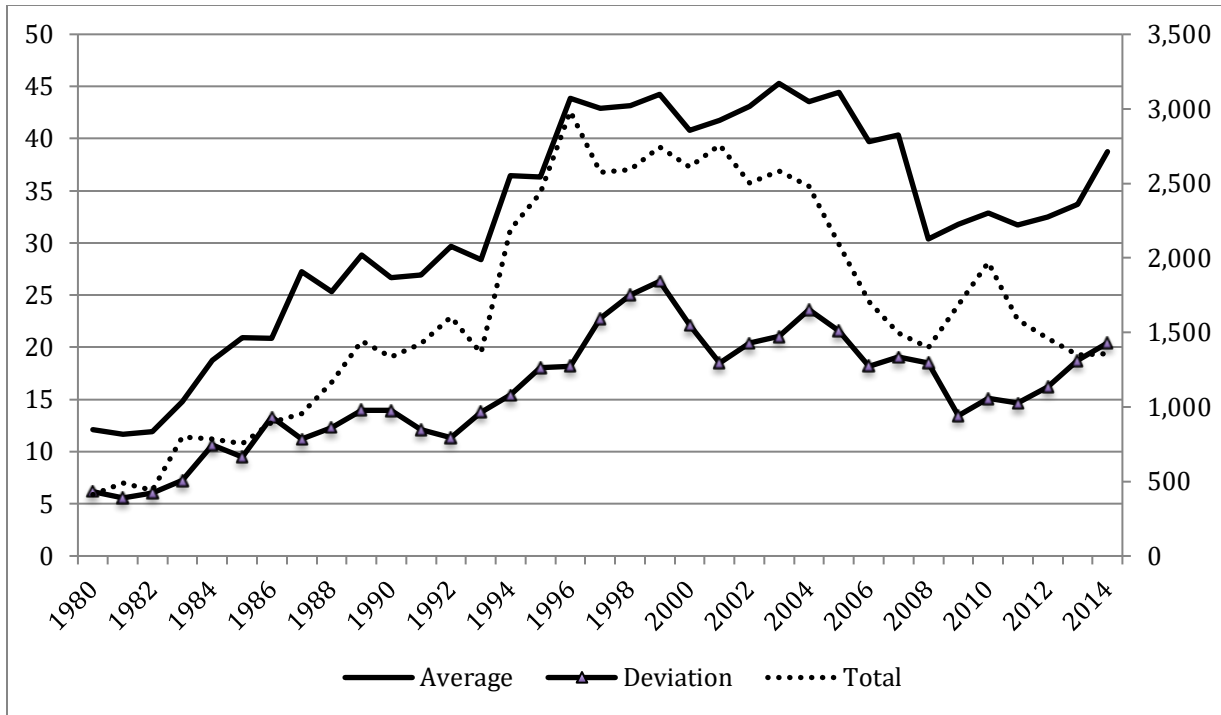
Figure 1: Changes in the structure of IMF conditions, 1980-2014



Notes: The y-axis is the average number of IMF conditions per country in a given year. *QPCs* is quantitative performance criteria, *IBs* is indicative benchmarks, *PAs* is prior actions, *SPCs* is structural performance criteria, and *SBs* is structural benchmarks.

Source: Author's calculations.

Figure 2: Changes in total and average number of conditions, 1980-2014

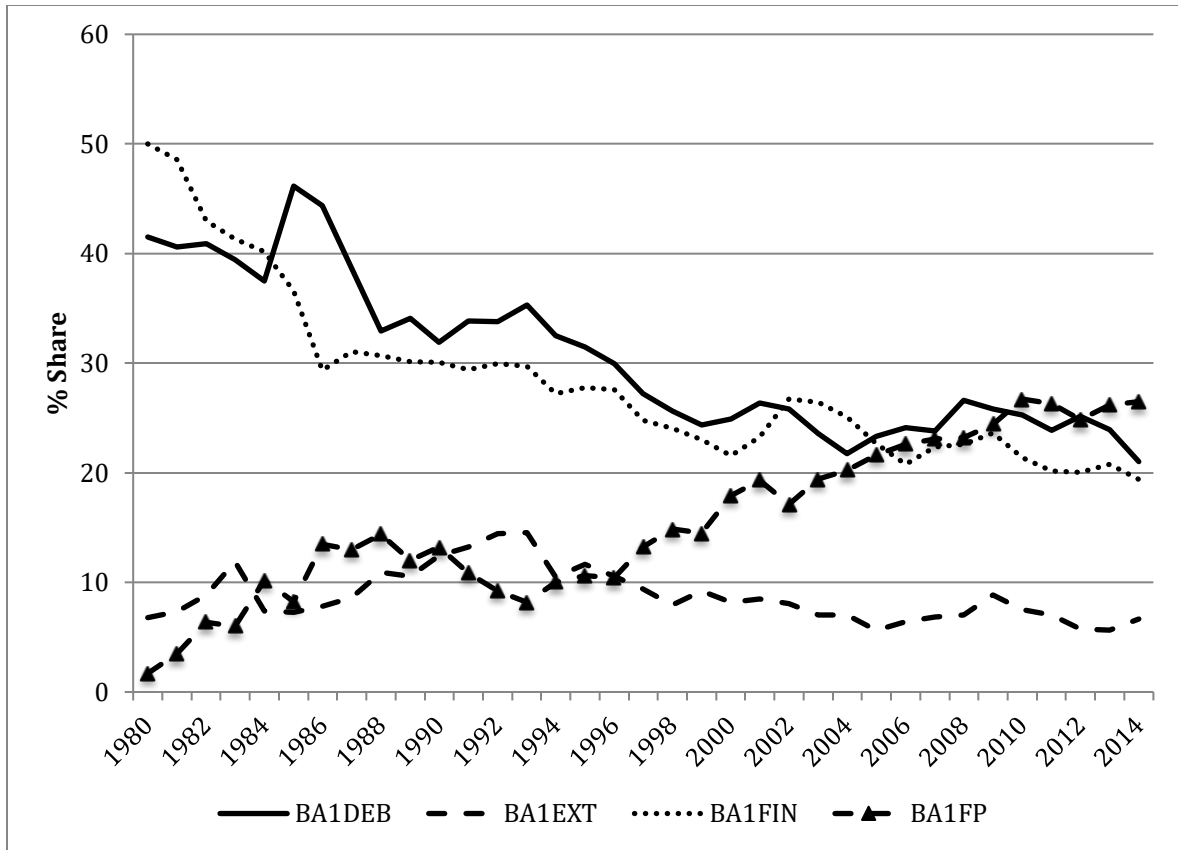


Notes: *Average* is the average number of IMF conditions in a given country in a given year (BA1TOT).

Deviation is the standard deviation of number of conditions per country in a given year. *Total* (right axis) is the total number of IMF conditions in all IMF program countries in a given year.

Source: Author's calculations.

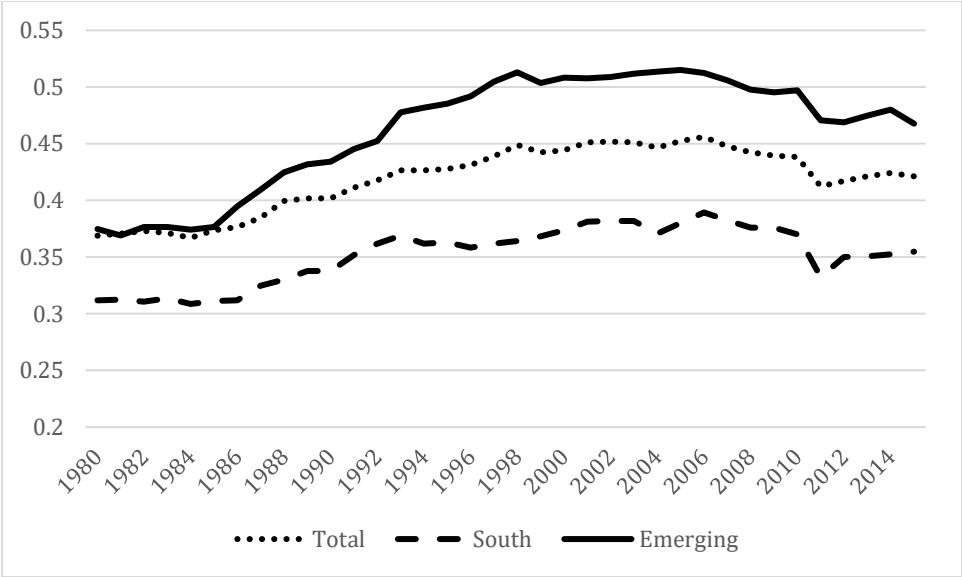
Figure 3: Percentage distribution of top four areas under IMF conditions, 1980-2014



Notes: Percentage share of top four conditionality requirements. *BA1DEB* is external debt issues, *BA1EXT* is external sector, *BA1FIN* is financial sector, monetary policy and Central Bank issues, *BA1FP* is fiscal issues.

Source: Author's calculations.

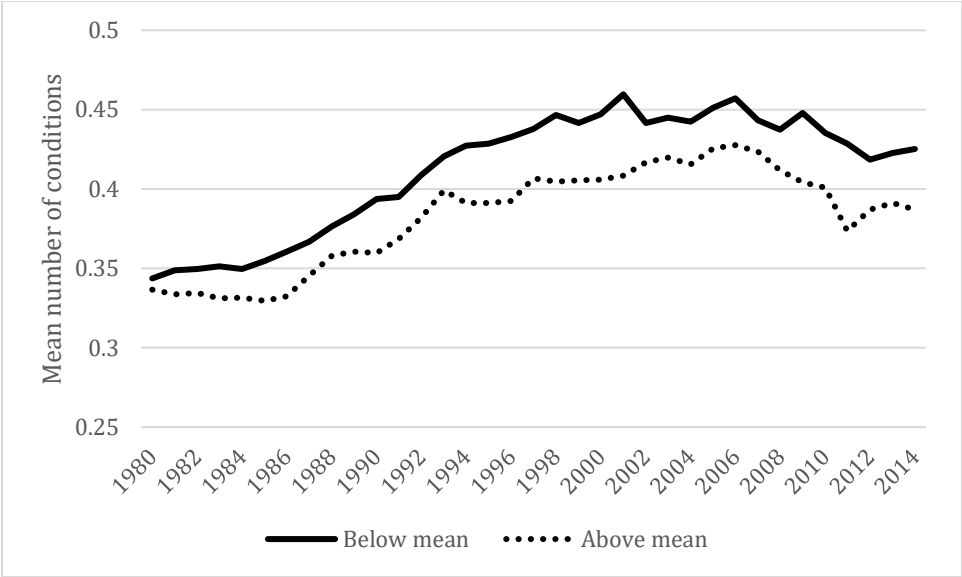
Figure 4: Changes in export sophistication over time, 1980-2014



Notes: *Total* refers to the average level of Intensity in the full sample. *South* and *Emerging* refers to the average Intensity in Rest of the South and Emerging South countries.

Source: Author’s calculations.

Figure 5: Trends in IMF conditions



Notes: *Below mean* and *Above mean* refer to the average level of *Intensity* for countries with average number of conditions (*BA2TOT*) below and above the sample mean of *BA2TOT*.

Table 1: Categories of IMF conditions

A. IMF Conditions	
1.	<u>Quantitative conditions</u>
	<u>1.1 Quantitative performance criteria (QPCs):</u> Quantifiable conditions that need to be fulfilled for the completion of a review and are classified as hard conditions. Examples: fiscal balances, levels of external debt.
	<u>1.2 Indicative benchmarks (IBs):</u> Complementary targets for quantitative performance criteria and are classified as soft conditions. Examples: Minimum levels of domestic revenue collection.
2.	<u>Structural conditions</u>
	<u>2.1 Prior actions (PAs):</u> Conditions that need to be met before IMF approves loans or finalizes a review. These are also used as necessary conditions if a country failed fulfill its prior commitments. These are the strictest conditions and are classified as hard conditions. Examples: Labor market reforms including reducing minimum wages, increasing retirement age or employee hiring and firing costs.
	<u>2.2 Structural performance criteria (SPCs):</u> Structural reforms that are considered as crucial for the success of an IMF program and are classified as hard conditions. Examples: Banking laws.
	<u>2.3 Structural benchmarks (SBs):</u> Non-quantifiable reform conditions and are classified as soft conditions. Examples: Reforms for financial sector, or management of public finances.
B. Classification of Conditions	
1.	Fiscal Issues (FP) (16.6%)
2.	Revenues and tax issues (RTP) (7.3%)
3.	Financial sector, monetary policy, and Central Bank Issues (FIN) (26.1%)
4.	SOE reform and pricing (SOE) (4%)
5.	SOE privatization (PRI) (1.8%)
6.	External debt issues (DEB) (28.4%)
7.	External sector (trade and exchange system) (EXT) (8.8%)
8.	Labor issues (LAB) (3.4%)
9.	Social policy (SP) (0.5%)
10.	Redistributive policies (POV) 1.4%)
11.	Institutional reforms (INS) (1.2%)
12.	Land and environment (ENV) (0.3%)
13.	Residual category (OTH) (0.3%)

Source: Adopted from Kentinelesis et al. (2016, 2017). Percentages in parenthesis refer to the share of each policy area in total number of soft and hard conditions (BA1TOT) in the master dataset.

Table 2: Summary Statistics

Variable	Obs	Mean	Std.	Min	Max
<i>Intensity</i> _{<i>it</i>}	4,385	0.441	0.163	0.047	0.978
<i>Intensity</i> _{<i>it</i>} ^{OECD}	4,372	0.402	0.121	0.201	0.773
<i>ECI</i> _{<i>it</i>}	3,339	0.058	1.007	-2.791	2.625
<i>Herfindabl</i> _{<i>it</i>}	4,518	0.168	0.144	0	1.000
<i>IMFProgram</i> _{<i>it</i>}	4,521	0.292	0.455	0	1
<i>BA1TOT</i> _{<i>it</i>}	4,521	10.628	19.436	0	148
<i>BA2TOT</i> _{<i>it</i>}	4,521	7.187	13.617	0	124
<i>BA3TOT</i> _{<i>it</i>}	4,521	17.816	32.625	0	272
<i>cBATOT</i> _{<i>it</i>}	3,580	7.443	13.667	0	114
<i>dBA1TOT</i> _{<i>it</i>}	3,580	9.293	17.778	0	126
<i>dBA2TOT</i> _{<i>it</i>}	3,580	6.519	12.736	0	93
<i>dBA3TOT</i> _{<i>it</i>}	3,580	15.812	30.136	0	204
<i>QCsTOT</i> _{<i>it</i>}	4,521	7.894	14.071	0	92
<i>QPCsTOT</i> _{<i>it</i>}	4,521	5.962	11.061	0	63
<i>IBsTOT</i> _{<i>it</i>}	4,521	1.932	5.329	0	56
<i>SCsTOT</i> _{<i>it</i>}	4,521	2.734	6.788	0	94
<i>PAsTOT</i> _{<i>it</i>}	4,521	0.861	3.382	0	78
<i>SPCsTOT</i> _{<i>it</i>}	4,521	0.365	1.308	0	27
<i>SBsTOT</i> _{<i>it</i>}	4,521	1.509	3.865	0	54
<i>IntIMF</i>	4,521	1.452	1.360	0	5.924
<i>IntBA2TOT</i>	4,521	37.513	38.191	0	190.407
<i>lnRGDPPC</i> _{<i>it</i>}	4,521	8.878	1.202	6.016	11.941
<i>RGDPG</i> _{<i>it</i>}	4,521	3.541	4.994	-66.967	60.327
<i>lnPop</i> _{<i>it</i>}	4,521	2.099	1.786	-2.714	7.237
<i>Openness</i> _{<i>it</i>}	4,516	79.219	51.242	1.378	442.620
<i>Credit</i> _{<i>it</i>}	4,363	44.603	40.811	0.007	304.575
<i>lnREER</i> _{<i>it</i>}	4,521	0.844	0.522	-0.588	2.548
<i>CA</i> _{<i>it</i>}	4,126	-2.434	9.532	-240.521	54.671
<i>Fiscal</i>	4,429	15.477	5.828	0.000	76.222
<i>Inflation</i>	4,214	22.251	254.245	-18.109	11,749
<i>UNSC</i> _{<i>it</i>}	4,225	0.072	0.259	0.000	1.000
<i>PctAgreeUS</i> _{<i>it</i>}	4,049	0.218	0.144	0.000	1.000

Notes: *Intensity*, *Intensity*^{OECD}, *ECI*, and *Herfindabl* refer to export intensity by Lall (2000), export intensity by OECD (2011), Economic Complexity Index, and Herfindahl export concentration index, respectively. *IMFProgram* is IMF program participation dummy. *BA1TOT*, *BA2TOT*, *BA3TOT* are total number of soft and hard IMF conditions, total number of hard conditions, and weighted sum of

hard and soft conditions, respectively. $cBATOT$, $dBA1TOT$, $dBA2TOT$, $dBA3TOT$ are implementation-corrected hard conditions, number of conditions discounted by interruptions, implementation-discounted hard conditions, and implementation-discounted weighted conditions, respectively. QCs , $QPCs$, IBs , SCs , PAs , $SPCs$, and SBs are total quantitative conditions, quantitative performance criteria, indicative benchmarks, total structural conditions, prior actions, structural performance criteria, and structural benchmarks. \ln refers to the natural log. $RGDPPC$ is (expenditure-side) real GDP at chained PPPs (in mil. 2011USD), $RGDPG$ is real GDP growth in constant 2011 national prices (in mil. 2011USD), Pop is total population (millions), $Openness$ is the share of exports and imports in GDP, $Credit$ is the share of private credit by deposit money banks and other financial institutions in GDP, $REER$ is real exchange rate with respect to the US, CA is current account balance in GDP, $Fiscal$ is the general government final expenditures in GDP, $UNSC$ is a dummy variable equaling one when a country is a temporary member in the United Nations Security Council, $PctAgreeUS$ is Lijphart's index of agreement between a UN member state and the U.S.

Table 3: Effect of IMF programs and conditionality on trade structure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(OLS)	(OLS Full)	(2SLS)	(2SLS Full)	(GMM Full)	(CMP)	(CMP Full)
<i>IMFProgram</i> _{<i>t-1</i>}	-0.004 (0.004)	-0.007 (0.005)	-0.237 (0.220)	-0.359 (0.218)	0.001 (0.005)	-0.002 (0.013)	-0.013 (0.011)
<i>BA2TOT</i> _{<i>t-1</i>}	0.00001 (0.0001)	0.0002 (0.0001)	0.004 (0.003)	0.005 (0.004)	0.0001 (0.0001)	-0.0004 (0.0004)	0.00004 (0.0003)
<i>lnPop</i> _{<i>t-1</i>}	-0.033 (0.029)	0.041 (0.035)	-0.040 (0.035)	0.033 (0.046)	-0.029 (0.040)	-0.033 (0.029)	0.042 (0.035)
<i>Openness</i> _{<i>t-1</i>}		0.0005** (0.0002)		0.0004* (0.0002)	-0.0001 (0.0002)		0.0005** (0.0002)
<i>Credit</i> _{<i>t-1</i>}		0.0003** (0.0001)		0.0004** (0.0002)	-0.0001 (0.0001)		0.0003** (0.0001)
<i>lnREER</i> _{<i>t-1</i>}		-0.025** (0.011)		0.016 (0.029)	-0.018 (0.015)		-0.025** (0.010)
Country & Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	5321	4199	5321	4198	4174	5521	4521
Number of countries	175	160	175	159	160	176	164
SW Chi-sq	n.r.	n.r.	[0.099, 0.026]	[0.049, 0.024]	n.r.	n.r.	n.r.
F-test	n.r.	n.r.	[0.100, 0.001]	[0.008, 0.000]	n.r.	n.r.	n.r.
SW-F	n.r.	n.r.	[0.100, 0.028]	[0.052, 0.026]	n.r.	n.r.	n.r.
Kleinbergen-Paap LM	n.r.	n.r.	0.106	0.051	n.r.	n.r.	n.r.
AR2	n.r.	n.r.	n.r.	n.r.	0.494	n.r.	n.r.
Hansen J	n.r.	n.r.	n.r.	n.r.	1.000	n.r.	n.r.
F-stat for Program	n.r.	n.r.	0.10	n.r.	n.r.	0.000	0.000
F-stat for Conditions	n.r.	n.r.	0.001	n.r.	n.r.	0.000	0.000
Joint F-Stat	n.r.	n.r.	n.r.	n.r.	n.r.	0.000	0.000

Notes: The dependent variable is *Intensity*. The results are with cluster-robust standard errors in parenthesis. ***, **, and * refer to $p < 0.01$,

$p < 0.05$, $p < 0.1$, respectively. *Country FE* and *Year FE* are country and year fixed effects. *N* is the number of observations. *F-test* is F test of excluded instruments, *SW Chi-sq* and *SW-F* are the Sanderson-Windmeijer first-stage chi-squared and F statistics for IMF program and condition equations, *Kleinbergen-Paap LM* is p-value of Kleinbergen-Paap LM rk LM statistics for program and condition equations, respectively. *AR2* is the AR test of order 2. *Hansen J* is the p-value of Hansen's J statistic. *F-stat for Conditions* and *F-stat for Program* are p-values for Kleibergen-Paap F-statistics for the significance of compound IVs for the *IMFConditions* and *IMFProgram* equations. *Joint F-stat* is the p-value of the F-statistics for the joint significance of compound IVs. nr is not reported. For other variable definitions, refer to Table 2.

Table 4: Alternative composite measures of IMF conditionality

	(1)	(2)	(3)	(4)	(5)	(6)
	BA1	BA3	cBA	dBA1	dBA2	dBA3
<i>IMFProgram</i> _{t-1}	-0.017 (0.011)	-0.016 (0.011)	-0.012 (0.014)	-0.018 (0.014)	-0.016 (0.013)	-0.018 (0.014)
<i>IMFConditions</i> _{t-1}	0.0002 (0.0002)	0.0001 (0.0001)	0.0002 (0.0004)	0.0005* (0.0003)	0.0005 (0.0004)	0.0003 (0.0002)
Country & Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	4,521	4,521	4,481	4,481	4,481	4,481
Number of countries	164	164	163	163	163	163
F-stat for Conditions	0.000	0.000	0.000	0.016	0.000	0.004
F-stat for Program	0.000	0.000	0.000	0.000	0.000	0.000
Joint F-Stat	0.000	0.000	0.000	0.000	0.000	0.000

Notes: The dependent variable is *Intensity*. All regressions include a full set of control variables as in column (7) of Table 3. The abbreviation *TOT* is dropped from variable names for space limitations (i.e., *BA1* is *BA1TOT* as in Table 2). The results are with cluster-robust standard errors in parenthesis. ***, **, and * refer to $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively. *F-stat for Conditions* and *F-stat for Program* are p-values for Kleibergen-Paap F-statistics for the significance of compound IVs for the *IMFConditions* and *IMFProgram* equations. *Joint F-stat* is the p-value of the F-statistics for the joint significance of compound IVs. For other variable definitions, refer to Tables 2 and 3.

Table 5: Quantitative and structural conditions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Quantitative conditions				Structural conditions		
	QCs	QPCs	IBs	SCs	PAs	SPCs	SBs
<i>IMFProgram</i> _{<i>t-1</i>}	-0.016 (0.011)	-0.013 (0.011)	-0.013 (0.011)	-0.015 (0.010)	-0.011 (0.010)	-0.013 (0.010)	-0.015 (0.010)
<i>IMFConditions</i> _{<i>t-1</i>}	0.0002 (0.0003)	0.0001 (0.0003)	0.0004 (0.0004)	0.0004 (0.001)	-0.0002 (0.0001)	0.001 (0.003)	0.001 (0.001)
Country & Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	4,521	4,521	4,521	4,521	4,521	4,521	4,521
Number of countries	164	164	164	164	164	164	164
F-stat for Conditions	0.000	0.000	0.292	0.000	0.000	0.015	0.000
F-stat for Program	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Joint F-Stat	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: The dependent variable is *Intensity*. All regressions include a full set of control variables as in column (7) of Table 3. The results are with cluster-robust standard errors in parenthesis. ***, **, and * refer to $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively. *F-stat for Conditions* and *F-stat for Program* are p-values for Kleibergen-Paap F-statistics for the significance of compound IVs for the *IMFConditions* and *IMFProgram* equations. *Joint F-stat* is the p-value of the F-statistics for the joint significance of compound IVs. For other variable definitions, refer to Tables 1-3.

Table 6: IMF conditions by type

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	QCs&SCs	FP	RTP	FIN	SOE	PRI	DEB ^a
<i>IMFProgram_{t-1}</i>	-0.003 (0.007)	-0.003 (0.007)	-0.002 (0.007)	-0.003 (0.007)	-0.003 (0.007)	-0.003 (0.007)	0.002 (0.007)
<i>IMFQConditions_{t-1}</i>	-0.0001 (0.0003)						
<i>IMFSCConditions_{t-1}</i>	0.0001 (0.001)						
<i>IMFConditions_{t-1}</i>		0.001 (0.001)	-0.001 (0.003)	0.000 (0.001)	0.002 (0.005)	0.008 (0.007)	-0.002* (0.001)
<i>IMFResConditions_{t-1}</i>		-0.0003 (0.0004)	-0.0001 (0.0003)	-0.000 (0.001)	-0.0001 (0.0003)	-0.0001 (0.0003)	0.001 (0.001)
Country & Yea FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	4,521	4,521	4,521	4,521	4,521	4,521	4,521
Number of countries	164	164	164	164	164	164	164
F-stat for Conditions (1)	0.000	0.699	0.023	0.000	0.015	0.003	0.000
F-stat for Conditions (2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
F-stat for Program	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Joint F-Stat	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: The dependent variable is *Intensity*. All regressions include a full set of control variables as in column (7) of Table 3. The results are with cluster-robust standard errors in parenthesis. ***, **, and * refer to $p < 0.01$, $p < 0.05$, $p < 0.1$, *FP* is fiscal issues, *RTP* is revenues and tax issues, *FIN* is financial sector, monetary policy and Central Bank issues, *SOE* is SOE reform and pricing, *PRI* is privatization, *DEB* is external debt issues, *EXT* is external sector, *LAB* is labor issues, *SP* is social policy, *POV* is redistributive policies, *INS* is institutional reforms, *ENV* is land and environment, and *OTH* is the residual category. *F-stat for Conditions (1)* and *F-stat for Conditions (2)* are p-values for Kleibergen-Paap F-statistics for the significance of compound IVs for the *IMFConditions* and *IMFResConditions* equations. *F-stat for Program* is p-values for

Kleibergen-Paap F-statistics for the significance of compound IVs for the *IMFProgram* equation. *Joint F-stat* is the p-value of the F-statistics for the joint significance of compound IVs. For ^a see endnote 8. For other variable definitions, refer to Tables 1-3.

Table 7: IMF conditions by type (continued)

	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	EXT ^a	LAB	SP	POV ^a	INS	ENV	OTH
<i>IMFProgram</i> _{<i>t-1</i>}	-0.004 (0.007)	-0.003 (0.007)	-0.003 (0.007)	-0.003 (0.007)	-0.003 (0.007)	-0.003 (0.007)	-0.003 (0.007)
<i>IMFConditions</i> _{<i>t-1</i>}	0.001 (0.003)	0.002 (0.004)	-0.012 (0.012)	0.004 (0.006)	-0.018 (0.015)	-0.016 (0.019)	0.039 (0.025)
<i>IMFResConditions</i> _{<i>t-1</i>}	-0.0001 (0.0004)	-0.0001 (0.0004)	0.0001 (0.0003)	-0.0001 (0.0003)	0.00005 (0.0003)	-0.00002 (0.0003)	-0.0001 (0.0003)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	4,521	4,521	4,521	4,521	4,521	4,521	4,521
Number of countries	164	164	164	164	164	164	164
F-stat for Conditions (1)	0.000	0.312	0.363	0.010	0.350	0.000	0.772
F-stat for Conditions (2)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
F-stat for Program	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Joint F-Stat	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: The dependent variable is *Intensity*. All regressions include a full set of control variables as in column (7) of Table 3. The results are with cluster-robust standard errors in parenthesis. ***, **, and * refer to $p < 0.01$, $p < 0.05$, $p < 0.1$, respectively. *F-stat for Conditions (1)* and *F-stat for Conditions (2)* are p-values for Kleibergen-Paap F-statistics for the significance of compound IVs for the *IMFConditions* and *IMFResConditions* equations. *F-stat for Program* is p-values for Kleibergen-Paap F-statistics for the significance of compound IVs for the *IMFProgram* equation. *Joint F-stat* is the p-value of the F-statistics for the joint significance of compound IVs. For other variable definitions, refer to Tables 1 and 6.

Table 8: Alternative measures of export intensity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(OLS)	(OLS Full)	(2SLS)	(2SLS Full)	(GMM Full)	(CMP)	(CMP Full)
Intensity-OECD							
<i>IMFProgram_{t-1}</i>	0.001 (0.004)	-0.003 (0.004)	-0.109 (0.144)	-0.228** (0.116)	-0.006 (0.004)	0.012 (0.034)	-0.023* (0.013)
<i>IMFConditions_{t-1}</i>	-0.0001 (0.0001)	0.0001 (0.0001)	0.002 (0.002)	0.001 (0.002)	0.0001 (0.0001)	-0.001 (0.001)	0.0001 (0.0002)
<i>N</i>	5,302	4,186	5,302	4,185	4,150	5,509	4,515
Number of countries	175	160	175	159	160	176	164
ECI							
<i>IMFProgram_{t-1}</i>	-0.038 (0.024)	-0.013 (0.026)	-0.504 (0.438)	-0.574 (0.481)	-0.003 (0.022)	-0.116 (0.102)	0.024 (0.093)
<i>IMFConditions_{t-1}</i>	0.00008 (0.001)	-0.00004 (0.001)	0.018 (0.012)	0.010 (0.010)	-0.0000 (0.0003)	-0.001 (0.002)	-0.001 (0.002)
<i>N</i>	3,797	3,179	3,797	3,179	3,176	4,715	4,208
Number of countries	121	116	121	116	116	164	161
Herfindahl index							
<i>IMFProgram_{t-1}</i>	0.002 (0.006)	0.002 (0.006)	-0.170 (0.341)	-0.090 (0.136)	0.001 (0.004)	0.180** (0.076)	0.062 (0.117)
<i>IMFConditions_{t-1}</i>	-0.0001 (0.0001)	-0.0002 (0.0002)	0.0002 (0.005)	0.003 (0.002)	-0.00002 (0.0001)	-0.004 (0.010)	-0.003 (0.004)
<i>N</i>	5,605	4,379	5,605	4,377	4,379	5,675	4,574
Number of countries	174	162	174	160	162	175	165

Notes: *Intensity-OECD* is the OECD based definition of export intensity, *ECI* is Economic Complexity Index, *Herfindahl index* is the Herfindahl concentration index. For other variable definitions, refer to Tables 1-3.