



Out of the shadows or into the dark? Economic openness, IMF programs, and the growth of shadow economies

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Abstract The existence of shadow economies is an important, yet understudied, issue for international political economy and development. This study examines how two distinct types of international economic engagement—economic openness and participation in International Monetary Fund (IMF) programs—affect the growth of shadow (informal) sectors. We theorize that increased economic openness will reduce the size of countries’ shadow sectors. More specifically, we posit that eliminating market-distorting trade barriers will decrease the incentives for shadow sector activities such as smuggling. Additionally, we posit that increased participation in global production and supply chains is likely to lead to a positive, “climb to the top” effect on states’ regulatory and labor policies that enhance the prospective benefits associated with formal sectors. Conversely, we argue that participation in IMF structural adjustment programs can lead to great shadow sector activity as IMF-imposed structural conditions might cause significant near-term economic hardship and degrade states’ regulatory capacity. The results from a panel of 145 countries from 1971 to 2012 indicate that economic openness reduces the size of the shadow economy, while participation in IMF programs is significantly related to a larger shadow economy. These findings have

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important implications for understanding how the divergent forms of international economic engagement might affect shadow economies.

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1 Introduction

What is the relationship between formal and informal global economies? Does increased participation in the licit global economy serve as a supplement or substitute for involvement in the shadow economy?¹ To date, there is no clear answer for how economic globalization affects the growth of shadow economies. While an increasing amount of attention has been devoted to shadow economies, a relative paucity of systematic research addresses its broader political and economic foundations. Additionally, there are multiple dimensions of international economic engagement, which can have different effects on national economies. How countries experience globalization and the transformational effects it has on the nature of both their formal and informal economies can thus vary substantially. The purpose of this study is to empirically assess the possible effect that two salient forms of economic engagement—economic openness and International Monetary Fund (IMF) program participation—have on the extent of informal economic activity.

Examining the growth of shadow sectors is essential to understanding both the trajectory and the social, political, and economic impacts of international economic ties. First, the shadow sector makes up a substantial portion of the global economy. According to OECD estimates from 2009, approximately 1.8 billion workers engage in unregulated, untaxed, off-the-books forms of labor around the world (Neuwirth 2011). As a whole, the size of the global shadow sector is estimated at over \$10 trillion and continues to grow (Neuwirth 2011). The shadow economy is also a “crucial issue” (Elbahnasawy et al. 2016: 31) for economic development, as it raises key questions for a state’s governance as well as the economic welfare of its citizenry. Workers face far greater vulnerabilities in the shadow sector, as they lack job security, legal protections, and often face depressed wages (ILO 2002). Shadow economies also result in lost revenues to the state (Awasthi 2016), which results in decreased funding for social welfare policies, military budgets, and other important national priorities (Loayza 1997).

Yet many aspects of the shadow economy remain under-examined and poorly understood. In this paper, we examine how participation in the licit global economic order impacts the extent of shadow sector activity. While past work has explored some of the ways in which globalization might influence illicit commerce (i.e., Naim 2005), there is a dearth of systematic analysis on the effects of licit foreign economic ties on the illicit economy. Moreover, given the varying mechanisms that encompass globalization, we expect that these multiple facets are unlikely to impact shadow sector activity in the same way. In this study, we explore

¹ By way of definition, the shadow economy comprises those activities that go unreported, unregulated, and untaxed (Feige 1989, 1990; Schneider and Williams 2013). The most common shadow sector activities include otherwise legal but unrecorded and untaxed commercial transactions, unreported labor, and smuggling and illicit commerce. The terms of shadow economy and informal economy are used interchangeably throughout the manuscript.

two salient forms of foreign economic integration: economic openness and participation in the IMF's structural adjustment programs (SAPs). Our focus on the effects of these two different processes allows us to examine both "globalization from below" that emerges from commercial interactions and integration at the firm- and consumer-levels and "globalization from above" that is externally imposed on countries, in this case by international institutions like the IMF (Falk 1999; see also Kosack et al. 2004).

We theorize that openness to international commerce (i.e., flows of goods, capital, and services) will reduce shadow market activity. More specifically, the reduction of market-distorting tariffs and trade barriers will directly reduce economic incentives for shadow activity, such as smuggling for tariff evasion (e.g., Mishra et al. 2008). Additionally, increased participation in global production and supply chains is likely to lead to a "climb to the top" (e.g., Greenhill et al. 2009) effect wherein the diffusion of corporate best practices exerts a positive influence on state policies in this area, which can increase the prospective benefits associated with the formal economy. Both reduced trade barriers and increased exposure to foreign trade and investment should thus diminish the growth of countries' shadow economies. By contrast, participation in IMF programs bodes poorly for the formal sector. In this case, conditions and reforms imposed by the IMF beget a toxic combination of economic hardship and reduced state capacity—at least in the short-term—that can drive a state's constituents into the shadow sector. Together, these divergent pathways of globalization allow us to better understand how participation in the world economy might shape domestic economies.

To test these linkages, we conduct a time-series cross-sectional analysis of the factors affecting the size of the shadow sector in 145 countries from 1971 to 2012. While measuring the shadow economy is a difficult enterprise, we rely on one of leading indicators of the growth of shadow economies developed by Elgin and Oztunali (2012) as our dependent variable. The data capture the overall size of all major types of shadow economic activity and were created using dynamic general equilibrium model. For our economic openness variables, we employ the KOF *Economic Globalization* data (Dreher 2006) as well as data on trade and foreign investment ties to capture countries' commercial ties. We use data on participation in IMF programs from Nooruddin and Woo (2015) and the IMF's structural conditions data from Kentikelenis et al. (2016). Using a variety of different estimation strategies including a GMM model to account for endogeneity, we find robust evidence that our measures of economic openness are significantly linked to the decline of shadow sectors while participation in IMF programs, particularly the policy conditions contained in SAPs, is positively associated with larger shadow economies.

The remainder of the study is as follows. We begin by discussing the relevant literature on shadow economies. We then present our theory about the varying ways in which increasing amounts of international economic engagement can impact countries' shadow sectors. The next section explains our research design and presents the data findings. The conclusion discusses the broader implications of our findings and opportunities for future research.

2 Why do shadow economies exist?

Broadly put, governments play key roles in regulating economic activities within their territories, taxing commercial transactions, protecting property rights, and enforcing

contracts. Economic agents that participate in the formal economy can benefit from better protection of property rights, enforcement of contracts, and an efficiently regulated marketplace, but must pay taxes and compliance-related costs in return. By choosing to engage in the shadow economy, individuals and firms avoid the costs (regulatory restrictions, prohibitions, and criminalized behaviors) associated with the formal economy but also forgo the benefits it provides (Eilat and Zinnes 2002: 1234).

Earlier studies of the shadow economy examined the reasons why economic actors choose to engage in this sector, with a particular focus on the quality of governance and business-related policies. The general consensus was that individuals and firms are more likely to conduct their business within the shadow economy if they face stifling bureaucratic environments, onerous regulatory burdens, and significant, obtuse tax obligations (Johnson et al. 1998; Friedman et al. 2000; Schneider 2005; Awasthi 2016). From a macroeconomic perspective, studies found that the growth in the shadow economy runs counter-cyclical to the formal economy (Loayza and Rigolini 2011; Bajada and Schneider 2009). In other words, downturns in countries' formal economies lead to an upswing in informal economic activities. Research has also explored the complex and potentially interdependent relationship between corruption and shadow economies (Johnson et al. 1998; Friedman et al. 2000; Dreher and Schneider 2010). More recent studies have begun exploring the impact of broader political factors, such as regime type and political stability, on shadow sectors (Elbahnasawy et al. 2016).

The relationship between economic globalization and the shadow economy has received some attention within this body of work, as it taps into the foundational issue of the relationship between the licit and illicit economies. Most work in this area posits that the shadow economy exists as much more of a complement—rather than a substitute—for legal market activities. That is, growth in the licit global economy will concomitantly spur growth in the illicit economy, with the latter piggybacking on the former (Naim 2005). More broadly, Gilman et al. (2011: 3) point out that the “infrastructure of the global economy is dual use and value neutral” and shadow and formal economies “are very much intertwined.” Or as Andreas (2004: 652) puts it, “every sector of the licit economy has its illicit counterpart.” Indeed, though much attention is devoted to illegal goods such as recreational drugs and weapons, there are thriving and pervasive illicit markets in otherwise legal products, such as cigarettes, art, and even maple syrup (Hamilton 2013; Walker-Guevara et al. 2009; Bator 1982). These connections can be particularly pernicious in the developing world, where state capacity and the ability to regulate economic interactions are weaker. In these cases, global capital expands both formal and informal economies, with the latter developing at the “fringes” of the markets (McMichael 2000). It is thus argued that the “informalization of the economy is an unavoidable and defining feature of the effects of economic globalization, especially in the Global South” (Campbell 2005: 3). This suggests that as countries become increasingly integrated into the global economy, they will likewise increase their involvement with the illicit global economy.

Though this “intertwined” relationship between the licit and illicit is commonly asserted, and has found some support in country-specific studies (Campbell 2005; McMichael 2000), there has not been any comprehensive, cross-national assessment of the actual impact of economic globalization on the shadow economy. We suggest that a more complex dynamic exists between economic globalization and the shadow economy. Specifically, globalization “from below,” comprised of increased integration into the global economy through reduced commercial barriers and increased market

interactions, is associated with reduced shadow sector activity. Conversely, externally-imposed globalization “from above”—participation in IMF Structural Adjustment Programs—is positively related to the growth of the shadow sector. We discuss these divergent dynamics below.

2.1 Economic openness and the shadow economy

Increased openness to the global economy, measured in terms of both economic interactions and policies intended to encourage these interactions, can reduce the growth of the shadow sector. First, the removal of barriers to trade and investment eliminates one of the key economic drivers of illicit trade—the promise of making a profit due to tax avoidance. Moreover, participation in global supply and production chains may engender a “climb to the top” effect, wherein the “best practices” of multinational corporations may diffuse to countries in which they do business.

Impediments to trade and investment, such as tariffs, capital controls and other trade-restricting measures, can directly incentivize the formation of illicit businesses, as they provide rent-seeking opportunities for potential smugglers (e.g., Krueger 1974). The basic dynamic here is that through avoiding taxes, an illicit economic enterprise can assert an advantage over their legitimate, and tax-paying, competitors. Market-distorting regulations, particularly differential taxation rates between or within countries, are a leading impetus for the illicit production and sale of otherwise legal goods, such as lucrative trade in the smuggling of cigarettes within the United States and EU, as well as the multi-billion-dollar tobacco industry in Paraguay, which supplies black-market cigarettes throughout Latin America (Gomis and Botero 2016).

Tariffs and other trade restrictions distort the market in a similar fashion, as the import taxes and barriers create an opportunity to avoid taxation—and increase profit margins—through illicit economic activity. Indeed, the shadow economy is replete with examples of industries that arose specifically to avoid tariffs and other trade-restricting policies, including natural resources such as timber and rare earth metals (Vézina 2015) and agricultural products like garlic (BBC 2013). The black market for cell phones in Argentina provides an amusing example of these dynamics. Seeking to increase manufacturing in her country, President Kirchner imposed high tariffs on all manufactured products and a ban on the importation of cellphones. However well-intentioned, domestically-produced phones were expensive, and the ban created a shadow economy for the smuggling of foreign cellphones. Indeed, hundreds of international travelers to Argentina would wear knee-high socks stuffed full of cell phones and hide additional phones within their luggage. As one smuggler noted, given the profit margin of over \$200 per phone, “you can’t afford to not smuggle phones!” (Planet Money 2017).

Openness to the global economy also connotes the increased involvement of multinational corporations, which can generate positive impacts on governance and thus enhance participation in the formal economy. While much popular attention has been devoted to the “race to the bottom” dynamic (e.g., Drezner 2000), there is ample evidence of a “climb to the top” or “California effect” wherein participation in the global economy “generates an upward trajectory in standards” (Greenhill et al. 2009: 669; Vogel 1997). While the immediate incentive for firms is to improve productivity and profitability, such “engagement also creates avenues for the exchange of ideas and norms about appropriate public policies and corporate conduct” (Adolph et al. 2017: 2). More specifically, the best

practices of multinational corporations may “spill over to local firms as well.” Ultimately, “because of the sizeable externalities multinationals create in host countries, these practices are often adopted through the economy” (Greenhill et al. 2009: 670).²

These processes can create a virtuous cycle that benefits both multinationals and host governments. Corporations can flourish in a country with improved rule of law, increased educational opportunities, a modicum of social services and infrastructure, and the protection of human rights (e.g., Kucera 2002; Moran 2011; Noorbakhsh et al. 2001). These conditions create a stable and less risky business climate more “conducive to the development of human capital,” as such countries are “generally more open, accountable, and economically efficient” (Blanton and Blanton 2007: 143). Societies also benefit from these ties. Research has shown that various facets of economic openness, such as participation in preferential trading arrangements (PTAs) and higher volumes of trade and investment, are associated with a variety of positive governance outcomes, including better protection of labor and environmental regulations as well as improved human rights conditions (e.g., Blanton and Blanton 2007; Hafner-Burton 2005; Greenhill et al. 2009; Prakash and Potoski 2007).

These dynamics have implications for the reduction of the shadow economy, as the diffusion of workplace practices and standards brought about by trade and investment ties can incentivize participation in the formal workplace. Most directly, increased labor standards and rights connote greater benefits to joining the formal workforce as opposed to the informal sector. Moreover, the positive societal externalities of economic integration, particularly educational opportunities and social services, can help a better-skilled pool of labor find work in the formal sector instead of resorting to informal work. Therefore, the “climb to the top” effects of economic openness can increase the incentives and the opportunities to leave the shadow economy.

Taken as a whole, we thus anticipate that economic openness increases the incentives that both firms and workers have to conduct their economic activities in the formal as opposed to the informal sector. The reduction of barriers to trade and investment essentially removes a key incentive for businesses and individuals to enter the shadow economy, while the diffusion of business norms and practices—brought about by multinationals—can further incentivize participation in the formal economy. This discussion leads to our first two hypotheses:

- Hypothesis 1: Lower trade and investment barriers are negatively related to the growth of the shadow economy.
- Hypothesis 2: More global trade and investment is negatively related to the growth of the shadow economy.

2.2 IMF conditions and the shadow economy

IMF programs, specifically Structural Adjustment Programs (SAPs), are commonly cited as a prime example of “globalization from above” (i.e., Kosack et al. 2004;

² Despite the dynamics supported by the above arguments, it should be noted that the impact of globalization (in general) and foreign capital (in particular) on labor rights remains contentious (i.e., Blanton and Blanton 2016; Mosley 2010).

Stiglitz 2004), as they involve sweeping changes in recipient countries that are essentially mandated by the institution. Somewhat unsurprisingly, the economic and societal impacts of IMF programs have long been a source of contention. SAPs often come with specific conditions that call for structural changes in the economic institutions of a state, including a smaller public sector, reduced social spending, and labor reforms (e.g., Kentikelenis et al. 2016). While there is often a fair degree of diversity in how conditions are negotiated and implemented (Steinwand and Stone 2008), the general purpose of SAPs is to reduce aggregate demand and to purportedly enable the recipient to better compete in the global marketplace. However, we posit that adherence to these programs—particularly the conditions entailed by SAPs—creates an economic and political climate which might increase informal economic activity in recipient countries.

Economically, the effects of IMF program participation are largely recessionary as the reduction in government spending and austere fiscal and monetary policies are associated with reduced economic growth and increased unemployment, particularly in the short-term (e.g., Bas and Stone 2014; Oberdabernig 2013; Dreher 2006; Easterly 2005; Przeworski and Vreeland 2000). Reduced employment opportunities in the formal economy, as well as tightening in government spending due to austerity measures, create a climate ripe for the expansion of the shadow economy, as employees may resort to informal work due to “no other job opportunity or source of income in the ‘formal’ economy” (Campbell 2005: 16).

The sociopolitical impacts of IMF programs might also contribute to the expansion of the shadow economy. First, the structural changes often mandated by IMF programs might have a deleterious impact on state capacity, specifically bureaucratic quality. Forced downsizing and reorganization might “instill volatility in the bureaucracy” (Reinsberg et al. 2016: 4–5), while other reform measures such as wage and labor flexibility may leave the organizations shorthanded and hamper the ability of these institutions to hire skilled personnel. As a result, bureaucratic performance might decline and governments’ capacity to effectively and efficiently regulate their economies might be weakened. Diminished resources and staff might increase the amount of time it takes for bureaucratic agencies to fulfill their basic tasks, such as issuing licenses and approvals. It could also engender disgruntlement among government employees, making them less effective at their jobs. This reduced state capacity might increase the perceived attractiveness of doing business in the shadow economy. On the one hand, citizens and businesses will find it more difficult to interact with regulatory agencies that are staffed by aggrieved, shorthanded personnel—increasing the transaction costs of complying with government policies. On the other hand, weakened, dispirited state regulators may also be less able or willing to enforce regulations that are labor-intensive to implement (i.e., tax collection).

At the same time, IMF conditions might also decrease the potential benefits associated with the formal economy. For example, extant research has found IMF programs to negatively impact the level of worker rights protections, including free association and collective bargaining rights as well as wage discrimination (Blanton et al. 2015; Abouharb and Cingranelli 2007). The literature on the shadow economy notes that overly restrictive or burdensome labor regulations encourage entry into the shadow economy, as they increase the cost to employers to operate in the formal economy (i.e., Schneider 2005). However, for workers the protection of basic labor rights can be an

important consideration when seeking work. Given the flexible and sometimes transient nature of informal work, a functioning labor rights regime is one of the primary benefits associated with work in the formal sector. The reduction of these rights could thus minimize the advantages of formal work and potentially steer employees into the shadow economy.

In all, the economic and sociopolitical impacts of IMF programs create a climate ripe for the expansion of the shadow economy. Foremost, conditions imposed by IMF programs often lead to the contraction of countries' formal sector economies at least in the short term that pushes labor and capital to explore informal opportunities. Moreover, the reduced state capacity and worker rights that these programs engender lessen the prospective benefits that workers can obtain from conducting their economic activities in the formal sector. The combination of economic hardship and decreased capacity thus serves to limit both the opportunities as well as the incentives to participation in the formal workplace. This discussion leads to the following hypothesis about the effects of "globalization from above":

Hypothesis 3: IMF program participation, and the structural conditions associated with the programs, are positively related to the growth of the shadow economy.

3 Data and model specifications

To assess the empirical merits of the hypotheses formulated in the preceding section, we gathered cross-national data for the 1971–2012 period for 145 countries. The exact number of countries included in each model are reported in the tables below. The list of countries, as well as the summary statistics for all the variables used in the main analysis, appear in the appendix (see Appendix Tables 3 and 4).

3.1 Outcome variable

As countries do not post official figures of illegal economic activities within their borders, there is a fair degree of diversity in the methodological approaches used to quantify the size of the shadow economy.³ Studies that focus on one country for a short time frame tend to opt for gathering data on firm or household-level tax audits, market surveys, and interviews to gauge the extent of informal economic activity. Some cross-national studies focus on specific macroeconomic variables such as labor force participation, electricity consumption, national wealth, and the demand for currency. They, for instance, analyze the discrepancies between the total demand for currency and the total use of the same currency to estimate the size of the informal economy. One major limitation of this approach is that it relies on only one indicator and thus makes simplified assumptions regarding the overall function of formal and informal sectors.

Cross-national studies of informal economic activity (e.g., Autio and Fu 2015; Goel and Saunoris 2014) have primarily relied on the global estimates produced by either

³ For comprehensive, critical overviews of the different methodologies, see Orsi et al. (2012) and Elgin and Oztunali (2012).

Schneider et al. (2010) or Elgin and Oztunali (2012). Both offer a general proxy that accounts for all major types of illicit economic exchanges such as unrecorded and untaxed commercial transactions, labor, and illicit commerce. The Schneider et al. dataset is available for 1999–2007, while the Elgin and Oztunali dataset covers 1950–2012. Though the two widely-used estimates are calculated using different methodologies, the data are highly correlated (about 0.98) for the 1999–2007 period during which both sources are available. Schneider et al. (2010) use the Multiple Indicators and Multiple Cause (MIMIC) approach, which treats informal activity as an unobserved latent variable. The size of the shadow economy is predicted in a two-step process: the first step uncovers the main causes underlying the shadow economy, while the second step estimates the coefficients of these variables using a structural equation model based on the findings of the first step.

Elgin and Oztunali (2012) rely on an alternative approach that utilizes a dynamic general equilibrium model. This approach enables them to match the macroeconomic factors first and then solve for the size of a given state's shadow economy. More specifically, they employ a dynamic general equilibrium (licit and illicit economies) in which infinitely-lived representative households choose between two production technologies (i.e., formal and informal technologies). They match various reported macroeconomic proxies (aggregate consumption, employment, and government spending) and then solve the model for the size of the shadow economy. While both datasets are generally accepted, given the much longer temporal coverage, as well as the strong correlation between the two main data sources, we use the data from Elgin and Oztunali. The shadow economy variable specifically captures the size of the informal economy as a percentage of GDP.⁴ We first-difference the variable (i.e., $Y_t - Y_{t-1}$) to create the Δ *Shadow Economy (%GDP)* variable. We use this first-differenced variable to test our hypotheses concerning the possible effects of economic globalization and IMF programs on the growth of informal economic activity. Methodologically, the first-differenced approach also enables us to more effectively address potential problems with serial correlation in the data.

3.2 Explanatory variables

As discussed above, we test the impact of two different types of international economic engagement on the shadow economy—economic openness and participation in IMF programs. We use several different measures of economic openness. Our first variable, *KOF Index*, is the economic globalization index variable of the KOF database (Dreher 2006). The index includes information on the extent of cross-border economic flows, including trade, foreign direct investment, and portfolio investment, as well as policies that influence these exchanges, such as tariff rates, non-tariff barriers, capital account restrictions, and taxes related to global trade. It ranges from 9 to 100 in our sample (out of a possible range of 0 to 100), with higher scores denoting lower levels of global economic integration and thus greater economic openness. We use the index variable to assess the link between the overall economic integration of a country in to the global

⁴ To check the robustness of our findings, we report additional ordinary least square models using the Schneider et al. data for the 1999–2007 period in the online appendix. We find mostly similar results in these additional models, but there are some differences that are likely related to the far shorter period of analysis.

economy and the extent of informal economic activity. This variable provides a joint test of hypotheses 1 and 2, capturing both constituent elements of economic openness that we theorize.

Our second variable, *KOF Restrictions*, captures only policies that are intended to restrict the free flow of global trade or capital. This variable enables us to more directly test Hypothesis 1, as this measure directly measures tariffs and other barriers to trade. It ranges from 4 to 98 in our sample, with higher scores denoting lower levels of policy restrictions and thus greater economic openness. To test our second hypothesis on the impact of trade and investment ties, we use the two most commonly used measures of global economic transactions, the natural log of trade as a percentage of GDP (*Trade*) and the natural log of foreign direct investment inflows as a percentage of GDP (*FDI*).⁵ The former is coded using the total of imports plus exports of a country, while the *FDI* measure employs the total volume of FDI flows into a country within a given year. Data for these variables come from the World Development Indicators (WDI) database (World Bank 2016).⁶

To test Hypotheses 3, we first use *IMF Program Participation*, a binary variable coded one for years during which a country is under an IMF program, and zero otherwise. Data for the IMF Participation measure come from Nooruddin and Woo (2015) who recently updated the data by Vreeland (2003). To better account for the diversity of IMF programs, we also include a measure of the number of binding *Structural Conditions*, that is loan conditions which are directly linked to disbursements of loans (Kentikelenis et al. 2016; see also Copelovitch 2010). More specifically, the variable captures the total number of conditions in IMF programs that deal with the public sector, government reorganization, privatization, and the business environment. We focus on conditions, rather than quantitative targets or technical assistance, as conditions are broadly considered to be the most intrusive aspect of IMF programs. The conditions data come from Kentikelenis et al. (2016).

We also introduce a battery of control variables to account for the other major correlates of informal economic activity as identified by the relevant literature (Johnson et al. 1998; Friedman et al. 2000; Dreher and Schneider 2010; Elbahnasawy et al. 2016). To account for the negative impact of overall economic wealth and stability on the shadow sector, we include *GDP per capita* (logged), annual *GDP Growth*, and *Inflation*. The inflation variable is the rate of price change in a given economy based on the yearly change in the GDP implicit deflator. Lower inflation rates tend to denote a more stable economy. These variables are from the WDI database (World Bank 2016).

Political regime type is another key factor that might substantially affect the extent of economic exchanges in the underground economy. Established democratic polities tend to be more stable and have strong rule-of-law traditions that might create a political environment less conducive to illicit economic activity by private economic agents

⁵ We employ these two trade and investment measures instead of the *KOF Actual Flows* index variable (Dreher 2006), as *KOF Actual Flows* includes two other measures (portfolio investment and income from foreign nationals) that are not germane to our proposed theory.

⁶ When we replace trade with two variables that capture imports and exports separately, we find similar results. That is, both imports and exports of goods and products significant lower the extent of shadow economic activity. We also tested the possible effect of FDI outflows and found no statistically significant association between FDI outflows and the growth of informal economies.

(Elbahnasawy et al. 2016).⁷ We include the *Democracy* variable, specifically the Polity2 index from the Polity IV dataset (Marshall et al. 2012) to control for political regime type. The variable is coded on a 21-point scale (−10 to 10) with higher scores indicating more democracy. We rescale this measure so that it ranges from 0 (least democratic) and 20 (most democratic). Elbahnasawy et al. (2016) show that mixed political regimes that are neither fully authoritarian nor consolidated democracies might experience more political instability and regime transitions that might, in turn, instigate more illicit economic activity.⁸ Thus, we also include a squared term of this variable (*Democracy Squared*) to account for a possible nonlinear association between regime type and the informal economy.

Violent conflicts could also affect the growth of states' shadow economies due to the hardships and disruptions they impose. As such, we include a measure of *Violent Conflict* to account for whether a country is experiencing an internal armed conflict using data from the UCDP/PRIO Armed Conflict Dataset (version 4–2014) (Gleditsch et al. 2002). The measure ranges from 0 to 2, with a score of 0 if a country does not experience any major internal armed conflict in a given year. It is coded 1 for conflicts in which the yearly death count ranges from 25 to 1000, and 2 for civil wars in which the annual total battle-related death count is above 1000. We also include the natural log of *Population* as the extent of informal economic activity might be higher in more populous countries. A large population size might challenge the government's ability to detect informal economic activity at the local level. It may also lead to resource scarcity and widespread poverty, which might encourage citizens to seek strategies to evade taxes and obtain scarce resources through the black market. We gathered the population data from the WDI database (World Bank 2016). To account for any unobserved time-specific factors, we include the linear *Time Trend* variable in the model.

3.3 Methodological concerns

We report our main models with country-fixed effects to ensure that the findings are not biased by any unobserved country-specific factors. Another germane issue is that of reciprocal causation. It is possible that there is a mutual interdependence (endogeneity) between our main explanatory variable and the extent of informal economic activity. That is, countries that are relatively less globalized and dependent on IMF loans might also be the ones that already have higher volumes of illicit economic exchanges. To

⁷ In the online appendix, we also report models with two additional proxies for political stability and quality of governance, *Control of Corruption* and *Bureaucratic Quality*. More official corruption and less efficient bureaucracies might create more opportunities for state officials and private economic agents to engage in informal economic activity. Both variables are from the International Country Risk Group (ICRG) dataset (Knack and Keefer 1998). The corruption variable varies from 0 to 6 with higher scores denoting less corruption in the government. The bureaucratic quality variable ranges from 0 to 4 with higher scores indicating more efficient bureaucratic establishment. Our main findings remain largely unaltered in the models estimated with these additional control variables. We do not control for the corruption and bureaucratic quality variables in the main analysis, as both variables are available for a shorter time period (post-1984) and fewer countries in the ICRG dataset, which reduces the sample size by roughly a third.

⁸ On a more micro level, Tajima (2014) shows how transitions into democracy can result in increased criminality as “the coercive grip of the state loosens” (p. 4). Indeed, Vreeland (2008) argues that the democracy measures themselves are defined in reference to the presence of violence, with the result being that more violence is apparent in the middle range of the democracy measures.

address this possible endogenous process, we employ two strategies. First, we lag our main explanatory variables as well as the time-variant control variables one year to ensure that they temporally precede the dependent variable one full year. Though the one-year lag approach is not necessarily a perfect solution to correct for the question of endogeneity, it at least temporally allows the explanatory variables to precede the outcome measure one full year.

Additionally, we run our models using a GMM (generalized method-of-moments) technique (Asiedu and Lien 2011; Roodman 2009). To account for endogeneity, the GMM approach that we adopt “takes the first difference of the data and then uses lagged values of the endogenous variables as instruments” (Asiedu and Lien 2011: 104; see also Blanton and Blanton 2015). This is particularly advantageous in that it enables the incorporation of multiple endogenous variables within a model and does not require the use of external instruments.⁹

4 Findings and discussion

Table 1 contains our models of the impact of economic openness on the growth of the shadow economy. We first estimate the models with a global sample and then repeat the same models with a sample restricted to non-OECD countries, as wealthy countries tend to have relatively small shadow economies, are more integrated into the global economy, and are the least likely recipients of IMF loans. We thus report the models with the restricted sample to make sure that the inclusion of wealthy countries does not bias our estimates. The results across these models lend significant and consistent support for our first two hypotheses, namely that higher levels of integration into the global economy, in the forms of pro-globalization economic policies as well as trade and foreign direct investment flows, significantly reduce the growth of informal economic activity. This finding holds for both the global and non-OECD countries samples. This implies that the removal of barriers to trade and investment is likely to reduce the shadow economy and that increasing levels of international trade and FDI flows also contribute to the contraction of shadow sectors.

To further elucidate the potential dynamics in the relationship between economic openness and smaller shadow economies over time, we report the change in the shadow

⁹ Stata’s `xtabond2` command is used to estimate the GMM model. In terms of model specifics, we derive the instruments using principal components analysis option with a one-year lag (e.g., Bai and Ng 2010). We also use the orthogonal transformation to the generated instruments, as it has been found to provide less biased and more stable instruments (Hayakawa 2009). Models also use robust standard errors with the two-step estimation option, as it provides increased efficiency (Roodman 2009). For the purposes of the models, we set each of our key independent variables, as well as our measures of economic growth and income, as endogenous. As lagged values tend to be weak instruments, GMM generates a large number of instruments, which raises two potential limitations: first the model requires a large sample size, and ultimately the total size of the instruments should be less than the number of groups included in a given model (i.e., Asiedu and Lien 2011; Baum et al. 2003). The former is not a problem in our analysis, and we limit the number of lagged values used in our instruments to keep the total number of instruments below the number of groups analyzed in our models. Results of the GMM models, included in Appendix Tables 3 and 4, largely support the findings of the main analyses. Though not reported in the main analysis to save space, as a further test of robustness, we also run models using two-stage least squares (2SLS) regression and continue to find significant support for our hypotheses in those models. More detailed explanations of the 2SLS models, as well as the results, appear in the [online appendix](#).

Table 1 The Impact of Economic Openness on the Change in the Shadow Economy (Fixed-Effects Models)

	Global Sample		Non-OECD Countries			
KOF Index	-0.005* (0.003)		-0.006* (0.003)			
KOF Restrictions	-0.007*** (0.002)		-0.009*** (0.003)			
Trade			-0.134* (0.072)		-0.164** (0.077)	
FDI			-0.051*** (0.012)		-0.056*** (0.014)	
GDP per Capita	-0.126 (0.113)	-0.103 (0.113)	-0.193* (0.098)	-0.129 (0.117)	-0.109 (0.118)	-0.198** (0.097)
Growth	-0.030*** (0.004)	-0.030*** (0.004)	-0.018*** (0.006)	-0.031*** (0.004)	-0.031*** (0.004)	-0.018*** (0.006)
Inflation	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Democracy	0.033* (0.017)	0.028 (0.018)	0.033* (0.019)	0.032* (0.018)	0.026 (0.018)	0.034* (0.020)
Democracy Sq.	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Violent Conflict	0.022 (0.040)	0.047 (0.036)	0.022 (0.038)	0.019 (0.043)	0.047 (0.039)	0.011 (0.042)
Population	-0.100 (0.151)	0.022 (0.127)	-0.213 (0.162)	-0.184 (0.196)	-0.078 (0.170)	-0.345 (0.214)
Time Trend	0.009** (0.004)	0.008** (0.004)	0.012*** (0.003)	0.012* (0.006)	0.012** (0.006)	0.017*** (0.005)
Number of Obs.	4400	4282	3965	3551	3433	3194
Number of Countries	138	134	145	114	110	121
R-squared	0.126	0.138	0.095	0.127	0.142	0.097

Robust standard errors adjusted for clustering over country appear in parentheses

*** $p < 0.01$

** $p < 0.05$

* $p < 0.1$. All time-variant explanatory variables are lagged at $t-1$

economy in two countries, India and Chile, from our sample in Fig. 1 for the years spanning 1995 to 2010. In terms of openness and shadow economies, India and Chile are somewhat different – Chile has been an advocate of free-market reforms since the 1980s, is the most globalized country in Latin America (Guion 2012) and has the smallest shadow economy in the region (Schneider 2005). India has also been liberalizing its economy since the 1980s, including the dismantling of the antiquated and inefficient “Raj” system of licensing businesses (e.g., Riley and Roy 2016). However, it has faced an uphill battle against so-called “black money.” Despite drastic measures, which included the surprise movement of large-denomination bills out of circulation in

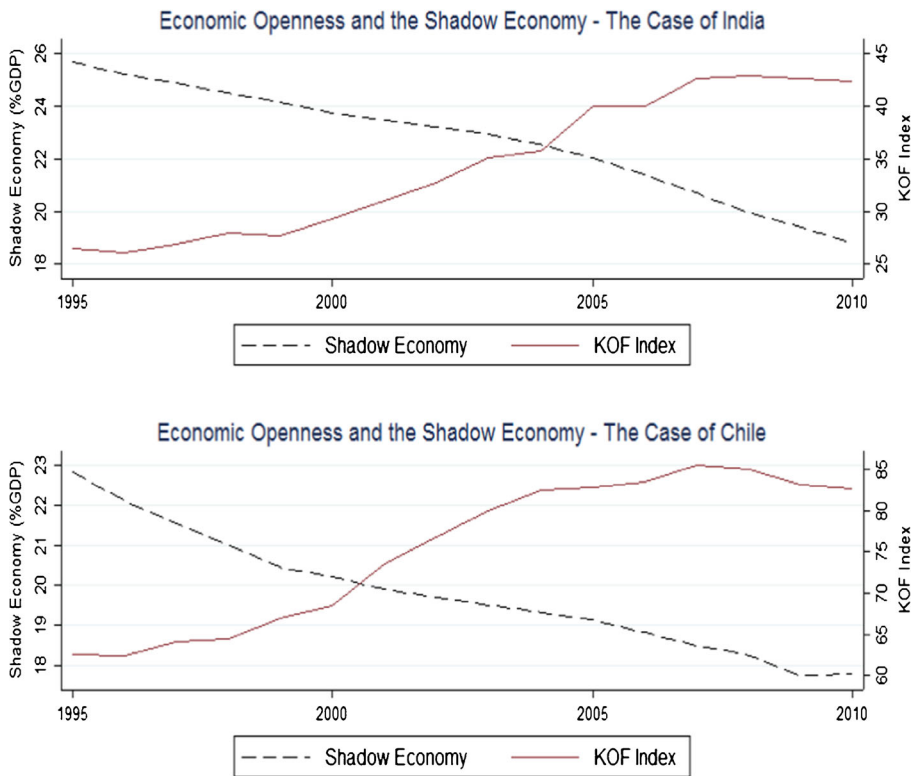


Fig. 1 Economic Openness and the Growth of the Informal Economy in India and Chile

2016, its shadow economy is still a major problem (e.g., Mannepilli 2017). However, as these figures demonstrate, the globalization efforts of both countries have been accompanied by lower growth in their illicit economies.

More specifically, the first graph indicates that the size of India's shadow sector has declined by about 27% (from about 26 to 19) while its *KOF Index* score went up by about 62% (from about 26 to 42) during the 1995–2010 period. We observe a similar trend in Chile in the second graph: as Chile became more economically globalized over time, the size of its shadow economy decreased significantly. Hence, though both countries are at different places in terms of both globalization and in combatting their respective shadow economies, these figures do connote similar dynamics at work, that is that increased globalization can occur with a shrinking shadow economy.

In Table 2, we assess the effects of IMF program participation on the shadow sector. In contrast to the results of the previous model, we find that IMF program participation in general as well as the number of structural conditions attached to those programs are significantly related to greater growth in illicit economic exchanges during the IMF program years. This finding is significant across all models, indicating that it is robust to the choice of the sample. This suggests that the economic downturn, reduction in credit markets, and reduced state capacity brought about by the IMF programs can push actors into the shadow economy, due to economic hardships as well as decreased benefits for remaining in the formal economy.

Table 2 The Impact of IMF Programs on the Change in the Shadow Economy (Fixed-Effects Models)

	Global Sample		Non-OECD Countries	
IMF Programs (0–1)	0.122*** (0.034)		0.126*** (0.037)	
IMF Structural Conditions+		0.003** (0.001)		0.004** (0.001)
KOF Index	-0.005* (0.003)	-0.003 (0.002)	-0.007** (0.003)	-0.004 (0.003)
GDP per Capita	-0.091 (0.112)	-0.183 (0.114)	-0.095 (0.116)	-0.173 (0.120)
Growth	-0.030*** (0.004)	-0.024*** (0.004)	-0.030*** (0.004)	-0.024*** (0.004)
Inflation	0.000* (0.000)	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)
Democracy	0.032* (0.018)	0.025 (0.017)	0.031* (0.018)	0.024 (0.017)
Democracy Sq.	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Violent Conflict	0.020 (0.039)	0.046 (0.039)	0.017 (0.043)	0.050 (0.042)
Population	-0.132 (0.156)	-0.483*** (0.151)	-0.228 (0.207)	-0.496*** (0.185)
Time Trend	0.009** (0.004)	0.007* (0.004)	0.013* (0.006)	0.007 (0.006)
Number of Obs.	4325	3787	3495	3064
Number of Countries	137	137	113	113
R-squared	0.133	0.117	0.134	0.117

Robust standard errors adjusted for clustering over country appear in parentheses

*** $p < 0.01$

** $p < 0.05$

* $p < 0.1$. All time-variant explanatory variables are lagged at $t-1$

+ The time frame for the models controlling for the IMF Structural Conditions variable is 1981–2012

We use two cases, Togo (1979–1998) and Tunisia (1986–1992), from our sample in Fig. 2 to further illustrate the extent of the change a country might observe in the size of its shadow sector during the IMF years. Both countries received IMF loans in order to address budgetary and other financial problems, and both cases show a notable increase in the shadow sector growth prior to as well as after the end of their IMF program participation. In the case of Togo, for instance, there was about an 18% increase (from 28 to 33) in the size of the shadow economy between the early years and last year of the IMF participation. The case of Tunisia is particularly interesting in this regard, as the IMF once deemed it one of the “most successful of economic reformers in the Arab World” (Pfeifer 1999: 23). Yet although Tunisia attained some

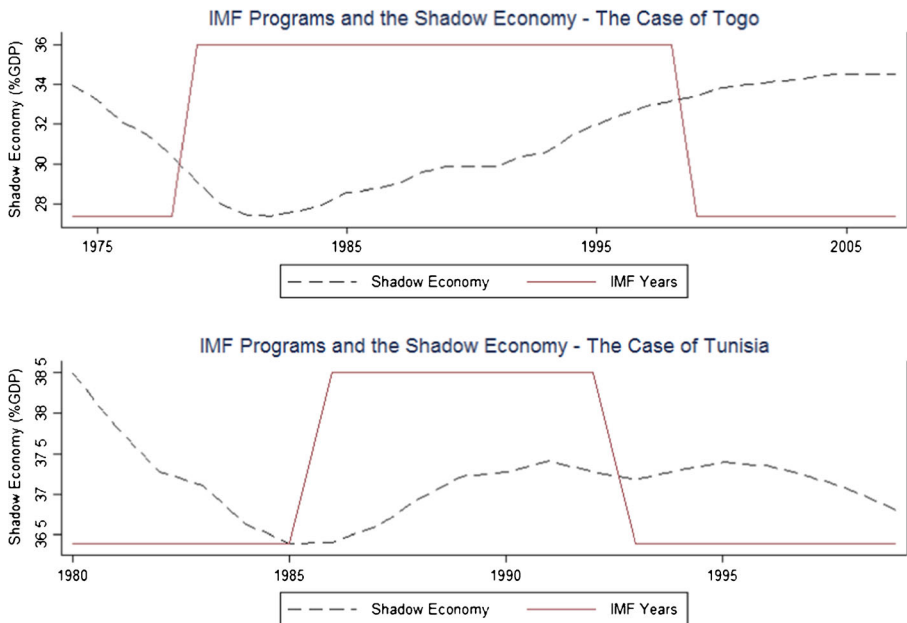


Fig. 2 IMF Program Participation and the Size of the Shadow Economy in Togo and Tunisia

positive economic outcomes due to its reforms, particularly reducing inflation, the austerity measures failed to resolve many of Tunisia's underlying political and economic problems, as unemployment stayed very high and its investment in human capital remained low (Pheifer 1999). Problems with the informal economy continued, as the sector has continued to grow, due to both the continued scarcity of formal work and much higher income opportunities in the shadow economy. This forced Tunisian workers to choose “between making a living and taking high risks” in the shadow sector (Trabelssi 2014: 4).

The results for the control variables are largely in line with extant literature. Specifically, we find that economic growth is likely to have a significant negative effect on informal economic activity. We also find in some models that higher inflation rates are likely to lead to more growth in the informal economy. The results for the democracy and democracy squared measures in some models confirm the expectation that mixed regimes, which are often more prone to political instability, are more likely to experience growth in their informal economies. Somewhat surprisingly, we find that the population variable is significant in only two of the models with a negative coefficient sign.

5 Conclusion

In order to understand the impact of increasing levels of international economic engagement that have occurred via various forms of globalization, it is necessary to look both at the formal and informal sectors of countries' economies. The existence of the informal sector often connotes a dysfunctional relationship between states and

markets, and the expansion of this sector can undermine the legitimacy of countries' economic policies and institutions. To a large extent, the decision to enter the shadow sector represents a rejection of a countries' formal economy, as individuals and firms forgo the potential benefits of state governance and accept the costs of operating outside of extant regulations and protections. By assessing the relationship between two forms of international economic engagement and changes in the size of countries' shadow economies, we provide insights into how integration into the broader global economy influences this failure of the formal marketplace.

As global economic integration is a multifaceted phenomenon that can have varied impacts upon countries, we examined how economic openness ("globalization from below") and participation in IMF ("globalization from above") affect the growth of the shadow sector. We argued that increased commercial integration into the global marketplace would lead countries' shadow sectors to contract—evaluating two specific mechanisms. First, we argued that the removal of trade barriers would reduce incentives for illicit trade, diminishing firms' incentives for exploiting the shadow sector. Secondly, increased exposure to foreign firms and capital would bring with it a "climb to the top" effect that could improve countries' regulatory environments and labor standards, increasing the incentives for both firms and workers to operate in the formal sector. Conversely, we argued that participation in IMF programs would have the opposite effect, as the economic downturns and weakened state capacity wrought by IMF programs could increase participation in the shadow sector. Examining these relations across 145 countries for over 40 years, we found substantially significant evidence that greater economic openness tends to cause shadow sectors to contract, while participation in IMF programs appears to promote the growth of shadow sectors.

Most directly, our work expands upon the growing body of research into the causes of the shadow economy. Much of the literature in this area posits that a symbiotic relationship exists between the global economy and the shadow sector—integration into global markets further develops the informal "fringes" of formal markets (McMichael 2000), and both illicit and licit markets can readily utilize the "dual use" (Gilman et al. 2011: 3; see also Naim 2005) nature of global economic infrastructure and networks. However, we find that a more complex dynamic exists between economic globalization and the expansion of the shadow sector.

Overall, we uncover some reasons for optimism regarding the impact of increasing levels of international economic engagement. Countries that reduce their trade barriers and increase international trade and investment can expect to see the size of their shadow sectors decline. While formal and informal sectors certainly coexist, and the spread of the illicit markets may involve similar dynamics to that of legitimate commerce, increased participation in cross-border economic interactions can remove some of the incentives to participate in the shadow economy. Though shadow sectors will still exist in countries with highly open economies, their growth does not keep pace with that of the formal sector.

At the same time, other forms of international economic engagement might undermine the formal sector. Rather than strengthening countries' formal markets, the reforms required as part of IMF program participation appear to undermine formal markets and drive individuals and businesses into the shadow sector. Thus, we corroborate and expand extant work on the negative economic impacts of IMF programs, as

well as their deleterious effects on political and economic rights (i.e., Blanton et al. 2015; Oberdabernig 2013; Abouharb and Cingranelli 2007). Moreover, though IMF programs often stipulate measures to increase government revenues through effective taxation (Reinsberg et al. 2016; see also Stone 2002), our findings imply that these programs may have the opposite effect on these revenues, as they drive firms and individuals into the informal sector. Hence, to the extent that the shadow economy represents a failure of the formal marketplace, our findings indicate that IMF programs may serve to exacerbate these problems. The broader implication here is that while more market-driven aspects of globalization expand the formal economy, increased exposure to globalization “from above” often serves to decrease the role and legitimacy of a state in governing its economy, and thus contribute to the growth of the shadow sector.

Indeed, the IMF has increasingly begun to recognize some of the problems inherent with its programs. One report, for example, admitted that the IMF’s neoliberal policy prescriptions may have been “oversold” (Ostry et al. 2016). Moreover, it has made recent moves to recognize and address related issues. One report (Jaumotte and Buitron 2015) argues for the importance of strong collective bargaining regimes, while another admitted that their attention to corruption in recipient countries “has not been entirely even” (International Monetary Fund 2017: 2). The self-assessments appear to be long overdue, as the structural conditions IMF programs impose appear to exacerbate the problems that they are ostensibly designed to remedy.

It is valuable to acknowledge some limitations to our analysis that future work can expand upon. Estimating the size of shadow economies is incredibly challenging endeavor and economists have developed multiple strategies for accomplishing this difficult task. Yet while this data enables researchers to examine the shadow economy writ large, there are obviously many separate facets of the shadow economies that may reflect different political and economic dynamics within countries. Perhaps further data can enable more detailed analysis of specific aspects of shadow sectors, such as the prevalence of informal labor, illicit finance, or smuggling. Moreover, valuable insights could be gained through closer assessments of various types of economic interactions; for example, does foreign investment in the services influence the illicit economy differently than foreign investment in natural resource sectors? Similarly do trade specializations have different impacts upon illicit trade? In all, we see significant value in additional research that can expand upon the empirical foundations of our study with the use of differing measures for shadow sector activity and different measures of economic openness.

While we have provided a broad inquiry into the two main types of international economic engagement, our study has clearly not explored all of the mechanisms by which international economic relationships can influence countries’ shadow economies. Future work could explore the role that international legal commitments play in shaping the growth of countries’ shadow sectors. For example, could countries influence the size of their shadow economies by joining the GATT/World Trade Organization or joining preferential trade agreements? Additional research could also explore the potential effects of foreign aid as another form of external economic influence on recipient countries’ shadow economies. A lot more remains to be understood about how the various mechanisms of globalization can drive increasing amounts of economic activity into or out of the shadow sector.

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Appendix

Table 3 Summary Statistics

	Obs	Mean	Std. Dev.	Min	Max
Shadow Economy	4400	34.103	13.617	7.965	81.692
Δ Shadow Economy	4400	-0.264	0.547	-5.760	2.559
KOF Index	4400	50.327	19.545	9.239	99.159
KOF Restrictions	4282	49.673	23.737	4.287	98.261
Trade (logged)	3965	4.163	0.558	1.844	6.096
FDI (logged)	3965	0.155	1.746	-13.552	5.152
IMF Programs	4325	0.385	0.487	0	1
IMF Structural Conditions	3787	3.105	7.224	0	94
GDP per Capita (logged)	4400	7.818	1.626	4.727	11.382
Growth	4400	3.556	5.228	-50.248	39.487
Inflation	4400	52.635	602.722	-29.173	26,762.020
Democracy	4400	12.207	7.163	0	20
Democracy Sq.	4400	200.309	159.804	0	400
Violent Conflict	4400	0.212	0.503	0	2
Population (logged)	4400	16.090	1.548	12.626	21.009
Time Trend	4400	1994.865	10.703	1975	2012

Table 4 List of Countries

Albania	Eritrea	Luxembourg	Solomon Islands
Algeria	Estonia	Macedonia	South Africa
Angola	Ethiopia	Madagascar	Spain
Argentina	Fiji	Malawi	Sri Lanka
Armenia	Finland	Malaysia	Sudan
Australia	France	Mali	Suriname
Austria	Gabon	Mauritania	Swaziland
Azerbaijan	Gambia	Mauritius	Sweden
Bahrain	Georgia	Mexico	Switzerland
Bangladesh	Germany	Moldova	Syria
Belarus	Ghana	Mongolia	Tajikistan
Belgium	Greece	Morocco	Tanzania
Benin	Guatemala	Mozambique	Thailand
Bhutan	Guinea	Namibia	Togo

Table 4 (continued)

Bolivia	Guinea-Bissau	Nepal	Tunisia
Botswana	Guyana	Netherlands	Turkey
Brazil	Haiti	New Zealand	United Arab Emirates
Bulgaria	Honduras	Nicaragua	Uganda
Burkina Faso	Hungary	Niger	Ukraine
Burundi	India	Nigeria	United Kingdom
Cambodia	Indonesia	Norway	United States
Cameroon	Iran	Oman	Uruguay
Canada	Ireland	Pakistan	Venezuela
Cape Verde	Israel	Panama	Zambia
Central Afr Rep	Italy	Papua New Guinea	Zimbabwe
Chad	Ivory Coast	Paraguay	
Chile	Japan	Peru	
China	Jordan	Philippines	
Colombia	Kazakhstan	Poland	
Comoros	Kenya	Portugal	
Congo Brazzaville	South Korea	Qatar	
Congo Kinshasa	Kuwait	Romania	
Costa Rica	Kyrgyzstan	Russia	
Croatia	Laos	Rwanda	
Cyprus	Latvia	Saudi Arabia	
Denmark	Lebanon	Senegal	
Dominican Rep	Lesotho	Sierra Leone	
Ecuador	Liberia	Singapore	
Egypt	Libya	Slovak Republic	
El Salvador	Lithuania	Slovenia	

Table 5 Economic Openness and the Shadow Economy (GMM Models)

	Global Sample		Non-OECD Countries			
KOF Index	-0.026*** (0.008)		-0.037*** (0.008)			
KOF Restrictions		-0.003 (0.004)	-0.012*** (0.005)			
Trade			-1.181*** (0.215)		-1.193*** (0.224)	
FDI			-0.035 (0.025)		-0.041 (0.030)	
GDP per Capita	0.066	-0.119	0.110	0.165	-0.042	0.036

Table 5 (continued)

	Global Sample			Non-OECD Countries		
Growth	(0.130) -0.012*** (0.003)	(0.121) -0.012*** (0.002)	(0.107) -0.006 (0.004)	(0.116) -0.011*** (0.003)	(0.130) -0.014*** (0.002)	(0.120) -0.008* (0.005)
Inflation	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)
Democracy	-0.084 (0.062)	-0.090* (0.053)	0.041 (0.071)	-0.040 (0.051)	-0.057 (0.041)	0.013 (0.065)
Democracy Sq.	0.005 (0.003)	0.005* (0.003)	-0.002 (0.004)	0.003 (0.003)	0.003 (0.002)	-0.000 (0.003)
Violent Conflict	-0.028 (0.070)	-0.024 (0.052)	-0.084 (0.089)	-0.030 (0.077)	0.024 (0.047)	-0.117 (0.093)
Population	-0.092*** (0.035)	-0.008 (0.022)	-0.255*** (0.057)	-0.126*** (0.036)	-0.052* (0.028)	-0.262*** (0.053)
Time Trend	0.018*** (0.005)	0.006** (0.002)	0.019*** (0.004)	0.026*** (0.006)	0.015*** (0.004)	0.020*** (0.005)
Number of Obs.	4400	4282	3965	3551	3433	3194
Number of Countries	138	134	145	114	110	121
Wald Chi2	68.26	54.68	54.84	87.17	85.91	60.86

Robust standard errors in parentheses

***p < 0.01

**p < 0.05

*p < 0.1. All time-variant explanatory variables are lagged at t-1

Table 6 IMF Programs and the Shadow Economy (GMM Models)

	Global Sample		Non-OECD Countries	
IMF Programs (0–1)	0.555*** (0.136)		0.607*** (0.150)	
IMF Structural Conditions		0.006** (0.003)		0.007** (0.003)
KOF Index	-0.031*** (0.006)	-0.021*** (0.006)	-0.039*** (0.007)	-0.028*** (0.007)
GDP per Capita	0.238** (0.094)	0.101 (0.089)	0.310** (0.127)	0.124 (0.108)
Growth	-0.011*** (0.003)	-0.011*** (0.003)	-0.011*** (0.003)	-0.010*** (0.003)
Inflation	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Democracy	-0.067 (0.046)	-0.062 (0.040)	-0.037 (0.046)	-0.046 (0.041)

Table 6 (continued)

	Global Sample		Non-OECD Countries	
Democracy Sq.	0.004 (0.002)	0.004* (0.002)	0.002 (0.002)	0.003 (0.002)
Violent Conflict	-0.003 (0.065)	-0.018 (0.056)	0.023 (0.079)	-0.024 (0.066)
Population	-0.082** (0.035)	-0.078*** (0.029)	-0.120*** (0.039)	-0.109*** (0.034)
Time Trend	0.019*** (0.004)	0.007* (0.004)	0.025*** (0.005)	0.011** (0.005)
Number of Obs.	4325	3787	3495	3064
Number of Countries	137	137	113	113
Wald Chi2	114.2	75.66	116.32	94.21

Robust standard errors in parentheses

***p < 0.01

**p < 0.05

*p < 0.1. All time-variant explanatory variables are lagged at t-1

References

- Abouharb, M. R., & Cingranelli, D. (2007). *Human rights and structural adjustment*. Cambridge: Cambridge University Press.
- Adolph, C., Quince, V., & Prakash, A. (2017). The Shanghai Effect: Do Exports to China Affect Labor Practices in Africa? *World Development*, 89, 1–18.
- Andreas, P. (2004). Illicit international political economy: The clandestine side of globalization. *Review of International Political Economy*, 11(3), 641–652.
- Asiedu, E., & Lien, D. (2011). Democracy, foreign direct investment and natural resources. *Journal of International Economics*, 84(1), 99–111.
- Autio, E., & Fu, K. (2015). Economic and political institutions and entry into formal and informal entrepreneurship. *Asia Pacific Journal of Management*, 32(1), 67–94.
- Awasthi, R. (2016). Chasing Shadows: Tax Strategies to Tackle the Shadow Economy. *World Bank*. Available at: <http://blogs.worldbank.org/governance/chasing-shadows-tax-strategies-tackle-shadow-economy>. Accessed January 28, 2017.
- Bai, J., & Ng, S. (2010). Instrumental Variables Estimation in a Data Rich Environment. *Econometric Theory*, 26(6), 1577–1606.
- Bajada, C., & Schneider, F. (2009). Unemployment and the Shadow Economy in the OECD. *Revue Économique*, 60(9), 1033–1067.
- Bas, M. A., & Stone, R. W. (2014). Adverse selection and growth under IMF programs. *The Review of International Organizations*, 9(1), 1–28.
- Bator, P. M. (1982). An essay on the international trade in art. *Stanford Law Review*, 1, 275–384.
- Baum, C. F., Schaffer, M. E., & Stillman, S. (2003). Instrumental variables and GMM: Estimation and testing. *Stata Journal*, 3(1), 1–31.
- BBC. (2013). Who, what, why: Why do criminals smuggle garlic? (12 January). Available at: <http://www.bbc.com/news/magazine-20976887>. Accessed September 17, 2017.
- Blanton, S. L., & Blanton, R. (2007). What Attracts Foreign Investors? An Examination of Human Rights and Foreign Direct Investment. *Journal of Politics*, 69(1), 143–155.
- Blanton, R. G., & Blanton, S. L. (2015). Is foreign direct investment “Gender Blind”? Women’s rights as a determinant of US FDI. *Feminist Economics*, 21(4), 61–88.
- Blanton, R., & Blanton, S. L. (2016). Globalization and collective labor rights. *Sociological Forum* 31 (1), 181–202).

- Blanton, R., Blanton, S., & Peksen, D. (2015). The Impact of IMF and World Bank Programs on Labor Rights. *Political Research Quarterly*, 68(2), 377–391.
- Campbell, E. (2005). Formalizing the informal economy: Somali refugee and migrant trade networks in Nairobi. In *Global migration perspectives 47*. Geneva: Global Commission on International Migration.
- Copelovitch, M. S. (2010). Master or servant? Common agency and the political economy of IMF lending. *International Studies Quarterly*, 54(1), 49–77.
- Dreher, A. (2006). Does globalization affect growth? Evidence from a new index of globalization. *Applied Economics*, 38(10), 1091–1110.
- Dreher, A., & Schneider, F. (2010). Corruption and the shadow economy: An empirical analysis. *Public Choice*, 144, 215–238.
- Drezner, D. W. (2000). Bottom feeders. *Foreign Policy*, 121, 64–70.
- Easterly, W. (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), 1–22.
- Eilat, Y., & Zinnes, C. (2002). The shadow economy in transition countries: Friend or Foe? A policy perspective. *World Development*, 30(7), 1233–1254.
- Elbahnasawy, N., Ellis, M., & Adom, A. (2016). Political instability and the informal economy. *World Development*, 85, 31–42.
- Elgin, C., & Oztunali, O. (2012). Shadow economies around the world: model based estimates. *Bogazici University Department of Economics Working Papers*, 5(2012), 1–48.
- Falk, R. (1999). *Predatory globalization: A critique*. Cambridge: Polity.
- Feige, E. (1989). *The Underground Economies: Tax Evasion and Information Distortion*. Cambridge: Cambridge University Press.
- Feige, E. L. (1990). Defining and estimating underground and informal economies: The new institutional economics approach. *World Development*, 18(7), 989–1002.
- Friedman, E., Johnson, S., Kaufmann, D., & Zoido-Lobaton, P. (2000). Dodging the grabbing hand: the determinants of unofficial activity in 69 countries. *Journal of Public Economics*, 76(3), 459–493.
- Gilman, N et al. (2011). Introduction. In Gilman et al (ed) *Deviant Globalization*, New York: Continuum, 1–27.
- Gleditsch, N. P., Wallensteen, P., Eriksson, M., Sollenberg, M., & Strand, H. (2002). Armed conflict 1946–2001: A new dataset. *Journal of Peace Research*, 39(5), 615–637.
- Goel, R. K., & Saunoris, J. W. (2014). Global corruption and the shadow economy: Spatial aspects. *Public Choice*, 161(1–2), 119–139.
- Gomis, B., & Botero, N. C. (2016). Sneaking a Smoke: Paraguay’s Tobacco Business Fuels Latin America’s Black Market. *Foreign Affairs* (February 5). Available at: <https://www.foreignaffairs.com/articles/paraguay/2016-02-05/sneaking-smoke>. Accessed September 17, 2017
- Greenhill, B., Mosley, L., & Prakash, A. (2009). Trade-based diffusion of labor rights: A panel study, 1986–2002. *American Political Science Review*, 103(4), 169–190.
- Guion, P. (2012). Chile is the most globalized economy in Latin America, says Ernst and Young. *MercoPress* (Jan 25). Available at <http://en.mercopress.com/2012/01/25/chile-the-most-globalized-economy-in-latin-america-says-ernst-young>. Accessed September 25, 2017
- Hafner-Burton, E. M. (2005). Trading Human Rights: How Preferential Trade Agreements Influence Government Repression. *International Organization*, 59, 593–629.
- Hamilton, G. (2013). The Maple Syrup Cartel. *National Post*. Available at <http://news.nationalpost.com/news/canada/the-maple-syrup-cartel-quebecs-syrup-monopoly-helped-spawn-smuggling-prohibition-style>. Accessed September 17, 2017.
- Hayakawa, K. (2009). A simple efficient instrumental variable estimator for panel AR(p) models when both N and T are large. *Econometric Theory*, 25, 873–890.
- International Labour Office (ILO). (2002). *Decent Work and the Informal Economy: Report VI of the 90th Session of the International Labour Conference*. Geneva: ILO.
- International Monetary Fund. (2017). *The role of the fund in governance issues*. IMF Policy Paper 080217. Available at <http://www.imf.org/en/Publications/Policy-Papers/Issues/2017/08/01/pp080217-the-role-of-the-fund-in-governance-issues-review-of-the-guidance-note>. Accessed: December 10, 2017.
- Jaumotte, F., & Buitron, C. O. (2015). Power from the people. *Finance & Development*, 52(1), 29–31.
- Johnson, S., Kaufmann, D., & Zoido-Lobaton, P. (1998). Regulatory discretion and the unofficial economy. *The American Economic Review*, 88(2), 387–392.
- Kentikelenis, A. E., Stubbs, T. H., & King, L. P. (2016). IMF conditionality and development policy space, 1985–2014. *Review of International Political Economy*, 23(4), 543–582.
- Knack, S., & Keefer, P. (1998). *IRIS-3 file for international country risk guide data codebook*. College Park: PRS Group.

- Kosack, S., Ranis, G., & Vreeland, J. (2004). *Globalization and the Nation State: The impact of the IMF and the World Bank*. New York: Routledge.
- Krueger, A. O. (1974). The Political Economy of the Rent-Seeking Society. *The American Economic Review*, 64(3), 291–303.
- Kucera, D. (2002). Core Labor Standards and Foreign Direct Investment. *International Labour Review*, 141(1), 31–70.
- Loayza, N. (1997). *The Economics of the Informal Sector. Policy Research Working Paper*. Washington, DC: World Bank.
- Loayza, N., & Rigolini, J. (2011). Informal Employment: Safety Net or Growth Engine? *World Development*, 39(9), 1503–1515.
- Mannepalli, A. (2017). Was India's demonetization a failure? *The Diplomat* (Sept. 18). Available at <https://thediplomat.com/2017/09/is-indias-demonetization-a-failure/>. Accessed September 25, 2017.
- Marshall, M., Jagers, K., & Gurr, T. (2012). *Polity IV Project*. Center for Systemic Peace. Available at www.systemicpeace.org/polity. Accessed February 15, 2017
- McMichael, P. (2000). *Development and Social Change: a Global Perspective*. Thousand Oaks: Pine Forge Press.
- Mishra, P., Subramanian, A., & Topalova, P. (2008). Tariffs, enforcement, and customs evasion: Evidence from India. *Journal of Public Economics*, 92(10), 1907–1925.
- Moran, T. (2011). *Foreign Direct Investment and Development: Launching a Second Generation of Research*. Washington, DC: Peterson Institute for International Economics.
- Mosley, L. (2010). *Labor rights and multinational production*. New York: Cambridge University Press.
- Naim, M. (2005). *Illicit: How Smugglers, Traffickers and Copycats are Hijacking the Global Economy*. New York: Knopf Doubleday.
- Neuwirth, R. (2011). The Shadow Sector. *Foreign Policy Online*. Available at: <http://foreignpolicy.com/2011/10/28/the-shadow-superpower/>. Accessed January 28, 2017
- Noorbakhsh, F., Paloni, A., & Youssef, A. (2001). Human Capital and FDI Inflows to Developing Countries: New Empirical Evidence. *World Development*, 29(9), 1593–1610.
- Nooruddin, I., & Woo, B. (2015). Heeding the Sirens: The Politics of IMF Program Participation. *Political Science Research and Methods*, 3(1), 73–93.
- Oberdabernig, D. A. (2013). Revisiting the effects of IMF programs on poverty and inequality. *World Development*, 46, 113–142.
- Orsi, R., Raggi, D., & Turino, F. (2012). Estimating the size of the underground economy: A DSGE Approach. Working Papers wp818, Dipartimento Scienze Economiche, Università di Bologna.
- Ostry, J., Loungani, P., & Furceri, D. (2016). Neoliberalism: Oversold? *Finance and Development*, 53, 38–41.
- Pfeifer, K. (1999). How Tunisia, Morocco, Jordan and even Egypt became IMF "Success Stories" in the 1990s. *Middle East Report*, 210, 23–27.
- Planet Money. (2017). "The Phone at the End of the World." *NPR*. Available at: <http://www.npr.org/sections/money/2017/02/17/515850029/episode-755-the-phone-at-the-end-of-the-world>. Accessed September 15, 2017
- Prakash, A., & Potoski, M. (2007). Investing Up: FDI and the Cross-National Diffusion of ISO 14001. *International Studies Quarterly*, 51(3), 723–744.
- Przeworski, A., & Vreeland, J. R. (2000). The effect of IMF programs on economic growth. *Journal of Development Economics*, 62(2), 385–421.
- Reinsberg, B., Kentikelenis, A., Stubbs, T., & King, L. (2016). *Structural adjustment and state capacity: Evidence from IMF programs*. Mimeo: University of Cambridge.
- Riley, P., & Roy, R. K. (2016). Corruption and anticorruption: The case of India. *Journal of Developing Societies*, 32(1), 73–99.
- Roodman, D. (2009). How to do xtabond2: An Introduction to "Difference" and "System" GMM in STATA. *Stata Journal*, 9(1), 86–136.
- Schneider, F. (2005). Shadow economies around the world: What do we really know? *European Journal of Political Economy*, 21, 598–642.
- Schneider, F., & Williams, C. (2013). *The Shadow Economy*. London: Institute of Economic Affairs.
- Schneider, F., Buehn, A., & Montenegro, C. E. (2010). Shadow Economies all over the World: New Estimates for 162 Countries from 1999 to 2007. *World Bank Policy Research Working Paper Series*.
- Steinwand, M. C., & Stone, R. W. (2008). The international monetary fund: A review of the recent evidence. *The Review of International Organizations*, 3(2), 123–149.
- Stiglitz, J. (2004). Capital-Market Liberalization, Globalization, and the IMF. *Oxford Review of Economic Policy*, 20, 57–71.

- Stone, R. W. (2002). *Lending Credibility: The International Monetary Fund and the PostCommunist Transition*. Princeton: Princeton University Press.
- Tajima, Y. (2014). *The Institutional Origins of Communal Violence: Indonesia's Transition from Authoritarian Rule*. New York: Cambridge University Press.
- Trabelssi, K. (2014). Current State of the Informal Economy in Tunisia as Seen Through its Stakeholders. *The Solidarity Center*. Available at https://www.solidaritycenter.org/wp-content/uploads/2014/11/Tunisia.Informal-Economy-Report.UGTT_2014.ENGLISH.pdf. Accessed September 25, 2017
- Vézina, P. L. (2015). Illegal trade in natural resources: evidence from exports. *International Economics*, 142, 152–160.
- Vogel, D. (1997). Trading up and governing across: transnational governance and environmental protection. *Journal of European Public Policy*, 4(4), 556–571.
- Vreeland, J. R. (2003). *The IMF and Economic Development*. Cambridge: Cambridge University Press.
- Vreeland, J. R. (2008). The effect of political regime on civil war: Unpacking anocracy. *Journal of Conflict Resolution*, 52(3), 401–425.
- Walker-Guevara, M., Rehnfeldt, M., & Soares, M. (2009). Smuggling made easy: Landlocked Paraguay emerges as a top producer of contraband tobacco. In D. Kaplan (Ed.), *Tobacco underground: The global trade in smuggled cigarettes* (pp. 56–70). Washington DC: Center for Public Integrity.
- World Bank. (2016). *World Development Indicators*. Washington, DC: World Bank.