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Cheap talk? Financial sanctions and non-financial activity

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Non-technical summary

Research Question

This paper examines the effect of financial sanctions on the country imposing them. In particular, we analyze the business responses of German non-financial entities to the imposition of sanctions on 23 countries over the period from 1999 through 2014.

Contribution

We begin with an analysis of the direct costs of sanctions in terms of cross-border business that is lost using monthly balance of payments transactions between January 1999 and December 2014. Next, we characterize non-financial firms affected by sanctions in more detail. The transaction data also enable us to explore the response of sanctions-affected declarants directly. In particular, we aim to identify possible sanctions evasion behavior by non-financial reporting units. Finally, we examine the impact of sanctions on firm-level variables such as total sales and the number of employees using corporate balance sheet data.

Results

We find four key results. First, German financial activities with sanctioned countries are sizably reduced after the imposition of sanctions, with strong reductions in the scope of cross-border activities (i.e., the extensive margin with fewer firms and fewer asset categories) and less statistically robust results for total financial flows (sum of inflows and outflows) which is consistent with the concept of ‘smart sanctions’. Second, firms doing business with sanctioned countries tend to be disproportionately large, making them largely immune to the reduction in business opportunities with individual partners. Third, firms affected by sanctions expand their activities with non-sanctioned countries, some of which display close trade ties to the sanctioned country. Fourth, we find no effect of sanctions on aggregate variables of firm performance such as employment or total sales. Overall, we conclude that the economic costs of financial sanctions to the sender country are limited.

Nichttechnische Zusammenfassung

Fragestellung

Die vorliegende Arbeit untersucht, wie sich Finanzsanktionen auf das Senderland auswirken. Dazu analysieren wir die Reaktionen deutscher nicht-finanzieller Unternehmen auf die Einführung von Sanktionen gegen 23 Länder im Zeitraum von 1999 bis 2014.

Beitrag

Wir analysieren zunächst die direkten Kosten von Sanktionen im Hinblick auf den Umfang grenzüberschreitender Geschäfte, indem wir monatliche Transaktionsdaten aus der Zahlungsbilanz zwischen Januar 1999 und Dezember 2014 auswerten. Danach charakterisieren wir die nicht-finanziellen Unternehmen, die von Sanktionen betroffen sind, im Detail. Die Transaktionsdaten ermöglichen uns zudem, die Reaktionen von nicht-finanziellen Unternehmen zu untersuchen, die direkt von den Sanktionsmaßnahmen betroffen sind und ein mögliches Ausweichverhalten dieser Unternehmen zu identifizieren. Schließlich untersuchen wir die Auswirkungen von Sanktionen auf firmenspezifische Kennziffern wie Gesamtumsätze und Mitarbeiteranzahl mit Hilfe der Unternehmensbilanzstatistik.

Ergebnisse

Wir erhalten vier Hauptergebnisse. Erstens werden deutsche Finanzaktivitäten mit sanktionierten Ländern nach der Einführung restriktiver Maßnahmen deutlich eingeschränkt. Dies erfolgt vor allem über einen starken Rückgang der grenzüberschreitenden Aktivitäten am extensiven Rand (z.B. weniger Unternehmen und weniger Vermögensklassen) und statistisch weniger robust bei den gesamten Finanzströmen (Summe aus Mittelzu- und -abflüssen), was mit dem Konzept gezielter Sanktionen konsistent ist. Zweitens sind Unternehmen, die Geschäfte mit sanktionierten Ländern tätigen, größer und international aktiver, so dass sie eine Verringerung der Geschäftsaktivitäten mit einzelnen Partnern besser abfedern können. Drittens erweitern von Sanktionen betroffene Unternehmen ihre Aktivitäten mit nicht sanktionierten Ländern, welche wiederum zum Teil enge Handelskontakte mit den sanktionierten Ländern unterhalten. Viertens finden wir keinen Effekt von Sanktionen auf Variablen der Unternehmensleistung wie Beschäftigung oder Gesamtumsatz. Insgesamt kommen wir zu dem Schluss, dass die wirtschaftlichen Kosten von Finanzsanktionen für das Senderland eher begrenzt sind.

Cheap Talk? Financial Sanctions and Non-Financial Activity¹

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Abstract

Sanctions restrict cross-border interactions and, therefore, not only put political and economic pressure on the target country, but they also adversely affect the sender country. This paper examines the effect of financial sanctions on the country imposing them. In particular, we analyze the business responses of German non-financial entities to the imposition of sanctions on 23 countries over the period from 1999 through 2014. Examining highly disaggregated, monthly data from the German balance of payments statistics, we find four main results. First, German financial activities with sanctioned countries are sizably reduced after the imposition of sanctions, with strong reductions in the scope of cross-border activities (i.e., the extensive margin with fewer firms and fewer asset categories) and less statistically robust results for total financial flows (sum of inflows and outflows) which is consistent with the concept of ‘smart sanctions’. Second, firms doing business with sanctioned countries tend to be disproportionately large, making them largely immune to the reduction in business opportunities with individual partners. Third, firms affected by sanctions expand their activities with non-sanctioned countries, some of which display close trade ties to the sanctioned country. Fourth, we find no effect of sanctions on aggregate variables of firm performance such as employment or total sales. Overall, we conclude that the economic costs of financial sanctions to the sender country are limited.

Keywords: sanction; restriction; cross-border transaction

JEL-Classification: F20; F36; F38; F51

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1. Introduction

Sanctions are a popular instrument in international diplomacy. The European Union, for instance, currently imposes restrictive measures on 38 countries and terrorist groups², arguing that sanctions help to promote their foreign policy objectives of “peace, democracy and the respect for the rule of law, human rights and international law”.³ Hufbauer, Schott, Elliott, and Oegg (2007) compile an extensive and repeatedly updated database of sanctions episodes, which, in its most recent version, covers 204 case studies over the period from 1914 to 2006.

Still, despite their frequent use, sanctions are under dispute, for at least two reasons. First, sanctions are typically found to be ineffective in changing the policies of the target country. While both the definition of success as well as the contribution to success made by sanctions depends to a significant degree on subjective evaluation, sanctions often seem to fail to achieve their objectives.⁴ Hufbauer, Schott, Elliott, and Oegg (2007), for instance, using an index ranging from 1 to 16 to assess individual sanctions episodes, classify about one in three cases as successful.⁵ Biersteker, Eckert, Tourinho, and Hudáková (2013, p. 21) are even more pessimistic; they argue that UN targeted sanctions achieve their purposes only 22 percent of the time. More importantly, attempts to identify factors that determine whether or not sanctions are effective often yield inconclusive results; see Kaempfer and Lowenberg (2007) for a review.

Second, sanctions also imply costs for the sender country. The reduction of bilateral relations not only restricts sanctioned entities and their ability to interact, but also limits the business opportunities of the sanctioning country. Consequently, business groups in the sanctions-imposing country typically oppose such measures. When the U.S. government, for instance, considered a tightening of sanctions against Russia in June 2014, the U.S. Chamber of Commerce and the National Association of Manufacturers issued a newspaper advertisement stating that “[w]e are concerned about actions that would harm American

² See the list of restrictive measures in force, available at https://eeas.europa.eu/sites/eeas/files/restrictive_measures-2016-10-11-clean.pdf.

³ Masters (2015) even notes that “because the EU lacks a joint military force, many European leaders consider sanctions the bloc’s most powerful foreign policy tool”.

⁴ Levy (1999) convincingly illustrates this point by discussing different views about the role of trade sanctions in ending the apartheid regime in South Africa.

⁵ For the 204 sanctions episodes listed at <http://www.piiie.com/research/topics/sanctions/sanctions-timeline.cfm>, the average success score is 6.9; see also Table 6.1 in Hufbauer, Schott, Elliott, and Oegg (2007).

manufacturers and cost American jobs. [...] The only effect of such sanctions is to bar U.S. companies from foreign markets and cede business opportunities to firms from other countries.”⁶ German corporate executives are reported to have warned, in similar fashion, against escalating the measures (“German Businesses Urge Halt on Sanctions Against Russia”, The Wall Street Journal, May 1, 2014).

In practice, sanctions affect the sender’s economy in many ways, making quantification of their overall domestic burden difficult. Apart from the immediate reduction in foreign market access, possible costs include the general increase in uncertainty associated with conflict escalation, the risk of countermeasures by the sanctioned country and a long-term loss of the foreign market due to greater competition from non-sanctioning countries. At the other extreme, sender countries may also benefit from the imposition of restrictive measures. Cutting aid or official credits, for instance, implies an immediate reduction in budgetary expenditures, as noted by Hufbauer, Schott, Elliott, and Oegg (2007, p. 108).

In view of these difficulties in identifying the domestic costs of sanctions, empirical studies typically follow, to the extent they address this issue at all, a two-step approach to examine the impact of sanctions on the sender’s economy. In a first step, the effect of sanctions on the targeted economic activity is analyzed. Specifically, since sanctions aim to restrict cross-border interactions, the decline in business with the sanctioned country is quantified, often with a strong focus on bilateral trade. In a second step, based on this estimate, the economic loss to the sanctioning country is calculated. Hufbauer, Elliott, Cyrus, and Winston (1997), for example, examine the costs of unilateral economic sanctions by the United States and estimate that the sanctions may have reduced the country’s exports to 26 target countries by about 15-19 billion US dollars in 1995. Assuming, then, that 1 billion US dollars of exports supported about 13,800 jobs and that there was no offsetting increase in exports to other markets, they argue that this drop translated into a reduction of about 200,000-260,000 jobs. Moreover, since jobs in the export sector pay relatively high wages, they estimate that workers probably lost about 0.8-1.0 billion US dollars in export sector wage premiums.

In this paper, we assess the costs of financial sanctions on the imposing country in more detail. In particular, we examine the effects of financial sanctions on German non-financial entities over the period from 1999 through 2014. During this time, Germany newly

⁶ A copy of the ad is available on the association’s website at <http://www.nam.org/Issues/Trade/NAM-Chamber-Ad.pdf>.

imposed restrictive financial measures on 23 countries, most of which are still in place. More notably, using highly disaggregated, monthly data from the German balance of payments statistics, we are able to identify business units that declared financial transactions with sanctioned countries and, therefore, can be assumed to have been directly affected by the measures. As we are interested in identifying the costs of sanctions beyond the reduction in bilateral financial flows, we focus our analysis on German non-financial declarants. To the extent that financial restrictions have any measurable effect on the economic performance of individual declarants, these effects should be particularly observable for non-financial business entities. For German banks and insurance companies, in contrast, with their large-scale financial operations in major national and international markets, the reduction in business opportunities due to sanctions policies is expected to have generally limited consequences on their overall activities.⁷

We examine the impact of financial sanctions on domestic businesses along various lines. We begin with an analysis of the direct costs of sanctions in terms of cross-border business that is lost. More specifically, we apply a differences-in-differences approach to study changes in German bilateral capital flows with the sanctioned country after the imposition of sanctions. Besedeš, Goldbach and Nitsch (2017) find a strong and immediate decline in cross-border activities with the target country at both the extensive and intensive margins; they estimate, for instance, that after the imposition of financial sanctions German capital flows with the sanctioned country decrease by about 50 percent. When we decompose the effect by the type of declarant, however, we find that the decline in financial flows is dominated by a reduction in foreign activities by German financial institutions. For non-financials, in contrast, the reduction in cross-border business with sanctioned countries is mainly driven by a decline in the scope of activities (i.e., the extensive margin) while the results for total financial flows (i.e., the intensive margin) turn out to be less robust.

Next, we characterize non-financial firms affected by sanctions in more detail. With only few exceptions (e.g., Russia), restrictive financial measures have been primarily imposed on countries of small, even tiny, importance for Germany as counterparts in financial

⁷ Buch and Lipponer (2004) provide a detailed empirical assessment of the international activities of German banks. According to their findings, German banks operating abroad typically expand their business either to realize economies of scale, with particularly strong engagements in OECD countries and major international financial centers, or to reap diversification benefits, reporting payments to (or from) a large portfolio of countries. In either case, business with sanctioned countries is of minor importance for a bank's overall performance.

transactions. Consequently, it is perhaps not surprising that German firms that declared financial transactions with sanctioned countries turn out to be disproportionately large and generally very active in (many) international markets – a finding that is in line with the literature on firm-level exports.⁸ As a result, firms affected by sanctions are expected to have various outside options in response to newly-imposed restrictions.

Our micro data also enable us to explore the response of sanctions-affected declarants directly. In particular, we aim to identify possible sanctions evasion behavior by non-financial reporting units. We find that German firms which declared activities with sanctioned countries in the 12 months before restrictive measures were imposed sizably expand their activities with other countries, some of which display close trade ties to the sanctioned country, potentially indicating sanctions evasion behavior.

Finally, we examine the impact of sanctions on firm-level variables such as total sales and the number of employees. If financial sanctions have any severe consequences for the sanctioning country's economy, as argued, for instance, by national business associations, the costs of sanctions should be observable in these measures. However, the business performance of firms affected by sanctions is not measurably different from that of firms doing business only with non-sanctioned countries. Overall, we find consistent evidence that the costs of financial sanctions on the German economy are, if anything, moderate.

The remainder of the paper is organized as follows. Section 2 reviews some relevant aspects of sanctions and sanction policies, followed by a description of our data. In Section 4, we follow standard practices and examine the effect of financial sanctions on cross-border activities. We then make explicit use of the firm-level dimension of our data set and characterize German non-financial declarants that report business with sanctioned countries in Section 5. In Section 6, we explore firm-level responses to the imposition of sanctions, while Section 7 focuses on the effects of sanctions on aggregate measures of firm performance. Finally, Section 8 provides some concluding comments.

⁸ See, for instance, Bernard, Jensen, Redding, and Schott (2017), Table 5.

2. Financial Sanctions in the European Union

In the European Union (EU), where member states have committed themselves to a Common Foreign and Security Policy, foreign policy instruments are (typically) imposed by the Council of the EU. Among the instruments for external action, financial sanctions became available to EU authorities in 1994. At this time, the Treaty of Maastricht entered into force, which introduced the free movement of capital as a Treaty freedom. Today, Article 63 of the Treaty of the Functioning of the European Union (TFEU) prohibits all restrictions on payments and the movement of capital between member states and between member states and third countries, while Article 215 TFEU allows for the interruption or reduction, in part or completely, of economic and financial relations with one or more third countries.

For our purposes, two features of sanction policies in the European Union are particularly noteworthy. First, while the Council acts by qualified majority, making it difficult, if not impossible, for a single country to veto proposed legislation, regulations are directly applicable in all EU member states and binding in their entirety. As a result, there is only limited scope for potential concerns of endogeneity, where the decision to impose restrictive measures is affected by their expected domestic costs. Still, as the EU implements sanctions either autonomously, at the EU level, or as a result of resolutions of the Security Council of the United Nations (UN), we check for robustness by examining UN sanctions only.

Second, the EU adopts, in practice, a wide range of restrictive measures. These measures often target specific activities; they also include, for instance, restrictions on non-financial activities such as trade embargoes and travel bans. The overwhelming majority of such measures, however, directly and/or indirectly affects cross-border financial relations and is, therefore, also officially recorded as a financial sanction (which is the policy instrument of our interest). Embargoes on exports of specific types of goods, for instance, typically involve restrictions on technical assistance, training and financing; travel bans on named individuals are often accompanied by other restrictive measures, such as the freezing of funds and financial assets. The measures are also regularly reviewed and frequently adjusted. Besedeš, Goldbach and Nitsch (2017), for instance, use this information to also examine the effects of the strength, and changes in the strength (i.e., tightening and loosening), of sanctions on cross-border capital flows. In this paper, to save space, we generally limit our attention to the distinction whether a country is sanctioned or not.

3. Data

Our analysis is based on two confidential micro data sets from the Deutsche Bundesbank. Given the sensitivity of the business information involved, the data are only accessible, often in anonymized form, at the headquarters of the Bundesbank in Frankfurt, Germany.

We use the Deutsche Bundesbank's balance of payments statistics as our main source of data. This register contains detailed information on financial transactions between Germany and the rest of the world and has, for our purposes, at least two notable advantages. First, the data set is complete; all individuals, firms and financial institutions located in Germany are required to report cross-border payments in excess of 12,500 euros to the Deutsche Bundesbank, allowing the central bank to compile the monthly balance of payments statistics.⁹ Second, the register collects information on various transaction features, including the name and the address of the reporting unit, thereby allowing us to identify cross-border financial activities of non-financial declarants.¹⁰ In addition, for each single declaration, the value and the partner country of the transaction are provided as well as information on the type of asset that is transferred (bonds, commercial paper, stocks, investment certificate, equity capital, credit and other capital).¹¹ Hence, although the frequency of the data is monthly, with information provided at the end of the month, the data is effectively close to the level of the individual transaction.

In contrast to Besedeš, Goldbach and Nitsch (2017), however, we do not use the full sample of balance of payments entries available to us, but, aiming to assess the domestic (economic) costs of sanctions, focus our attention exclusively on transactions of non-financial declarants. Consequently, we exclude cross-border financial flows reported by financial institutions, many of them of considerable magnitude, which implies a loss of 4,364 declarants out of a total of 47,674 reporting units. We also deviate from Besedeš, Goldbach

⁹ See Section 67 of the Foreign Trade and Payments Ordinance (*Außenwirtschaftsverordnung*), available at <http://www.bmwi.de/Redaktion/DE/Downloads/A/awv-englisch.html>.

¹⁰ Cross-border transactions by households and individuals are typically declared by the financial institution that handles the transfer.

¹¹ For a few types of transactions, exemptions exist such that there is no declaration necessary; these exemptions are: payments below the threshold of 12,500 euro, payments related to the export and import of goods, (re-)payments related to short-term (duration of less than 12 months) loans, paid short-term deposits to foreign monetary institutions and payments which are forwarded to other foreigners.

and Nitsch (2017) in analyzing more years of data. Our sample covers the period from January 1999 to December 2014.

The second source of information that we use is the corporate balance sheets database of the Bundesbank, Ustan. The Bundesbank has collected, for various purposes, extensive data on individual firms. The data are often taken from financial statements, but may also have been obtained from a mandatory questionnaire that covers the firms' balance sheet and profit and loss accounts data. Most notably for our purposes, the database contains information on firm characteristics that are not included in the balance of payments data (such as firm employment or sales).¹²

The corporate balance sheets data are available on an annual basis. We merge the data with our information from the balance of payments data by the corresponding year (such that annual firm data is matched with the monthly transactions data in each of the twelve months in a given year). As the firm identifiers are not identical for the two data sets, we apply a propensity score string matching algorithm, based on the name of the firm, its address and its legal form, to link the two data sets. Schild, Schultz, and Wieser (2017) provide a detailed discussion of the matching methodology and the quality of the match; see also Appendix 1.

Information on financial sanctions is mainly obtained from the service center 'Financial Sanctions' of the Deutsche Bundesbank.¹³ This unit, which is responsible for the implementation of European Union Regulations on financial sanctions in Germany, provides a compilation of executive orders and disseminates relevant information to interested parties and the wider public. We augment this data with additional information from official European Union sources.¹⁴

During our sample period, financial sanctions have been newly imposed on 23 countries. Table 1 provides a list of countries along with a brief description of the measures taken.¹⁵ As shown, almost all target countries are economically small and/or poorly developed. More importantly, they are often of tiny importance for the international financial

¹² For a more detailed description, see https://www.bundesbank.de/Redaktion/EN/Standardartikel/Bundesbank/Research_Centre/research_data_micro_data_ustan.html.

¹³ See http://www.bundesbank.de/Navigation/EN/Service/Financial_sanctions/financial_sanctions.html.

¹⁴ Common Foreign and Security Policy Decisions and European Union Regulations are published in the Official Journal of the EU; see <http://eur-lex.europa.eu/homepage.html>.

¹⁵ The table has been updated and extended from Besedeš, Goldbach and Nitsch (2017).

business relationships of German non-financial companies. As shown in Figure 1, to the extent any (direct) financial activities are reported, the target countries typically account, with few exceptions, for less than 0.01 percent of cross-border capital flows by German non-financials.

Sanctions are applied instantaneously, such that there is no time lag between the date of announcement of a sanction and its enforcement. In our empirical analysis, with balance of payments data at monthly frequency, we code sanctions imposed after the middle of the month as being effective from the beginning of the following month. For two target countries, Uzbekistan and the Comoros, the sanctions have also been lifted again completely during our sample period. However, as German non-financial entities do not declare any financial business with the Comoros, these episodes of a (reverse) switch in sanction status are ignored.¹⁶

In Table 2, we describe our financial data in more detail. As noted above, the raw data are highly disaggregated, with separate statistical entries in a given month for each feature of a transaction. Therefore, in order to partly reduce the complexity of the data, the table reviews data at the country-month level, our main unit of analysis. Descriptive statistics are presented for both the full sample of available observations, and for transactions under sanction, along with a p-value for a t-test of equality of means.

Table 2 illustrates the various features and dimensions of our (raw) balance of payments data. For each country-month pair in our sample, there are, on average, about 33 separate entries of cross-border financial activities; each entry refers to a capital flow activity (inflow or outflow) in one of nine asset categories by a single German non-financial reporting unit (or declarant). Overall, there is broad trading activity which is particularly concentrated in credit, equity capital and direct investment credit.¹⁷

More interestingly, and perhaps not surprisingly, given the irrelevance of many sanction targets as a financial partner noted above, bilateral financial interactions with sanctioned countries are rare; sanction episodes account for only 4 percent of our sample (of country-month pairs). Also, capital flows under sanctions are, on average, of smaller,

¹⁶ Besedeš, Goldbach and Nitsch (2017) use these episodes to replicate their analysis for the removal (instead of the imposition) of sanctions, without new insights.

¹⁷ Once the sample is expanded to also include financial institutions and insurance companies, financial flows are dominated by trading activities in bonds and stocks; see Besedeš, Goldbach and Nitsch (2017).

although still sizable, magnitude.¹⁸ There are fewer balance of payments ‘transactions’, reported by a smaller number of declarants and involving fewer asset classes, potentially already reflecting greater administrative hurdles due to the imposition of financial sanctions.

4. Business with Sanctioned Countries

We begin our empirical analysis of the domestic costs of sanctions by examining the effect of sanctions on the targeted economic activity. Since financial sanctions typically put restrictions on cross-border financial interactions, we apply a differences-in-differences approach to analyze how financial flows declared by German non-financial entities to/from sanctioned countries have changed after the imposition of sanctions. More specifically, we estimate variants of the following model:

$$(1) \quad \text{Log}(\text{Flow}_{ct}) = \alpha + \beta \text{Sanctions}_{ct} \{ + \gamma X_{ct} \} + \eta_c + \phi_t + \varepsilon_{ct}$$

where Flow_{ct} is a measure of German financial activity with country c at time t , Sanctions_{ct} is an indicator variable that takes the value of one when financial sanctions are imposed (and is zero otherwise), X_{ct} is a vector of auxiliary control variables, and we include a full set of country-specific (η_c) and time-specific (ϕ_t) fixed effects. The coefficient of interest to us is β , which measures the effect of sanctions on cross-border financial activities; a negative and significant coefficient indicates that the adoption of sanctions is associated with fewer financial interactions between German non-financial declarants and their foreign counterparts, *ceteris paribus*. Throughout the analysis, we estimate regressions with OLS and apply cluster-robust Huber-White standard errors. Also, we analyze the data at the country-month level to reduce the amount of noise, and especially the number of zero observations (i.e., observations of no flows), in the raw data.¹⁹

¹⁸ As noted above, restrictive measures are typically tailored in order to promote the desired outcome; they do not prohibit automatically all business dealings with a sanctioned country. For the EU’s description of best practices for the effective implementation of restrictive measures, see http://eeas.europa.eu/archives/docs/cfsp/sanctions/docs/index_en.pdf.

¹⁹ As we examine a balanced sample, the analysis of more disaggregated data inflates the size of the panel dramatically.

We use four different variables to measure the intensity of bilateral financial interactions between Germany and countries (or, more precisely, territories) in the rest of the world: (1) the total value of bilateral capital flows (defined as the sum of inflows and outflows), (2) the value of gross capital inflows, (3) the value of gross capital outflows, and (4) the net value of bilateral capital flows (defined as outflows minus inflows). For us, none of the measures is obviously superior to any other, although we put perhaps somewhat less emphasis on the estimation results for net financial flows. We also experiment with adding further control variables to the baseline fixed effects differences-in-differences specification, at the costs of a (much) smaller sample size.

Table 3 reports the results. Columns (1) to (4) of the table present the estimates from the parsimonious specification of equation (1) which only includes, in addition to our variable of interest, the sanctions dummy, two sets of fixed effects. In this specification, all time-invariant influences on German financial flows with a country (such as, for instance, the partner's geographic distance from Germany) are accounted for by country fixed effects, while a comprehensive set of time fixed effects captures monthly variations in capital flows common to all partners. As shown, the point estimates of β are consistently negative and, with a value of about -0.8, of about the same magnitude as found in Besedeš, Goldbach and Nitsch (2017) who analyze a shorter but more comprehensive sample of German cross-border financial flows (covering, in addition, declarations by German financial institutions and insurance companies). Taken at face value, the point estimates of β imply that capital flows by German non-financial businesses with target countries of sanctions decrease, on average, by about 55 percent ($\approx \exp(-0.8) - 1$) after the imposition of financial sanctions which seems economically plausible. In comparison to Besedeš, Goldbach and Nitsch (2017), however, the statistical precision of the estimated effects is considerably lower. Only one of the four coefficients is estimated at the 5 percent level of statistical significance, while the remaining three coefficients are marginally significant at the 10 percent level. As a result, the activities of German non-financial entities seem to be less clearly affected by financial sanctions than the business activities of financial declarants.

This finding is confirmed when we additionally control for standard determinants of bilateral financial flows (such as the partner country's stock market capitalization).²⁰ Columns (5) to (8) of Table 3 tabulate the results from the augmented model of equation (1). In fact, with this extension, our estimates of β decrease in magnitude by about one-half and become

²⁰ See Forbes and Warnock (2012).

statistically indifferent from zero at any conventional level of confidence. Part of the decline in the estimated sanctions effect is explained by time-varying country-specific features. A country's overall financial openness, for instance, turns out to be, as expected, positively associated with German capital flows and is likely to decline under sanctions. The results are also affected, however, by the considerably reduced sample size. As some control variables are only available for a limited number of countries, our sample is effectively reduced to cover only seven (of 23) sanctions episodes. For these episodes, then, which contain the economically more relevant markets from the list of sanctioned countries, there is hardly any measurable effect of sanctions on the cross-border capital flows of German non-financial declarants identifiable. When we reestimate, for the restricted sample, the parsimonious specification of equation (1), the estimated β coefficient is of (borderline) statistical significance for only two measures of cross-border financial activity (total flows and net flows).^{21,22}

In Table 4, we expand our analysis to cover not only the value of financial flows but also other quantitative features of Germany's bilateral financial relationship with a country. In particular, we decompose aggregate financial flows with a partner into various (contributing) factors (such as the number of German reporting units that actually declare financial transactions with the country) and estimate the sanctions effect for these factors separately. The results of these decomposition exercises are reported in Table 4. As before, we experiment with various specifications of equation (1). However, to save space, we only report estimates for the coefficient of interest, β ; that is, each cell in the table contains the results of a separate regression. The regressand is tabulated in the first column on the left of the table; the remaining eight columns correspond to the specifications of equation (1) in Table 3 (including additional country controls for columns (5)-(8)). For comparison, the first row of Table 4 replicates the results for the value of financial flows shown in the first row of Table 3.

Reviewing the results, the sanctions effect varies sizably by type of margin. Specifically, for measures of the extensive margin of a bilateral financial relationship (such

²¹ Results are available on request.

²² Instead of controlling for determinants of cross-border financial flows, it may also be reasonable to restrict the analysis to a homogeneous group of countries. When we analyze a sample that only includes countries with a per capita income below that of the sanctioned country with the highest per capita income (Russia), our baseline results remain qualitatively unchanged.

as, for instance, the number of German reporting units that declare financial activities with a country in a given month), the estimated β coefficients take consistently negative and statistically significant values. In particular, our point estimates imply a decline in the number of declarants, depending on specification, by between 26 and 32 percent, while somewhat larger effects are observed for the number of statistical entries in the balance of payments. More notably, this finding is largely unaffected when we extend our specification to include additional control variables. As shown in columns (5) to (8), the coefficients even tend to increase in magnitude with this extension. In contrast to our findings for the intensive margin, these results indicate a measurable decline in financial activities with sanctioned countries after the imposition of sanctions.

A reasonable explanation for the discrepancy in our findings for the effects of sanctions along the intensive and the extensive margin is that ‘smart’ sanctions are, indeed, smart. To be more precise, financial restrictions may induce a reduction, or maybe even a complete elimination, of targeted economic activities, while hardly affecting Germany’s overall financial relationship with a sanctioned country. Consequently, they do not cause collateral damage.

Table 5 explores this hypothesis in more detail. In this table, we return to our analysis of the value of aggregate financial flows but now split the sanctions dummy by the size of the partner country’s market as proxied by the number of German entities declaring financial activities with a country; that is, instead of a single indicator variable for the application of financial sanctions, we now use two variables to identify sanctions episodes.²³ In particular, we hypothesize that financial restrictions have a larger effect on aggregate financial flows if they are imposed on countries in which only few German declarants report activities, while a withdrawal of some declarants may have basically no effect in markets with many German participants. As shown, the results indeed differ notably by market size. For small markets, for which the number of German declarants is below the median, the value of capital flows consistently declines after the imposition of sanctions, while the effect is statistically indifferent from zero for large markets. In sum, financial sanctions measurably restrict the

²³ For each sanctions episode, we count the number of German declarants that report financial activities with the target country in the twelve months before the imposition of the sanction and, then, split the sample in half to identify, according to this measure, large and small target countries. We also experiment, in unreported results, with other measures of market size, such as a country’s GDP, obtaining qualitatively similar findings. In line with our approach, Eaton, Kortum, and Kramarz (2011) document, for French firms, that the number of firms selling to a market increases with the size of the market.

financial activities of German non-financial declarants with the target country. However, except for target countries of (very) limited economic importance for German non-financials, there is no significant decline in overall business activity with the target country identifiable.

5. Firms Facing Sanctions

An implicit assumption in reduced-form assessments of the domestic costs of sanctions is that financial restrictions affect all internationally active firms in similar fashion. Firms reporting business with sanctioned countries, however, may be systematically different from other declarants, potentially affecting their ability to cope with restrictions. Therefore, we next describe German non-financial entities that report cross-border capital flows with a sanctioned country in more detail. To do so, we construct, from the balance of payments, measures of the extent of a firm's monthly cross-border financial activities and estimate regressions of the form:

$$(2) \quad \log(\text{FirmActivity})_{it} = \alpha + \beta \text{SanctionedFirm}_{it} \{ + \gamma Z_{it} \} + \phi_t + \varepsilon_{it}$$

where FirmActivity_{it} is a measure of declarant i 's aggregate cross-border financial activity at time t , $\text{SanctionedFirm}_{it}$ is an indicator variable that takes the value of one when declarant i faces sanctions on (part of) its business at time t (and is zero otherwise), Z is a vector of auxiliary control variables, and we include a full set of time-specific (ϕ_t) fixed effects. Our unit of observation for this exercise is a firm-month pair; that is, we compute, for each firm in our sample, a measure of the firm's business activities at a given point in time, and compare firms that declare activities with at least one country under sanctions with firms only reporting transactions with non-sanctioned countries, holding constant for other factors. To the extent there is any systematic difference between the firms identifiable, this difference will be captured by β , the estimated coefficient on our variable of interest.

As before, we proceed sequentially. We begin our analysis with a measure of how active a non-financial entity is in cross-border financial business as proxied by the log number of entries in the balance of payments statistics by a declarant in a given month (i.e., the firm-asset-country triplet). The results are reported in the first column in Table 6. The estimated

coefficient on the sanctions dummy is positive and statistically significant, indicating that non-financial declarants hit by sanctions tend to report a disproportionately large number of activities with countries worldwide. The point estimate of 1.3 indicates that firms affected by sanctions report, on average, 130 percent more cross-border financial transactions, measured by the number of country-asset pair entries in the balance of payments, than other declarants. Moreover, columns (2) to (4) show that this result remains qualitatively unchanged when we include additional control variables. In particular, we successively add (1) a comprehensive set of sector fixed effects to control for any industry-specific factors that may affect a firm's cross-border financial activity, (2) the total value of a firm's capital flows to control for firm size, and (3) the number of the firm's international markets that are under sanctions. While sector fixed effects and a firm's total cross-border flows explain part of the difference between entities operating under sanctions and other declarants, sanction-affected entities are still disproportionately more active in international markets, with the effect getting stronger the larger the number of sanctioned markets for which an entity reports business activities. Similarly, the results also hold for a balanced sample, which also includes (previously dropped) observations of zero cross-border activity, as shown in columns (5) to (8).²⁴

In Table 7, we experiment with other measures of firm activity, including firm characteristics taken from the corporate balance sheets database (such as employment and sales), without much effect on our main findings. Non-financial entities with activities in sanctioned countries are significantly larger than other declarants, by approximately 40 percent for both employment and sales. Firms which are active in sanctioned markets also have more total assets, and they are more productive.

In sum, we conclude that financial sanctions predominantly affect non-financial declarants with a wide range of domestic and international business activities and, therefore, considerable outside options. For a proper assessment of the domestic costs of sanctions, this empirical finding, which is unobservable from the analysis of aggregate data, may be of particular relevance.

6. Responses to Sanctions

In view of the outside business opportunities, we next examine how German non-financial declarants respond to the imposition of sanctions. To analyze this issue, we make

²⁴ Following standard practice, we add the value of 1 to our measure of firm activity, the number of firm-asset-partner triplets, to allow for log-linearization of this variable.

explicit use of our granular data that allow us to observe cross-border financial activities by individual declarant. In particular, we perform a two-step procedure. In a first step, we identify German reporting units which declared financial activities with sanctioned countries in the period of 12 months before restrictive measures were imposed. These declarants are classified as firms affected by sanctions.²⁵ Then, based on this information, we analyze differences in the activities between declarants affected (or ‘treated’) by sanctions and declarants without any business operations with target countries, examining firm activities with non-sanctioned countries only. We hypothesize that any systematic variation over time in the size and scope of financial activities with non-sanctioned countries between the two groups of declarants can be interpreted as evidence of business responses related to the imposition of sanctions. Specifically, we estimate equations of the form:

$$(3) \quad \text{Log}(\text{Flow}_{ct}^i) = \alpha + \beta \text{AffectedFirm}_{ct}^i \{ + \gamma X_{ct} \} + \eta_c^i + \phi_t + \varepsilon_{ct}$$

where Flow_{ct}^i is a measure of German financial activity of declarant i with country c at time t , $\text{AffectedFirm}_{ct}^i$ is an indicator variable that takes the value of one when a declarant reported business operations with a target country of sanctions in the 12 months before sanctions were imposed (and is zero otherwise), X is a vector of auxiliary control variables, and we include full sets of declarant-country-specific (η_c^i) and time-specific (ϕ_t) fixed effects. In our empirical setting in which we focus exclusively on a sample of non-sanctioned countries and, therefore, ignore the direct effects of sanctions, the estimate of β indicates the extent to which financial activities of treated reporting units with a given country deviate from the activities of other declarants after the treated units have been exposed to the treatment (i.e, they suffer from the imposition of sanctions on a third country).

Table 8 presents the results. The table is constructed analogously to our benchmark analysis of cross-border financial flows (Table 3); that is, we report estimates for our four measures of bilateral capital flows, using both a highly parsimonious specification of equation (3), with results being tabulated in columns (1)-(4) of the table, as well as a more demanding specification with additional control variables, for which the results are tabulated in columns

²⁵ A time window of 12 months before the imposition of sanctions allows us to ignore possible seasonal variation in financial activities. However, when we experiment with other time windows to identify sanctions-affected firms, we obtain very similar results.

(5)-(8). As before, the number of observations declines as the number of regressors increases because of missing country data. However, the drop in sample size turns out to be somewhat less pronounced for the analysis of firm-level data. Moreover, to the extent the control variables take significant coefficients, the results are reasonable and intuitive. Most notably, the effect of this modification on the main results is negligible, in contrast to our baseline findings above.

Turning to the variable of interest, the estimates of β are consistently positive and economically and statistically significant. Often, the t-statistic is close to ten. This finding suggests that German declarants affected by sanctions policies indeed turn out to be highly flexible in adjusting their business patterns, successfully exploring alternative business opportunities. According to our point estimates, treated declarants expand their activities with other (non-sanctioned) countries relative to German declarants unaffected by financial sanctions by 35 to 55 percent, depending on specification.

Another possible interpretation that is consistent with our empirical findings, however, is that declarants, instead of opening up new markets, simply continue business operations with target countries, via extended transactions with third countries. Consequently, sanctions would be largely ineffective because affected declarants circumvent the restrictions by using third countries as intermediaries.

Unfortunately, our data does not allow us to directly distinguish between these two different interpretations of the observed increase in third-country capital flows by sanctions-affected German declarants.²⁶ However, we are able to identify possible circumvention behavior. In particular, it is argued that circumvention of sanctions becomes more difficult the more countries impose them. As sanctions in our sample are imposed either by the European Union or by the entire United Nations, we expect to find evidence of circumvention, if anything, for sanctions imposed by the European Union alone. Further, it is assumed that countries which are economically close to the target countries of sanctions are the countries which may be more likely to serve as an intermediary.²⁷ Therefore, we identify a target

²⁶ The main restriction is our limited access to data, covering detailed balance of payments information from only a single source country, Germany.

²⁷ Besedeš, Goldbach and Nitsch (2017) also examine other potential intermediaries for the circumvention of financial sanctions, such as offshore financial centers. However, for this group of countries and territories, the results are much less conclusive.

country's five largest trading partners in the 12 months before the imposition of sanctions.²⁸ Specifically, we argue that a relative increase in the financial relationships of sanction-‘treated’ units with countries which are major trading partners of sanctioned countries can be interpreted as evidence of circumvention.²⁹

Estimation results are contained in Table 9. In contrast to our previous analysis, in which we use a single variable to describe the cross-border financial activities of German non-financial declarants affected by the imposition of sanctions relative to reporting units unaffected by sanctions, we now use six measures; these measures differentiate between the scope of sanctions (EU, UN) and the destination of third-country capital flows (top 5 trading partners of the target country, rest of the world), respectively. In combination, the results are indicative of circumvention behavior. Two findings are particularly noteworthy. First, for sanctions which have been imposed by the European Union alone, the estimated coefficients on the interaction terms (EU sanctions \times destination) consistently take positive and significant values. As a result, third-country capital flows of German declarants affected by EU sanctions have, on average, sizably increased in relative terms. More importantly, the coefficients are larger, in both a statistical and an economic sense, for financial transactions with countries with close economic ties with sanctioned countries. Depending on the flow and regression specification, the point estimates imply that business with the largest trading partners of sanctioned countries increased by about 80 to 120 percent whereas business with all other countries expanded by only about 30 to 60 percent. This notable difference in the geographic diversification of financial activities, holding constant for other factors, is suggestive of the possibility of circumvention behavior by sanctions-affected German declarants. Second, for UN sanctions, we obtain very different results. For these sanctions, which are (by definition) broader in geographic scope, transactions of affected firms increase, if anything, only for countries other than the major trading partners of target countries. As there is a priori no reason to expect a difference in patterns of geographic readjustment of financial activities by type of sanction, we argue, in line with Besedeš, Goldbach and Nitsch (2017), that this finding provides further evidence of efforts by affected declarants to circumvent financial sanctions.

²⁸ Monthly data on bilateral values of trade between countries are obtained from the International Monetary Fund's Direction of Trade Statistics. We compute a country's trade shares based on the sum of exports and imports.

²⁹ Circumvention does not necessarily imply that a sanctions regime is violated. Due to the administrative burden associated with sanctions, for instance, declarants also have a reasonable incentive to reroute legal activities.

In sum, we conclude that, in response to sanctions, affected firms expand their business with non-sanctioned countries. Especially for sanctions imposed by the EU alone, there is indirect evidence that firms manage to continue their business operations with the target countries via non-sanctioned countries which display close trade ties to the sanctioned country and, therefore, serve as intermediaries.

7. Sanctions and Firm Performance

In a final exercise, we examine the overall costs of sanctions on domestic businesses. In view of the frequent and widespread opposition of industry groups and business leaders to sanction policies, emphasizing the loss in foreign business opportunities associated with such policy measures, the restrictions are expected to (also) have measurable negative consequences for the domestic economy, at least at the firm level. Therefore, we ask: Do German non-financial declarants affected by sanctions experience an identifiable decline in firm performance?

We analyze this issue by estimating regressions of the form:

$$(4) \quad \log(\text{FirmPerformance})_{it} = \alpha + \beta \text{AffectedSanctionedFirm}_{it} + \nu_i + \phi_t + \varepsilon_{it}$$

where $\text{FirmPerformance}_{it}$ is a measure of declarant i 's overall economic performance at time t , $\text{AffectedSanctionedFirm}_{it}$ is an indicator variable that takes the value of one when declarant i reports business with a sanctioned country within 12 months before the imposition of sanctions or after the imposition of sanctions (and is zero otherwise), and we include a full set of firm-specific (ν_i) and time-specific (ϕ_t) fixed effects. In this differences-in-differences setting, to the extent that sanctions have any measurable effect on German non-financial entities, we expect the estimate of β to be negative and significant, indicating that firm performance worsens after the imposition of sanctions, holding constant for other (unobserved) firm features. As our data on firm characteristics are of annual frequency, we focus, in our baseline specification, on the contemporaneous association between sanctions and firm performance. Also, we jointly analyze the effects of sanctions on declarants that are affected by sanctions (because they reported business operations with a sanctioned country in

the 12 months before sanctions were imposed) and declarants that (continue to) operate under sanctions since a firm's activities may have been reduced or eliminated completely due to the imposition of restrictions.

Table 10 presents the results. As before, we experiment with a wide range of firm characteristics. Each column of the table reports the results of a separate regression, with the regressand tabulated in the first line. We begin, in column (1), with a model specification in which firm performance is proxied by the number of employees. In particular, we argue that the size of the workforce is probably the most comprehensive measure of a firm's economic adjustment costs to a sanctions environment. For firm employment as dependent variable, however, the point estimate of β , although negative, is economically small and statistically indistinguishable from zero. Taken at face value, this finding indicates that there is no measurable association between sanctions and firm performance. According to our estimation result, sanctions-affected firms do not change their labor force in response to sanctions. Still, adjustments in employment may be generally difficult, especially in the short term, due to German labor market regulations. Therefore, we next analyze a potentially more sensitive performance measure, a firm's total sales. As shown in column (2), for this regressand, the point estimate of β slightly increases in magnitude, but we obtain qualitatively similar estimation results. In line with our (weak) findings for the effects of sanctions on cross-border financial activities along the intensive margin, there is no evidence of a sizable drop in overall economic activity after the imposition of sanctions. Reassuringly, we note that this conclusion also holds for all our other measures of firm performance. The estimation results for assets, wages, capital intensity and productivity are tabulated in the remaining four columns of Table 10.

We perform extensive robustness checks to confirm that the results are insensitive to the exact regression specification.³⁰ For instance, we lag the regressor of interest one year to reduce possible simultaneity problems. We also estimate separate effects for firms affected by sanctions (and discontinuing business with the sanctioned country) and firms that still declare activities under sanctions. In none of these changes, however, the estimate of β takes a value that is statistically different from zero. As there is no observable difference in the business performance of German firms that either currently declare or previously have declared or never have declared transactions with a sanctioned country, we conclude that the domestic costs of financial sanctions at the firm level are negligible.

³⁰ In order to save space, we do not report the results.

8. Conclusions

Sanctions are meant to hurt! By restricting a country's access to international markets, they impose costs on the foreign government, with the ultimate aim of inducing a fundamental change in the government's policies. At the same time, however, a reduction in cross-border business also implies costs for the domestic economy. In fact, given the sanctioning country's demonstrated willingness to bear the economic burden associated with such measures, sanctions are widely considered to be a particularly powerful tool of diplomacy.

In this paper, we complement the sizable literature on the effects of sanctions on the target country by examining the economic costs of sanctions for the sanctioning country. In particular, we use detailed data from the German balance of payments statistics to analyze the effects of financial sanctions on German non-financial entities over the period from 1999 through 2014. During this time, Germany imposed, due to its international obligations as a member state of the United Nations and the European Union, restrictive financial measures on 23 countries.

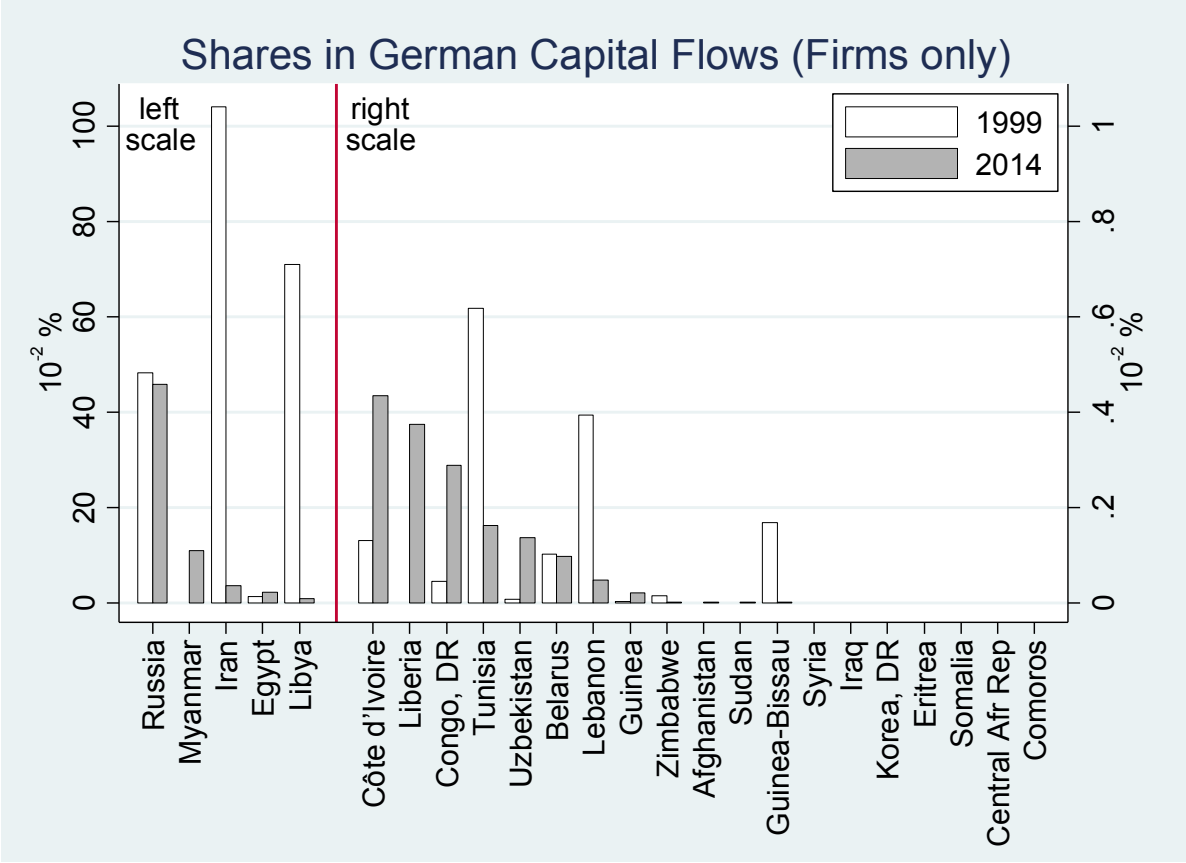
We find a measurable decline in Germany's financial activities with the sanctioned country after the imposition of sanctions. For non-financial entities, however, the reduction in cross-border business is mainly along the extensive margin, while the (negative) effect on financial flows, the intensive margin, is less precisely estimated, as one would expect for diplomatic attempts to 'target' sanctions on specific individuals, groups, entities and activities. More notably, our data set allows us to identify entities that declared business with the sanctioned country and, therefore, can be assumed to be directly affected by the restrictive measures. These entities are not only found to be more active in international markets, providing them with numerous outside options to deal with the decline in business with the sanctioned country, there is also consistent evidence that they make use of such options, significantly expanding their business operations with non-sanctioned countries. As a result, it is unsurprising that we find no sanctions effect on aggregate indicators of firm-level activity, such as employment or sales. Overall, we conclude that sanctions have, at most, limited economic consequences for the sanctioning country.

References:

Bernard, Andrew B., J. Bradford Jensen, Stephen J. Redding and Peter K. Schott. 2017. "Global Firms," Journal of Economic Literature. (forthcoming).

- Besedeš, Tibor, Stefan Goldbach, and Volker Nitsch. 2017. "You're Banned! The Effect of Sanctions on German Cross-Border Financial Flows," Economic Policy. 32 (April): 263-318.
- Biersteker, Thomas, Sue E. Eckert, Marcos Tourinho, and Zuzana Hudáková. 2013. The Effectiveness of United Nations Targeted Sanctions. Geneva: Targeted Sanctions Consortium.
- Buch, Claudia M. and Alexander Lipponer. 2004. "FDI Versus Cross-Border Financial Services: The Globalisation of German Banks," Deutsche Bundesbank Discussion Paper 05/2004.
- Eaton, Jonathan, Samuel Kortum, and Francis Kramarz. 2011. "An Anatomy of International Trade: Evidence from French Firms," Econometrica. 79 (September): 1453-1498.
- Forbes, Kristin and Francis Warnock. 2012. "Capital Flow Waves: Surges, Stops, Flight, and Re-trenchment," Journal of International Economics. 88 (November): 235-251.
- Hufbauer, Gary Clyde, Kimberly Ann Elliott, Tess Cyrus, and Elizabeth Winston. 1997. "US Economic Sanctions: Their Impact on Trade, Jobs, and Wages," Institute for International Economics Working Paper.
- Hufbauer, Gary Clyde, Jeffrey J. Schott, Kimberly Ann Elliott, and Barbara Oegg. 2007. Economic Sanctions Reconsidered, 3rd Edition. Washington, DC: Institute for International Economics.
- Kaempfer, William H. and Anton D. Lowenberg. 2007. "The Political Economy of Economic Sanctions," in Todd Sandler and Keith Hartley (eds.) Handbook of Defense Economics, Volume 2. Amsterdam: Elsevier.
- Levy, Philip. 1999. "Sanctions on South Africa: What Did They Do?," American Economic Review. 89 (May): 415-420.
- Masters, Jonathan. 2015. "What Are Economic Sanctions?," Council for Foreign Relations, available at <http://www.cfr.org/sanctions/economic-sanctions/p36259>
- Schild, Christopher-Johannes, Simone Schultz, and Franco Wieser. 2017. "Linking Deutsche Bundesbank Company Data Using Machine-Learning-Based Classification," Technical Report 2017-01, Deutsche Bundesbank Research Data and Service Center.

Figure 1: The Relevance of Sanctioned Countries for Cross-Border Capital Flows of German Non-Financial Declarants



Source: Authors' calculations.

Table 1: List of Financial Sanctions, 1999-2014

Country	First announcement (Lifted)	Measures taken
Myanmar	22 May 2000	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment
Somalia	27 January 2003	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment
Liberia	4 September 2003	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment
Congo, Dem. Rep.	29 September 2003	Freezing of assets and economic resources of natural persons and establishments
Sudan	26 January 2004	Freezing of assets and economic resources of natural persons
Zimbabwe	19 February 2004	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment
Côte d'Ivoire	31 January 2005	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment
Uzbekistan	14 November 2005 (15 December 2009)	Export restriction on goods related to nuclear technology
Lebanon	21 February 2006	Freezing of assets and economic resources
Belarus	18 May 2006	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment
Iran	2 February 2007	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment, chemicals and other resources (gold, silver, ...)
Korea, Dem. Rep.	27 March 2007	Freezing of assets and economic resources of natural persons and establishments; export restriction on luxury goods and goods related to nuclear technology
Comoros	17 March 2008 (24 July 2008)	Freezing of assets and economic resources of natural persons
Guinea	22 December 2009	Freezing of assets and economic resources of natural persons; export restriction on military equipment
Eritrea	26 July 2010	Freezing of assets and economic resources; export restriction on military equipment
Tunisia	4 February 2011	Freezing of assets and economic resources of natural persons
Libya	2 March 2011	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment
Egypt	21 March 2011	Freezing of assets and economic resources of natural persons
Syria	9 May 2011	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment, chemicals and other resources (gold, silver, ...)
Afghanistan	1 August 2011	Freezing of assets and economic resources

		of natural persons and establishments
Guinea-Bissau	3 May 2012	Freezing of assets and economic resources of natural persons
Russia	5 March 2014	Freezing of assets and economic resources of natural persons and establishments; export restriction on oil drilling machinery, chemicals and other natural resources
Central African Republic	10 March 2014	Freezing of assets and economic resources of natural persons and establishments

Source: Deutsche Bundesbank, Service center 'Financial Sanctions'.

Table 2: Descriptive Statistics

	Full Sample			Under Sanctions			t-test (p-value)
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	
Total Flows (Bn. €)	22,381	0.81	4.40	893	0.02	0.88	0.00
Entries (Number)	22,381	32.53	75.30	893	3.74	9.21	0.00
Avg. Flow per Entry (Mn. €)	22,381	8.41	47.58	893	7.13	71.93	0.41
Declarants (Number)	22,381	26.25	56.31	893	3.63	8.80	0.00
Avg. Number of Entries per Declarant	22,381	1.09	0.16	893	1.02	0.10	0.00
Asset Classes (Number)	22,381	3.51	2.38	893	1.88	1.10	0.00
Avg. Flow per Asset Class per Declarant (Mn. €)	22,381	3.37	39.38	893	6.58	71.90	0.01
Inflows (Bn. €)							
– By German Investors	21,408	0.15	0.82	853	0.01	0.01	0.00
– By Foreign Investors	11,625	0.59	3.19	221	0.01	0.01	0.01
Outflows (Bn. €)							
– By German Investors	21,408	0.18	0.91	853	0.01	0.01	0.00
– By Foreign Investors	11,625	0.37	2.25	221	0.01	0.01	0.01
Assets (Bn. €)							
– Bonds	10,708	0.30	1.39	152	0.01	0.01	0.01
– Commercial Paper	2,827	0.11	3.15	0	0.00	0.00	
– Stocks	9,414	0.29	1.64	203	0.01	0.01	0.01
– Investment Certificate	5,071	0.17	0.84	41	0.00	0.00	0.19
– Equity Capital	13,958	0.29	2.73	333	0.01	0.04	0.06
– Direct Investment Credit	12,974	0.15	0.87	315	0.01	0.03	0.01
– Credit	16,365	0.14	0.56	586	0.01	0.09	0.00
– Other Capital	6,959	0.01	0.05	48	0.01	0.02	0.85
– Coupon	291	0.02	0.09	0	0.00	0.00	

Notes: The unit of observation is a country-month pair. If not noted otherwise, values refer to the sum of inflows and outflows.

Table 3: The Effect of Sanctions on Cross-Border Capital Flows

	Log Total Flows	Log Inflows	Log Outflows	Log Net Flows 	Log Total Flows	Log Inflows	Log Outflows	Log Net Flows
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sanctions	-0.827* (0.436)	-0.962** (0.475)	-0.781* (0.423)	-0.689* (0.352)	-0.420 (0.306)	-0.330 (0.800)	-0.492 (0.636)	-0.461* (0.265)
Stock Market Capitalization					0.001 (0.001)	0.002 (0.001)	0.001 (0.001)	0.001 (0.001)
Capital Account Openness					0.771** (0.355)	-0.059 (0.702)	0.776** (0.357)	0.948** (0.390)
Public Debt					-0.003 (0.004)	-0.006 (0.004)	-0.005 (0.004)	0.001 (0.004)
Real GDP Growth					0.208 (0.169)	-0.278 (0.315)	0.562*** (0.215)	0.176 (0.139)
Log GDP per Capita					0.024 (0.071)	0.152 (0.149)	0.004 (0.075)	0.049 (0.081)
Observations	40,512	40,512	40,512	40,512	13,148	13,148	13,148	13,148
Adj. R²	0.808	0.788	0.806	0.764	0.815	0.732	0.745	0.663

Notes: OLS estimation. The dependent variable is the log of the total value for the capital flow specified at the top of each column. The unit of observation is a country-month pair. Data cover the period from January 1999 through December 2014 in monthly frequency. Time fixed effects and country-specific fixed effects are included but not reported. Robust standard errors (clustered by country) in parentheses. ***, ** and * denote significant at the 1%, 5% and 10% level, respectively.

Table 4: The Effect of Sanctions on Cross-Border Financial Transactions

	Without Additional Control Variables				With Additional Control Variables			
	Log Total Flows	Log Inflows	Log Outflows	Log Net Flows	Log Total Flows	Log Inflows	Log Outflows	Log Net Flows
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log Total Value	-0.827* (0.436)	-0.962** (0.475)	-0.781* (0.423)	-0.689* (0.352)	-0.420 (0.306)	-0.330 (0.800)	-0.492 (0.636)	-0.461* (0.265)
Log Number of Entries	-0.322*** (0.101)	-0.325*** (0.076)	-0.317*** (0.085)	-0.322*** (0.101)	-0.437** (0.179)	-0.351* (0.191)	-0.528** (0.208)	-0.437** (0.179)
Log Average Value per Entry	-0.505 (0.358)	-0.628 (0.401)	-0.460 (0.343)	-0.368 (0.279)	0.016 (0.196)	0.070 (0.685)	-0.048 (0.603)	-0.026 (0.197)
Log Number of Declarants	-0.300*** (0.099)	-0.308*** (0.075)	-0.308*** (0.075)	-0.300*** (0.099)	-0.391** (0.174)	-0.312* (0.185)	-0.312* (0.185)	-0.391** (0.174)
Log Number of Asset Classes	-0.135** (0.057)	-0.139*** (0.042)	-0.125** (0.049)	-0.135** (0.058)	-0.240** (0.098)	-0.148 (0.125)	-0.251** (0.123)	-0.240** (0.098)
Log Avg. Value per Asset Class per Declarant	-0.392 (0.329)	-0.515 (0.409)	-0.357 (0.331)	-0.254 (0.252)	0.211 (0.204)	0.131 (0.628)	0.249 (0.575)	0.169 (0.229)

Notes: OLS estimation. Each cell contains the coefficient from a separate regression; the regression specification is similar to the corresponding column in Table 3. The dependent variable is listed in the first column; the sample is specified at the top of each column. The unit of observation is a country-month pair. Data cover the period from January 1999 through December 2014 in monthly frequency. Robust standard errors (clustered by country) in parentheses. ***, ** and * denote significant at the 1%, 5% and 10% level, respectively.

Table 5: The Effect of Sanctions Cross-Border Capital Flows by Size of Destination Market

	Without Additional Control Variables				With Additional Control Variables			
	Log Total Flows	Log Inflows	Log Outflows	Log Net Flows	Log Total Flows	Log Inflows	Log Outflows	Log Net Flows
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sanctions Against Large Countries	-0.745 (0.786)	-0.677 (0.832)	-0.828 (0.786)	-0.580 (0.611)	-0.392 (0.367)	0.525** (0.222)	-0.929* (0.551)	-0.470 (0.313)
Sanctions Against Small Countries	-0.919*** (0.266)	-1.280*** (0.343)	-0.727*** (0.184)	-0.811*** (0.268)	-0.555*** (0.188)	-4.376*** (0.237)	1.579*** (0.207)	-0.417** (0.197)
Observations	40,512	40,512	40,512	40,512	13,148	13,148	13,148	13,148
Adj. R²	0.808	0.788	0.806	0.764	0.815	0.734	0.745	0.663

Notes: OLS estimation. The regression specification is similar to the corresponding column in Table 3. The dependent variable is specified at the top of each column. The unit of observation is a country-month pair. Data cover the period from January 1999 through December 2014 in monthly frequency. Robust standard errors (clustered by country) recorded in parentheses. ***, ** and * denote significant at the 1%, 5% and 10% level, respectively.

Table 6: A Characterization of Firms with Capital Flows under Sanctions

	Recorded Capital Flows Only				Capital Flows Including Zeros			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dummy Firm with Capital Flows under Sanctions	1.267*** (0.187)	1.185*** (0.164)	1.037*** (0.134)	0.215*** (0.082)	0.379*** (0.063)	0.372*** (0.062)	0.190*** (0.037)	0.121*** (0.029)
Log Total Value of Firm Capital Flows			0.110*** (0.005)	0.106*** (0.004)			0.127*** (0.001)	0.127*** (0.001)
Log Number of Capital Flows under Sanctions by Firm				1.020*** (0.080)				0.097*** (0.013)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Fixed Effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Observations	326,957	326,957	326,957	326,957	8,312,832	8,312,832	8,312,832	8,312,832
Firms	43,296	43,296	43,296	43,296	43,296	43,296	43,296	43,296
Adj. R²	0.032	0.080	0.265	0.305	0.009	0.017	0.794	0.795

Notes: OLS estimation. The dependent variable is the log number of firm capital flow transactions (firm-asset-partner triplet) in the German Balance of Payments statistics. The unit of observation is a firm-month pair. Data cover the period from January 1999 through December 2014 in monthly frequency (192 months). Robust standard errors (clustered by firm) recorded in parentheses. ***, ** and * denote significant at the 1%, 5% and 10% level, respectively.

Table 7: A Further Characterization of Firms with Capital Flows under Sanctions

	Log Average Value per Transaction	Log Number Countries	Log Number Asset Classes	Log Firm Employment	Log Firm Sales	Log Firm Total Assets	Log Firm Productivity
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dummy Firm with Capital Flows under Sanctions	-1.037*** (0.134)	0.956*** (0.118)	0.238*** (0.044)	0.409*** (0.154)	0.412** (0.162)	0.447*** (0.128)	0.175* (0.099)
Log Total Value of Firm Capital Flows	0.890*** (0.005)	0.090*** (0.004)	0.035*** (0.002)	0.220*** (0.009)	0.268*** (0.011)	0.361*** (0.010)	0.070*** (0.005)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector Fixed Effects	Yes	Yes	Yes	No	No	No	No
Industry Fixed Effects	No	No	No	Yes	Yes	Yes	Yes
Observations	326,957	326,957	326,957	16,491	16,070	17,929	14,217
Firms	43,296	43,296	43,296	4,819	4,820	5,216	4,386
Frequency	Monthly	Monthly	Monthly	Yearly	Yearly	Yearly	Yearly
Adj. R²	0.947	0.236	0.150	0.561	0.562	0.539	0.312

Notes: OLS estimation. The dependent variable is listed in the first line; the regression specification is similar to column 4 in Table 4. Data cover the period from January 1999 through December 2014 in monthly frequency. Robust standard errors (clustered by firm) recorded in parentheses. ***, ** and * denote significant at the 1%, 5% and 10% level, respectively.

Table 8: The Effects of Sanctions on Third-Country Capital Flows

	Log Total Flows	Log Inflows	Log Outflows	Log Net Flows 	Log Total Flows	Log Inflows	Log Outflows	Log Net Flows
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Affected Declarant	0.437*** (0.045)	0.456*** (0.052)	0.323*** (0.049)	0.307*** (0.038)	0.415*** (0.051)	0.412*** (0.058)	0.316*** (0.053)	0.287*** (0.043)
Stock Market Capitalization					0.001*** (0.000)	0.002*** (0.000)	0.001** (0.000)	0.001*** (0.000)
Capital Account Openness					0.304* (0.173)	0.242 (0.333)	0.428** (0.193)	0.319** (0.151)
Public Debt					-0.001 (0.001)	0.002 (0.002)	-0.001 (0.001)	-0.001 (0.001)
Real GDP Growth					0.019 (0.059)	-0.059 (0.090)	0.061 (0.068)	0.041 (0.056)
Log GDP per Capita					-0.059 (0.037)	-0.079 (0.061)	-0.063 (0.044)	-0.054 (0.033)
Observations	571,799	295,600	416,075	565,942	454,816	231,200	335,465	450,410
Adj. R²	0.681	0.710	0.683	0.619	0.683	0.710	0.681	0.620

Notes: OLS estimation. The dependent variable is specified at the top of each column. The unit of observation is a firm-country-month triplet. Data cover the period from January 1999 through December 2014 in monthly frequency. Time fixed effects and firm-country-specific fixed effects are included but not reported. Robust standard errors (clustered by country) recorded in parentheses. ***, ** and * denote significant at the 1%, 5% and 10% level, respectively.

Table 9: The Effects of Sanctions on Third-Country Capital Flows Extended

	Log Total Flows	Log Inflows	Log Outflows	Log Net Flows 	Log Total Flows	Log Inflows	Log Outflows	Log Net Flows
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EU	-0.085 (0.119)	-0.125 (0.151)	-0.030 (0.137)	0.047 (0.117)	-0.074 (0.120)	-0.001 (0.152)	-0.021 (0.141)	0.047 (0.120)
UN	-0.419 (0.714)	-0.546* (0.284)	0.111 (1.064)	0.016 (0.576)	0.304 (0.704)	0.138 (0.387)	0.785 (0.999)	0.487 (0.642)
Affected Declarant EU Top5	0.783*** (0.203)	0.769*** (0.189)	0.642*** (0.201)	0.593*** (0.170)	0.777*** (0.206)	0.761*** (0.188)	0.666*** (0.202)	0.587*** (0.173)
Affected Declarant EU Rest	0.425*** (0.054)	0.454*** (0.059)	0.345*** (0.059)	0.259*** (0.045)	0.415*** (0.060)	0.422*** (0.066)	0.344*** (0.064)	0.252*** (0.051)
Affected Declarant UN Top5	0.457 (0.347)	0.292 (0.417)	0.348 (0.351)	0.552** (0.258)	0.411 (0.340)	0.215 (0.400)	0.312 (0.339)	0.508** (0.254)
Affected Declarant UN Rest	0.242*** (0.089)	0.296** (0.116)	0.048 (0.098)	0.195** (0.077)	0.138 (0.095)	0.167 (0.123)	-0.005 (0.101)	0.083 (0.081)
Stock Market Capitalization					0.001*** (0.000)	0.002*** (0.000)	0.001** (0.000)	0.001*** (0.000)
Capital Account Openness					0.357** (0.157)	0.246 (0.279)	0.438** (0.175)	0.393*** (0.140)
Public Debt					-0.001 (0.001)	0.002 (0.002)	-0.002 (0.001)	-0.001 (0.001)
Real GDP Growth					0.015 (0.058)	-0.052 (0.087)	0.048 (0.067)	0.044 (0.055)
Log GDP per Capita					-0.036 (0.038)	-0.072 (0.059)	-0.038 (0.045)	-0.033 (0.035)
Observations	587,557	302,394	427,625	581,556	467,657	236,550	344,881	463,160
Adj. R²	0.681	0.710	0.683	0.618	0.681	0.709	0.680	0.619

Notes: OLS estimation. The dependent variable is specified at the top of each column. The unit of observation is a firm-country-month triplet. Data cover the period from January 1999 through December 2014 in monthly frequency. Time fixed effects and firm-country-specific fixed effects are included but not reported. Robust standard errors (clustered by country) recorded in parentheses. ***, ** and * denote significant at the 1%, 5% and 10% level, respectively.

Table 10: The Effects of Sanctions on Firm Performance

	Log Firm Employment	Log Firm Sales	Log Firm Total Assets	Log Firm Wages	Log Firm Capital Intensity	Log Firm Productivity
	(1)	(2)	(3)	(4)	(5)	(6)
Affected Declarant	-0.015 (0.066)	-0.063 (0.087)	0.058 (0.061)	0.026 (0.035)	-0.047 (0.119)	0.120 (0.079)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,492	16,069	17,929	16,305	16,045	14,217
Firms	4,820	4,820	5,216	4,766	4,676	4,386
Frequency	Yearly	Yearly	Yearly	Yearly	Yearly	Yearly
Adj. R²	0.961	0.946	0.975	0.797	0.899	0.839

Notes: OLS estimation. The dependent variable is listed in the first line. Data cover the period from January 1999 through December 2014 in annual frequency. Robust standard errors (clustered by firm) recorded in parentheses. ***, ** and * denote significant at the 1%, 5% and 10% level, respectively.

Appendix 1: Matching Procedure

Most of our estimates are based on data from a single source, the Deutsche Bundesbank's Balance of Payments (BoP) statistics. However, for some analyses, we also link the information from the BoP statistics to firm-level information taken from the Deutsche Bundesbank's corporate balance sheets database (Ustan).

Collected for different purposes and by different departments within Deutsche Bundesbank, the data lack a unique firm identifier. Therefore, following common internal practice, we apply a string matching procedure, where the algorithm takes into account the name of a unit, its address and its legal form, to identify the same real-world entity in the two data sets. Schild, Schultz, and Wieser (2017) provide an extensive documentation of this procedure and a detailed evaluation of the match result.

Table A1 presents a brief overview of the various data samples. As shown, 12.1 percent of the non-financial reporting units in the BoP are matched to data in Ustan, covering about 12.7 percent of the BoP entries. More notably, the matched data set does not differ significantly from the BoP data. While matched units are expected to be relatively large, their cross-border financial flows only marginally exceed the averages in the BoP sample.

Table A1: Descriptive Statistics on the Matched Sample, 1999-2014

	BoP	Ustan	BoP-Ustan
	(1)	(2)	(3)
Frequency	Monthly	Yearly	Monthly
Observations (Number)	734,441	454,362	93,267
Firms (Number)	43,310	71,816	5,237
Mean Total Flows (1,000 €)	25,029		26,621
Mean Inflows (1,000 €)	13,915		14,211
Mean Outflows (1,000 €)	11,114		12,410
Mean Net Flows (1,000 €)	2,801		1,800
Share of Sanctioned Observations (%)	0.5		0.6

Notes: All data have been obtained from the Deutsche Bundesbank. BoP is the balance of payments; Ustan is the corporate balance sheet statistics.