

# Discussion Paper

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## **You're banned! The effect of sanctions on German cross-border financial flows**

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## **Non-technical summary**

### Research Question

This paper examines the effect of financial sanctions on cross-border capital flows. While sanctions can be expected to hinder international transactions, thereby putting political and economic pressure on a target country, we study the patterns of adjustment in bilateral relationships after the imposition of a sanction along various dimensions. For instance, in addition to aggregate effects, we explore variations in capital flows after a strengthening and an easing of restrictive measures.

### Contribution

To analyze these issues, we use data from the German balance of payments statistics. Our data set contains detailed information on individual balance of payments transactions that allows us to explore differences in the effects of sanctions along various dimensions including possible diversion effects to non-sanctioned countries. A typical data entry provides the name of the German reporter of the transaction (typically an individual, a firm or a financial institution), the date and type of transaction, the partner country, the asset class and the transaction value. Our sample spans the period from 2005 through 2014. During this time, the European Union has imposed financial sanctions on 20 countries. Almost all of these sanctions, with the exception of two episodes, are still in place. A differences-in-differences approach then allows us to identify the effects of sanctions on capital flows.

### Results

We find two key results. First, financial sanctions have a strong and immediate negative effect on cross-border financial flows in either direction. Second, we find evidence of possible circumvention of sanctions imposed by the EU which are only enforced by member countries.

## **Nichttechnische Zusammenfassung**

### Fragestellung

Im vorliegenden Forschungspapier wird untersucht, wie sich Finanzsanktionen auf grenzüberschreitende Kapitalströme auswirken. Sanktionen können internationale Transaktionen durchaus behindern und dadurch politischen und wirtschaftlichen Druck auf das Land ausüben, gegen das sie verhängt wurden. Wir analysieren die Anpassung bilateraler Beziehungen nach der Auferlegung einer Sanktion anhand verschiedener Dimensionen. Letztlich untersuchen wir neben den Gesamtauswirkungen auch, wie die Kapitalströme nach einer Verschärfung oder einer Lockerung von Restriktionen variieren.

### Forschungsbeitrag

Unsere Analyse stützt sich auf Daten aus der deutschen Zahlungsbilanzstatistik. Diese liefern detaillierte Informationen zu einzelnen Zahlungsbilanztransaktionen, aus denen wir die Auswirkungen von Sanktionen in ihren verschiedenen Dimensionen, einschließlich der Effekte möglicher Umlenkungen auf nicht von den Sanktionen betroffene Staaten, ermitteln können. Ein Dateneintrag beinhaltet den Namen des deutschen Melders einer Transaktion (i. d. R. einer Einzelperson, eines Unternehmens oder eines Finanzinstituts), Datum und Art der Transaktion, Partnerland, Vermögensklasse und Transaktionswert. Die von uns verwendeten Daten erstrecken sich auf die Jahre 2005 bis 2014. In diesem Zeitraum belegte die Europäische Union 20 Länder mit Finanzsanktionen, die mit Ausnahme zweier Episoden nahezu alle noch in Kraft sind. Mittels eines „Differences-in-differences“-Ansatzes lassen sich die Effekte von Sanktionen auf den Kapitalverkehr identifizieren.

### Ergebnisse

Wir erhalten zwei Hauptergebnisse. Erstens haben finanzielle Sanktionen eine starke und unmittelbare negative Auswirkung auf die grenzüberschreitenden Kapitalströme, unabhängig von der betrachteten Richtung. Zweitens finden wir Hinweise auf mögliche Umgehung von Sanktionen, die nur von den Mitgliedsstaaten der EU verhängt werden.

# **You're Banned!**

## **The Effect of Sanctions on German Cross-Border Financial Flows\***

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### Abstract

This paper examines the effect of financial sanctions on cross-border capital flows. While sanctions can be expected to hinder international transactions, thereby putting political and economic pressure on a target country, we study the patterns of adjustment in bilateral financial relationships after the imposition of sanctions along various dimensions. Our analysis is based on highly disaggregated, monthly data from the German balance of payments statistics for the period from 2005 through 2014. During this time, Germany imposed financial sanctions on 20 countries; two of these sanctions have been lifted. Applying a differences-in-differences approach, we find two key results. First, financial sanctions have a strong and immediate negative effect on cross-border financial flows, with flows reduced in either direction. Second, sanctions imposed by the European Union alone, and therefore only enforced by their member countries instead of the United Nations, are possibly partly evaded.

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# 1. Introduction

Sanctions are widely considered to be a powerful instrument of international diplomacy. Sanctions imply an action. Since direct (practical) measures are taken, they go beyond threats, negotiations and agreements in achieving a foreign policy goal. Sanctions are also costly. Imposing restrictions on external interactions puts political and economic pressure on the sanctioned (or target) country; likewise, limits and regulations of business activities may also adversely affect the sanctioning (or sender) country. Overall, sanctions convey a strong signal of the imposing country's interest in a particular policy outcome.

The effectiveness of sanctions, however, is still a matter of dispute. Reviewing a broad sample of historical case studies, Hufbauer, Schott, Elliott, and Oegg (2007, p. 7) conclude that “[s]anctions often do not succeed in changing the behavior of foreign countries.” Reasons for the failure of sanction policies are manifold, including elusive goals, inappropriate means and incomplete implementation. In contrast, sanctions are in frequent and ongoing use in practice. If anything, the number of sanction episodes seems to have increased in recent years. Most prominently, the European Union imposed sanctions on Russia in March 2014, responding to the conflict between the Ukraine and Russia.

In this paper, we examine empirically the effect of financial sanctions imposed by Germany on cross-border capital flows. In particular, we are interested in two questions: do sanctions affect bilateral flows between the sanctioning country and the sanctioned country, and are sanctions being circumvented? Sanctions, embargos, asset freezes and other forms of legally-imposed restrictions can be, in principle, expected to reduce cross-border transactions of the sanctioning country with the sanctioned country by reducing the extent to which sanctioning country's firms are able to conduct business as usual. However, since many of these restrictive measures have become increasingly targeted at specific sectors or listed individuals, mainly to limit the humanitarian consequences of such actions, the overall effect of sanctions on bilateral capital flows may be negligible. Moreover, even a sizable decline in bilateral capital flows does not necessarily mean that imposed sanctions work since capital flows may have been redirected through other destinations. We aim to understand the channels and mechanisms of how sanctions work.

To analyze these issues, we use data from German balance of payments statistics. Our data set contains detailed information on individual balance of payments transactions that allows us to explore differences in the effects of sanctions along various dimensions including

possible diversion effects to non-sanctioned countries. A typical data entry provides the name of the German reporter of the transaction (typically an individual, a firm or a financial institution), the date and type of transaction, the partner country, the asset class and the transaction value. Our sample spans the period from 2005 through 2014. During this time, Germany has imposed financial sanctions on 20 countries. Almost all of these sanctions, with the exception of two episodes, are still in place. A differences-in-differences approach then allows us to identify the effects of sanctions on capital flows.

The first question we seek to answer is whether the imposition of sanctions has an effect on bilateral financial flows between the sanctioning country and the sanctioned country, between the sender of sanctions and the target of sanctions. Sanctions may not only limit directly a sender country's capital outflows (e.g., by prohibiting the granting of a financial loan or credit), but capital outflows could also decline in formally unrestricted business areas due to an increase in market uncertainty abroad (possibly related to fears that the target country may take retaliatory action on the sender country) or a greater administrative effort. Another potential mechanism for the effect of sanction policies on capital flows is a decline in capital inflows to the sender country due to a freezing of the target country's operating accounts.

We find that financial activities between Germany and the targeted country decline significantly after the imposition of financial sanctions. Responding to the restrictive capital measures, German investors tend to sell their assets held in sanctioned countries. Similarly, investors from targeted countries engage less in the German financial market. Consequently, our results indicate that sanctions do have immediate effects, irrespective of whether they achieve their ultimate goal, forcing the target country to change its behavior, a question that is outside the scope of this paper.

The second question we seek to answer is whether German firms can avoid much of the effect of sanctions. In identifying the extent of possible evasion behavior, we examine the business activities of firms affected by sanctions, i.e., firms which used to engage with targeted countries before the imposition of sanctions, and take advantage of the fact that Germany typically imposes sanctions authorized by either the European Union or the United Nations. Specifically, we argue that sanctions authorized by the UN Security Council should presumably be enforced by most, if not all, countries in the world. EU imposed sanctions, on the other hand, are only enforced by member countries and could potentially be circumvented

by conducting transactions not directly with sanctioned countries but through third countries who act as an intermediary.

Previewing our results, we find that firms which used to do business with sanctioned countries indeed increased their transactions with third countries. However, they do so only when sanctions are imposed by the European Union alone. When sanctions are imposed by the United Nations, we find no evidence of increased activity with third countries. The latter finding is important as it reduces the likelihood that the identified increase in third-country transactions in the case of EU sanctions is a consequence of affected firms diversifying their portfolio. In such a case, we should observe similar increases irrespective of which political body imposed sanctions. The likely explanation then of increased third-country transactions in the case of EU-imposed sanctions is evasion and circumvention.

An obvious limitation of our analysis is the exclusive focus on cross-border financial flows to and from one country, Germany. However, as noted above, sanction measures are rarely taken in isolation by a single country alone; they are often adopted by a group of countries. In fact, all sanctions in our sample have been imposed by either the European Union or the United Nations. As a result, our findings may also be indicative for the response of capital flows of other sender countries.

The remainder of the paper is structured as follows. In Section 2, we review the relevant literature. Section 3 briefly describes the operations of financial sanctions, followed by a detailed description of the data source in Section 4. Section 5 motivates our empirical methodology and presents the baseline results. Section 6 explores evidence on the redirection of capital flows, possibly in an effort to evade the effects of sanctions, while examines variations in the intensity of sanctions since restrictive measures take, in practice, various forms. Finally, Section 8 briefly concludes.

## **2. Literature**

An already sizable literature, both in economics and political science, analyzes a broad range of issues related to economic sanctions. Hufbauer, Schott, Elliott, and Oegg (2007) compile, in a landmark study, an extensive and repeatedly updated database of sanction episodes and examine various features of sanctions and sanction policies. Kaempfer and

Lowenberg (2007) provide an excellent and comprehensive overview of the broader literature; see also Davis and Engerman (2003) for an introduction.

For our purposes, three strands of (empirical) literature are of particular relevance. A first set of papers examines the success of sanction policies. These papers examine whether target countries respond to sanctions in a way that the intended policy outcome of the sender country is achieved. As Hufbauer, Schott, Elliott, and Oegg (2007) note, the analysis of this question is a challenging task; both the definition of success as well as the contribution to success made by sanctions depends to a significant degree on a subjective evaluation.<sup>1</sup> Using an index ranging from 1 to 16 to assess more than 200 sanctions episodes, they classify about one in three cases as successful.<sup>2</sup> Biersteker, Eckert, Tourinho, and Hudáková (2013, p. 21) argue that UN targeted sanctions achieve their purposes 22 percent of the time.

In view of the frequent ineffectiveness of sanctions, another set of papers aims to identify the determinants of the success of sanctions. Early studies apply a variety of approaches to analyze case studies. Porter (1979), for instance, constructs a linear programming model to simulate the pressure of sanctions on the South African economy. Brandsma and Hughes Hallett (1984) use a macroeconomic model to analyze the impact of Western sanctions on the Soviet Union. More recent studies, making use of the Hufbauer, Schott, Elliott, and Oegg (2007) database, often apply a panel framework to test the effects of various sanctions-specific features on measures of sanctions outcomes. In this literature, many findings turn out to be sensitive to the exact model specification that is used.<sup>3</sup> However, reasonably robust results include that sanctions work best when goals are modest and limited, when the target country is politically unstable and economically weak, and when there are close economic ties between the sender and the target country (see, among others, van Bergeijk 1989, Lam 1990, and Jing, Kaempfer, and Lowenberg 2003).

Finally, and most closely related to our analysis, a number of papers examine the direct economic impact of sanctions. In contrast to work interested in the overall (mainly political) consequences of sanctions, these studies typically have a narrower focus, aiming to identify economic effects of sanctions. Some studies analyze developments in the target country. In medical science, for instance, there is an extensive discussion about the effects of

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<sup>1</sup> Levy (1999) convincingly illustrates this point by discussing different views about the role of trade sanctions in ending the apartheid regime in South Africa.

<sup>2</sup> For the 204 sanctions episodes listed at <http://www.piie.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).

<sup>3</sup> For instance, conflicting results are reported for the effects of the duration of sanctions and of the size of coalitions on sanctions success.

sanctions and embargoes on health, well-being and mortality (see, among others, Garfield, Devin, and Fausey 1995 and Daponte and Garfield 2000). Neuenkirch and Neumeier (2014) estimate that the imposition of sanctions has a sizable and significant negative effect on the target country's economic performance, while Lee (2016) shows that sanctions imposed on North Korea increase regional inequality and force North Korean exports to become more focused on human capital and natural resource intensive goods. Other papers assess the costs of sanctions to the sender country, such as Hufbauer, Elliott, Cyrus, and Winston's (1997) analysis of the effects of US economic sanctions for the US economy.

Generally, however, proper identification of damages from sanctions at the country level seems difficult. Therefore, using a more direct approach, a set of studies also aims to quantify the effect of sanctions on the extent of bilateral interactions, with a specific (and, in fact, almost exclusive) focus on trade. In these studies, a gravity model is typically applied to identify sanctions-related distortions in patterns of trade. Evenett (2002) and Haidar (2015), for example, analyze shifts in the export patterns of a single target country, examining evidence from South Africa and Iran, respectively. Caruso (2003) and Hufbauer, Schott, Elliott, and Oegg (2007) use large cross-country and panel data sets to analyze the trade effects of sanctions imposed by a single sender country, the United States. They find that US sanctions, in addition to imposing restrictions on US trade with the target country, also adversely affect a target country's trade with other countries. Slavov (2007) and Yang, Askari, Forrer, and Zhu (2009) focus explicitly on third country effects.

In our analysis, we extend previous work on the direct effects of sanctions along various lines. Since many restrictive measures are targeted at the financial sector, we analyze cross-border financial flows rather than trade. While financial sanctions are expected to also make the exchange of goods and services more difficult, thereby reducing trade, financial restrictions, such as the prohibition of buying and selling financial instruments issued by a targeted entity, should directly affect capital flows. Moreover, in addition to the aggregate effect on capital flows, we also explore the extensive and the intensive margin of cross-border financial activities. Allowing for differences in the intensity of sanctions, we analyze whether measurable effects are identifiable for the size of the coalition imposing sanctions and a tightening or easing of sanctions.

### 3. Financial Sanctions in Practice

In the European Union, within the framework of the common foreign and security policy, sanctions are (typically) imposed by the Council of the European Union.<sup>4</sup> The (Foreign Affairs) Council is responsible for the implementation of binding resolutions of the Security Council of the United Nations. This procedure requires the adoption of a legal instrument and an implementing Council Regulation. The Council may also decide to adopt restrictive measures autonomously, where, at the initiative of the Presidency, one of the member states or the European Commission, and after extensive political consultations, a Common Position is adopted which may foresee the implementation of restrictive measures.<sup>5</sup> Once the Regulation is in force, it automatically applies to all countries within the European Union. Thus, no further action (such as, for instance, ratification by national parliaments) is necessary.

The imposition of sanctions rarely implies that a country is cut off completely from the rest of the world. Instead, in order to prevent unwanted collateral damage, sanctions are often very specific, targeted measures (frequently labeled ‘smart sanctions’). For instance, an export embargo may be limited to specific goods and services (such as dual use goods, which can be used for both civil and military purposes); visa bans may be even more selective, applying to designated individuals only. As a general rule, from the wide range of possible restrictive measures which could be imposed by the European Union, measures which are considered to be most appropriate in order to achieve the desired outcome are implemented.<sup>6</sup> In recent years, the most frequently taken measures have been arms embargoes, economic and financial restrictions and restrictions on admission (that is, entry into a country).

In practice, financial sanctions can take many forms. Restrictive measures with strong financial content include, among others, limiting access to financial markets and restricting loans and credits, prohibiting the provision of financial services (e.g., brokering), restricting

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<sup>4</sup> For a detailed description, see [http://eeas.europa.eu/cfsp/sanctions/index\\_en.htm](http://eeas.europa.eu/cfsp/sanctions/index_en.htm).

<sup>5</sup> In view of this specific implementation procedure, and given that it is sometimes necessary to adopt measures, such as an asset freeze, as quickly as possible, EU member states are also allowed to take interim measures with regard to financial measures. In recent years, such exceptional measures have only rarely been taken, two-three weeks before the implementation of European Union sanctions, by the German Federal Ministry for Economic Affairs and Energy.

<sup>6</sup> Possible restrictive measures include diplomatic sanctions, suspension of cooperation, boycotts of events, trade sanctions (including arms embargoes), financial sanctions, flight and travel bans, and restrictions on admission; see [http://eeas.europa.eu/cfsp/sanctions/docs/index\\_en.pdf](http://eeas.europa.eu/cfsp/sanctions/docs/index_en.pdf).

international transfer payments, and restricting the sale and trade of property abroad.<sup>7</sup> However, the probably most prominent tool of financial sanctions, often targeted at specifically designated individuals, companies, or governments, is the freezing of foreign funds and assets. An asset freeze typically applies to all financial and economic resources of a targeted entity, including cash, checks, monetary claims, deposits with financial institutions, private and public securities and debt instruments, interest income, dividends and loans.

## 4. Data

Our main source of data is the Deutsche Bundesbank's balance of payments statistics. This register, which is compiled according to the International Monetary Fund's Balance of Payments Manual 5 (BPM5), regularly collects information on financial transactions between Germany and the rest of the world. The data set is complete. All individuals, firms and financial institutions located in Germany are required to report cross-border payments above a certain threshold to the Deutsche Bundesbank, allowing the central bank to establish the monthly balance of payments statistics.<sup>8</sup> The micro data are confidential; they are only accessible, often in anonymized form, at the headquarters of the Bundesbank in Frankfurt, Germany.

In its current version, the German balance of payments data base contains information on cross-border transactions in excess of 12,500 euro. For each single declaration, the value and the partner country of the transaction is provided, along with the name and address of the reporting unit (bank or corporation) as well as detailed information on the type of asset that is transferred (bonds, commercial paper, stocks, investment certificate, equity capital, credit and other capital).<sup>9</sup> The data set also provides information on who initiated a transaction. As a result, a capital inflow (outflow) may be either due to German investors selling (buying) foreign assets or foreign investors buying (selling) German assets. For a few types of transactions, exemptions exist such that there is no declaration necessary. These exemptions

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<sup>7</sup> For an early detailed assessment of financial sanctions, see Swiss Federal Office for Foreign Economic Affairs (1998).

<sup>8</sup> See Section 67 of the Foreign Trade and Payments Ordinance (*Außenwirtschaftsverordnung*), available at <http://www.bmwi.de/BMWi/Redaktion/PDF/A/awv-englisch,property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf>. As balance of payments entries on the activities of individuals are often based on estimates, we exclude transactions of individuals from our data set.

<sup>9</sup> In addition to the type of asset, further information on the traded assets is available such as, for instance, the issuer (private/public) and the currency (domestic/foreign) of bonds. With this fine disaggregation at the product level, the monthly data gets close to transaction-level data.

are: payments below the threshold of 12,500 euro,<sup>10</sup> payments related to the export and import of goods, (re-)payments related to short-term loans (duration of less than 12 months), paid short-term deposits to foreign monetary institutions and payments which are forwarded to other foreigners. The frequency of the data is monthly, with information provided at the end of the month. Our sample covers the period from January 2005 to December 2014.

Information on financial sanctions is obtained from the service center ‘Financial Sanctions’ of the Deutsche Bundesbank.<sup>11</sup> This unit, which is responsible for the implementation of European Union Regulations on financial sanctions in Germany, has collected detailed data on executive orders. Table 1 provides a list of sanctions by the European Union along with a brief description of the measures that are taken.<sup>12</sup> 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 Comoros, the sanctions have also been lifted completely during our sample period. Along with information on the removal of restrictive measures which were imposed before 2004, these episodes provide additional variation for the identification of the effects of sanctions.

Almost all target countries are of small importance for Germany’s international financial relationships. Often, the countries are economically small and/or poorly developed. Figure 1 shows that, with the exception of Russia, none of the target countries accounts for more than 0.03 percent of German cross-border capital flows.

Table 2 describes our financial data in more detail. As noted above, the raw data are highly disaggregated, with separate statistical entries on monthly capital flows by declarant, partner country and asset class, effectively coming close to transaction-level data. In order to partly reduce the complexity of the data, Table 2 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.

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<sup>10</sup> However, there are observations below this threshold in our data set, for three possible reasons: the information is provided voluntarily; there are some exceptions of this threshold for banks (e.g., income from securities, purchase/sale of currencies); the unit reports a single transaction instead of the total amount.

<sup>11</sup> See [http://www.bundesbank.de/Navigation/EN/Service/Financial\\_sanctions/financial\\_sanctions.html](http://www.bundesbank.de/Navigation/EN/Service/Financial_sanctions/financial_sanctions.html).

<sup>12</sup> For episodes in which sanction measures are mainly composed of export restrictions (such as Uzbekistan), these restrictions also often affect financial transactions (including, for instance, the prohibition of financing or financial assistance related to military activities, including in particular grants, loans and export credit insurance).

Table 2 illustrates the various features and dimensions of our (raw) balance of payments data. For each country-month pair, there are, on average, about 128 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 reporting unit (or declarant). Overall, there is broad trading activity, especially by foreign investors, which is particularly concentrated in bonds and stocks.

More interestingly, and perhaps not surprisingly, given the irrelevance of many sanction targets as a financial partner noted above, bilateral interactions with sanctioned countries are rare. Sanction episodes account for only 7 percent of our sample. Also, capital flows under sanctions are, on average, of smaller, although still sizable, magnitude. There are fewer balance of payments transactions, reported by a smaller number of declarants and involving fewer asset classes. While these findings potentially reflect greater (sanction-related) administrative hurdles, cross-border capital flows could have also been affected by other factors unrelated to financial sanctions. Therefore, we next apply a regression analysis to tackle this issue empirically.

## 5. The Effects of Imposing Sanctions on Capital Flows

### 5.1 Benchmark Results

We begin our empirical analysis by exploring the (permanent) effect of financial sanctions on cross-border capital flows. In particular, we estimate variants of the following differences-in-differences (or, more generally, fixed effects) model:

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

where  $\text{Flow}_{ct}$  is a measure of German financial activity with country  $c$  at time  $t$ ,  $\text{Sanctions}_{ct}$  is an indicator variable that takes the value of one when sanctions are imposed (and is zero otherwise),  $X$  is a vector of auxiliary control variables, and we include a full set of country-specific ( $\eta_c$ ) and time-specific ( $\phi_t$ ) fixed effects. The coefficient of interest to us is  $\beta$ , the ‘treatment effect’ of sanctions on cross-border financial activities. Throughout the analysis,

we estimate regressions with OLS and apply heteroskedastic 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 (observations of no flows), in the raw data.

Our default measures of the intensity of bilateral financial interactions between Germany and countries (or, more precisely, territories) in the rest of the world are (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). In the empirical literature on capital flows, many studies focus on net flows in order to identify and analyze extreme capital flow movements. Prasad (2011), however, notes that while net flows tended to decrease over time, gross inflows and outflows have increased sizably in recent years. Along similar lines, Forbes and Warnock (2012) highlight the importance of the analysis of gross capital flows.

In a preliminary check, we examine the time-series properties of our capital flow measures. Fortunately, the Im-Pesaran-Shin unit-root test consistently rejects the null hypothesis of unit roots, allowing us to analyze (log) levels rather than differences.<sup>13</sup> Moreover, since the cross-section dimension sizably exceeds the time-series dimension, with 219 countries and 120 months, we use panel estimation techniques (instead of time series econometrics).

Benchmark estimation results are reported in Table 3. Columns 1 to 4 tabulate the results for the most parsimonious specification of equation (1) which includes, in addition to the sanctions dummy, a vector of country dummies that control for mean differences in German capital flows across partner countries, and time dummies that control for monthly variations in capital flows common to all partners. As shown, our estimates of  $\beta$  are consistently negative, economically sizable, statistically highly significant and stable in magnitude across the four measures of financial flows. The point estimate of about -0.7 implies that after the imposition of financial sanctions, German capital flows with the target country decrease, on average, by about 50 percent ( $\approx \exp(-0.7)-1$ ). Moreover, in line with intuition, the effect turns out to be larger for capital outflows than for capital inflows as many sanction measures (such as freezing of assets) specifically aim to restrict a target country's access to international capital markets.<sup>14</sup> Interestingly, the  $\beta$  coefficient also takes a

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<sup>13</sup> Pesaran's panel unit root test in presence of cross section dependence yields similar results.

<sup>14</sup> The observed decline in capital outflows implies a decline in financial transfers to the target country either because German residents buy fewer foreign assets or because foreigners sell fewer German assets.

significantly negative value for net flows, indicating that the imposition of sanctions also tends to reduce imbalances in bilateral capital flows.

In the remaining four columns of Table 3, we extend our specification of equation (1) by including a set of additional (time-varying) country variables; these controls are intended to capture determinants of capital flows beyond plain country fixed effects. Following Forbes and Warnock (2012), we use a country's stock market capitalization as a percent of GDP, the Chinn-Ito index of capital account openness, the public debt to GDP ratio, real GDP growth, and log real GDP per capita.<sup>15</sup> For these macroeconomic control variables data are available at yearly frequency only and matched accordingly.

Reviewing the results, the extension seems to work well. The coefficients on additional country controls take the expected signs and are precisely estimated, except for per capita income (for which the estimated coefficient is often statistically indistinguishable from zero). For instance, capital market size, financial openness and macroeconomic performance are all positively associated with capital flows. Similarly, the results indicate that capital flows tend to decrease for greater partner country indebtedness. However, the increase in the number of regressors also comes at a cost: sample size is reduced by more than two-thirds for this specification due to limited data availability. For some variables data are available only for a limited set of countries and data for the period after 2012 are often missing. More notably, with this extension, our core results remain quantitatively and qualitatively unchanged. Our estimates of  $\beta$  turn out to be remarkably robust, indicating a notable decline in cross-border financial activity after restrictive measures have been adopted.

In similar fashion, the estimation results remain basically unaffected when country-month pairs with no recorded capital flows are dropped from our analysis. Since our dependent variable is the logarithm of a capital flow, we follow standard practice and add a small value (of one) to the recorded values of a capital flow. Dropping these observations instead may bias the results, especially when financial sanctions are strictly enforced such that no transactions are reported in the official balance of payments statistics. As Table 2 shows, however, we lose only about 4,500 observations (~17% of the sample) due to zeros. For comparison, the results with omitted zero flows are tabulated in Appendix Table 1.

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<sup>15</sup> All data have been obtained from the World Bank's [World Development Indicators](http://web.worldbank.org), except for the Chinn-Ito index, which has been downloaded from [http://web.pdx.edu/~ito/Chinn-Ito\\_website.htm](http://web.pdx.edu/~ito/Chinn-Ito_website.htm). Following Forbes and Warnock (2012), real GDP growth measures the growth shock defined as the deviation between actual growth and trend growth.

Next, we examine the contribution of intensive and extensive margins to the aggregate effect of sanctions on capital flows. Following standard practice in the empirical trade literature (and making use of the disaggregate structure of our balance of payments data set), we decompose the aggregate value of German capital flows with a partner country into various factors, including the unique number of reporting units that declare financial transactions with that country, the unique number of asset classes in which business has taken place, and the average value of capital flows by declarant-asset pair.

Table 4 reports results of our decomposition exercises. Each of the rows in the table presents estimation results for a different dependent variable with the regressand tabulated in the first column on the left of the table. The eight columns correspond to the specifications of equation (1) in Table 3 (including additional country controls for columns 5-8), but, in contrast to Table 3, we only report estimates for the coefficient of interest,  $\beta$ . The first row of Table 4 replicates the results shown in the first row of Table 3.

In our first decomposition, we analyze the effects of sanctions on the number of entries in the German balance of payments statistics per country-month pair and the average value of capital flows per statistical entry. Confirming our earlier descriptive findings, the imposition of sanctions is associated with a sizable decline in cross-border financial activities; the number of entries decreases sharply during sanction episodes, with the point estimates implying a decline, depending on specification, by between 25 and 28 percent. Interestingly, the estimate of  $\beta$  also takes significant negative values for the average flow per entry as regressand. Contrary to the assumption of greater administrative hurdles for transactions under sanctions, which would imply that only large-scale activities may still be profitable once restrictive measures have been imposed, the value of the average transaction falls sizably, by between 24 and 36 percent.

Another decomposition provides an even more detailed assessment of cross-border capital flows, distinguishing balance of payments entries by declarant and by asset category. For both extensive margins, we obtain consistently negative  $\beta$  coefficients, implying that the observed decline in the number of statistical entries under sanctions is due to both a drop in the number of reporting units and a reduction in the number of asset classes in which activities are declared. According to our estimates, the number of declarants decreases by some 25 percent, while the number of asset classes decreases by between 5 and 8 percent. Similarly, for the intensive margin, which is now defined as the average value of a capital flow with a partner country in a specific asset category by a given declarant, we again observe

a decrease during sanctions, on the order of a 33 percent reduction. We consider this result reassuring.

## 5.2 Robustness

We check the robustness of our results extensively. Table 5 presents the results of one particularly interesting experiment in which we analyze the responsiveness of assets involved in transactions to the introduction of restrictive measures by their geographic origin. Specifically, we ask whether there are differences in how sanctions affect financial flows based on whether they involve German or foreign assets. While we observe a significant decline in capital flows for both groups of assets, the results are, unfortunately, not very conclusive with respect to possible differences in sensitivity. As before, columns 1 to 4 of the table contain the results for our parsimonious specification of equation (1). For this set of regressions, the estimated sanctions effect is considerably larger in magnitude for transactions of foreign assets. However, this finding is not robust to the inclusion of additional country controls, possibly also as a result of the reduction in sample size.<sup>16</sup>

In another robustness check, we investigate the sanctions effect by asset category. The results are tabulated in Table 6. Again, our main results turn out to be reasonably robust. Of the 36 estimated coefficients, 23 (19) take a negative sign (and are different from zero at conventional levels of statistical significance). Especially for asset categories with large-scale transaction values (such as bonds, commercial paper and stocks), the estimation results are of comparable magnitude to our aggregate estimates.

## 5.3 Adjustment and Anticipation

Financial funds can move quickly. Therefore, for some types of restrictive measures, such as a freeze of assets, quick implementation is an essential feature. As a result, sanctions are expected to have an immediate impact on capital flows. However, measures are also often targeted at designated persons and organizations, such that their effect on total capital flows may be limited; bilateral financial relationships may only gradually deteriorate over time.

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<sup>16</sup> We obtain similar results if we undertake the intensive and extensive margin decompositions by asset origin. Both types of investors experience a reduction in activity due to sanctions. However, there are no clear patterns in terms of the direction of differences between the two groups of assets.

Likewise, capital flows may already respond in anticipation of the imposition of sanctions. Overall, the speed of adjustment of capital flows to newly imposed sanctions is an interesting empirical issue to which we turn next.

To analyze the time pattern of the sanctions effect, we replace our financial sanctions dummy variable in equation (1) with leads and lags of the imposition of restrictive measures. Specifically, we estimate equations of the form:

$$(2) \quad \text{Log}(\text{Flow}_{ct}) = \alpha + \sum_k \beta_k \text{Imposition}_{ct-k} \{ + \gamma X_{ct} \} + \eta_c + \phi_t + \varepsilon_{ct}$$

where  $\text{Imposition}_{ct-k}$  is a binary dummy variable which takes the value of one if sanctions were imposed on country  $c$  at time  $t-k$  (and is zero otherwise). Again, we use different measures of bilateral financial interactions. We also experiment with different numbers of leads and lags and several variants of our specification (with and without additional country controls), without much effect.

Figure 2 displays results for our four measures of cross-border capital flows at quarterly frequency.<sup>17</sup> The panels show the point estimates of  $\beta$ , with  $k$  running from  $-2$  to  $+4$ , along with the corresponding  $\pm 2$  standard error band. As before, and reassuringly, we observe a substantial negative effect of sanctions on financial activity. The estimated quarterly indicator variables take values of sizable economic magnitude. More notably, cross-border interactions already decline before the imposition of restrictive measures; bilateral capital flows tend to be already disproportionately low in the quarter before restrictive measures are in place. Thus, we find evidence suggesting that there may be some anticipation effects leading to a reduction in financial flows prior to the imposition of sanctions. It is also possible that the reduction in flows before the onset of sanctions is not due to anticipation of sanctions, but rather due to a deterioration in local political and economic conditions in the target country which is usually a consequence of events and policies undertaken which result in sanctions. With sanctions, however, there is a further notable deterioration in financial activity, but after two quarters the effect seems to gradually peter out.

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<sup>17</sup> Coefficients at monthly frequency yield a similar pattern, though they are less precisely estimated.

To get a better understanding of whether the reduction in flows before sanctions are imposed are due to anticipation or general deterioration of economic conditions, we attempt to identify a period of time before the sanctions where anticipation is plausible. To do this for every sanction we note the event which precipitates sanctions and the date when sanctions are imposed (see Table 1). To be precise, in the case of sanctions imposed on Russia in the wake of its annexation of Crimea, it is unlikely that sanctions could have been anticipated prior to Russian engagement on Crimea. Thus, anticipation is plausible only once Russia becomes involved in Crimea and the EU expresses its unhappiness with Russian involvement. We then define a pre-sanction dummy which identifies the months prior to the imposition of sanctions when anticipation is plausible and re-estimate our specification given by equation (1).

Our results from this experiment, reported in Table 7, indicate that there likely were no anticipation effects. Six of eight pre-sanction coefficients are estimated to be negative, but only one is statistically significant, while the remaining five coefficients are imprecisely estimated at conventional levels of significance. This leads us to conclude that there are no or, at best, only small anticipation effects and that the reduction in capital flows prior to the imposition of sanctions, identified in Figure 2, is due to the general worsening of local political and economic conditions as a consequence of the events or policies which ultimately lead to sanctions being imposed. To return to the case of Russian sanctions, our results suggest that the reduction in financial flows between Germany and Russia prior to sanctions being imposed on Russia is not due to an anticipation of sanctions being imposed, but rather due to the overall uncertainty created by the events themselves and the usual reluctance of firms to operate in war zones.

## **6. Evading Sanctions**

### **6.1 Evasion**

A policy question of notable interest is how firms in the sender country respond to sanctions as their response largely determines the success of sanctions. If individuals and firms find ways to circumvent or avoid restrictive measures and, thereby, are able to continue their business operations, sanctions may be ineffective. The question is also of importance for an assessment of the costs of sanctions to the sender country. If restrictions are binding

(and/or retaliatory measures are taken by the target country), the imposition of sanctions may also have notable negative effects on the sanctioned sectors in the sender country.

In our empirical strategy to analyze this issue, we make use of the highly disaggregated structure of our data which allows us to observe activities by individual declarant. As a result, we are able to identify German reporting units which declared activities with sanctioned countries in the 12 months before restrictive measures were imposed. Examining firm activities with non-sanctioned countries, we analyze differences in the activities between declarants affected (or ‘treated’) by sanctions and declarants without any business operations with target countries. Specifically, we estimate equations of the form:

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

where  $\text{Flow}_{ct}^d$  is a measure of German financial activity of declarant  $d$  with country  $c$  at time  $t$ ,  $\text{Affected Declarant}_{ct}^d$  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 ( $\eta_c^d$ ) and time specific ( $\phi_t$ ) fixed effects. Again, it should be noted that direct effects of sanctions are ignored (or, more precisely, ruled out) in our analysis by our exclusive focus on a sample of non-sanctioned countries. In other words, we examine whether firms affected by sanctions increase their activity in third countries after sanctions were imposed on countries where they were active before. Accordingly, the estimate of  $\beta$  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 contains eight columns. Analogously to our benchmark analysis, we tabulate estimates for our four measures of bilateral capital flows, using a highly parsimonious specification of equation (3), as well as additional control variables. As before, however, sample size is reduced considerably for this extended specification. More notably, while the variables take sensible and significant coefficients, the effect of this modification on the main results is negligible.

Turning to the variable of interest, the estimates of  $\beta$  are consistently positive and economically and statistically significant. The estimates indicate that investors affected by sanctions policies tend to sizably expand their activities with other countries, by 6 to 12 percent. One plausible explanation for this finding is that ‘treated’ declarants are highly flexible, exploring alternative business opportunities. Another possible explanation, however, is that declarants continue business operations with target countries, via extended transactions with third countries, such that sanctions would be largely ineffective. In other words, it is possible that affected declarants are circumventing the sanctions by using third countries as intermediaries. While we are unable to distinguish between these different explanations directly, we pursue an alternative strategy of identifying circumvention.

We hypothesize that if it is possible to circumvent sanctions, circumvention is more likely and easier to do if sanctions are imposed by a relatively small set of countries. Sanctions in our data are imposed either by the EU alone or by the entire UN. Sanctions imposed by the UN are more likely to be enforced by a large number of countries making circumvention difficult. Sanctions that only EU imposes will be enforced by EU member countries, but not by any other country. As a result, it may be feasible for affected firms to continue carrying out transactions with sanctioned countries by going through a third country which functions as an intermediary.

To examine this possibility we identify a target country’s five largest trading partners in the 12 months before the imposition of sanctions.<sup>18</sup> These are the countries which may be more likely to serve as an intermediary. Specifically, we argue that a relative increase in the financial relationships of ‘treated’ units with countries which are major trading partners of sanctioned countries can be interpreted as evidence of sanction evasion. In addition, we distinguish between UN and EU sanctions, arguing that the effects should be smaller, if any, for UN sanctions as the (geographic) evasion of sanctions seems to be generally more difficult when every UN member country imposes sanctions.

Estimation results are tabulated in Table 9. Instead of using a single measure to quantify cross-border financial activities of reporting units affected by the imposition of sanctions, we now use six measures, differentiating between the type of sanctions (EU, UN) and the destination of third-country capital flows (top 5 trading partner of the target country,

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<sup>18</sup> Monthly data on bilateral values of trade between countries is 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.

rest of the world). As shown, the results are indicative of evasion behavior. For sanctions which have been imposed only by the European Union, the estimated coefficients on the interaction terms take positive (and significant) values, indicating an increase in financial activities. Furthermore, the increase is larger, in both a statistical and an economic sense, for transactions with countries with close economic ties with sanctioned countries, indicating that those countries may serve as an intermediary in evasion of sanctions. Depending on the flow, financial transactions with largest trading partners of sanctioned countries increase from 40 percent to almost 100 percent more relative to transactions with all other countries.

While these findings do not necessarily imply direct evidence on the evasion of sanctions, our evasion hypothesis is reinforced by the estimation results for sanctions imposed by the United Nations. For UN sanctions, transactions of ‘treated’ firms with non-sanctioned countries decrease for both major trading partners and all other trading partners of target countries. These results likely indicate that one plausible alternative explanation for our estimation results on EU sanctions does not hold. Specifically, the increase in transactions with other countries that we observe for firms affected by EU sanctions could be due to firms seeking to diversify their international portfolio. However, there is no reason not to expect such behavior in the case of sanctions levied by the entire UN. The fact that we see no such change in the case of UN sanctions, increases our confidence that at least some part of the observed increase in transactions with largest trading partners of sanctioned countries in the case of EU sanctions is due to evasion.

## 6.2 Financial Centers

It may be argued that our analysis misses the role of international financial centers. Instead of taking the form of direct transactions with specific countries, a substantial portion of German capital flows may take place through foreign intermediaries. More importantly, there is the risk that legally sanctioned transactions are simply re-routed through offshore centers once sanctions are put in place.

Reassuringly, we find no strong evidence for these claims. Figure 3 plots the shares in German capital flows for three European countries with major financial centers, the United Kingdom (London), Luxembourg (Luxembourg), and Switzerland (Zurich). As shown, the importance of these places as source and destination of German capital flows is indeed

noteworthy, a statement that particularly holds true for Luxembourg, given the (small) size of the country. Still, these countries are far from dominant for German capital flows. Moreover, their relevance as a counterpart for German financial transactions has, if anything, declined.

In Table 10, we provide estimates for the effect of sanctions on cross-border capital flows with international financial centers. Specifically, we use the same default model as in Table 3, but, in addition to flows with target countries, we also analyze flows with financial centers after the imposition of a sanction. In the practical implementation of this approach, we augment our model with a dummy variable that takes the value of one if the capital flow is with the United Kingdom, Luxembourg, Switzerland, the United States, Japan, and Singapore and a sanction has been imposed during the past 6 months (and is zero otherwise).<sup>19</sup> As a result, we hypothesize that any evidence of re-routing shows up in our estimates as an increase in capital flows with financial centers (under the assumption that sanctions have not been imposed by these countries as well). Since none of the estimated coefficients on this variable takes a statistically significant value, however, we conclude that this type of evasion behavior does not seem to be of major relevance.

### 6.3 Net Errors and Omissions

In a further exercise, we examine another potential channel of evading sanctions, the misreporting of financial transactions. To the extent that these transactions are recorded in the balance of payments statistics at all (and do not go completely underground), they may possibly show up in the residual category of the balance of payments, net errors and omissions. This category ensures that the balance of payments accounts sum to zero. However, this information is only available at the aggregate level for all partner countries, implying one entry per month.

Figure 4 plots the net errors and omissions category in German balance of payments for the sample period. The upper panel shows the balance (which may take positive or negative values); the lower panel graphs the change in the balance against the previous month. Marking the months in which sanctions were imposed by vertical lines, no clear pattern is visually observable.

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<sup>19</sup> In unreported results, we also experiment with different time windows, separate groups of countries (distinguishing between European and non-European financial centers) and a more comprehensive list of offshore centers, without much effect.

To empirically identify potential irregularities at the time of the imposition of sanctions, we next estimate equations of the form:

$$(4) \quad \text{Balance}_t = \alpha + \beta \text{Sanction}_t + \lambda_m + \zeta_y + \varepsilon_{ct}$$

where  $\text{Balance}_t$  is the value of net errors and omissions at time  $t$ ,  $\text{Sanction}$  is a dummy variable which takes the value of one when sanctions have been imposed in  $t$  (and zero otherwise), and we include comprehensive sets of month and year fixed effects.

Table 11 tabulates the results. Again, we experiment with different measures for the dependent variable. For instance, in addition to the nominal value, we also examine monthly changes and absolute values, without much effect. None of the estimated coefficients is statistically distinguishable from zero, indicating that no pattern in net errors and omissions category of the German balance of payments is identifiable for months in which sanctions were imposed.

## 7. Varying the Strength of Sanctions

### 7.1 Breadth

Restrictive measures often come with different intensities: sanctions may be limited to specific areas; they may be targeted at specific entities; they may be imposed by different groups of countries. We next investigate the impact of various features of sanctions on cross-border financial flows.

We begin our analysis by examining the difference between sanctions imposed by the United Nations (and subsequently also adopted by the European Union) and measures autonomously imposed by the European Union. In addition to the possible difference in extent of evasion, it is possible that sanctions imposed by the UN have a different effect in magnitude than those imposed by the EU alone. Interestingly, in the literature on the success of sanctions, there is some notable debate about the effect of the size of the sanctioning coalition. In fact, contrary to intuition (and insights from theory), many empirical studies find

that multilateral cooperation among sanctioners lowers the probability of sanctions success (see Kaempfer and Lowenberg 2007 for a summary).

In order to identify possible differences in the effect of UN and EU sanctions on cross-border capital flows, we augment equation (1) with an additional dummy variable which takes the value of one when sanctions are imposed by the United Nations (and is zero otherwise). Consequently, the estimated coefficient on this variable captures the extent to which financial activities respond differently to restrictions imposed by the two differently-sized groups of sanctioners.

The results in Table 12 indicate that there is no measurable difference in the impact of UN and EU sanctions on financial flows. Although the coefficient on UN sanctions varies in sign across specifications, the coefficient is typically statistically indistinguishable from zero at any conventional level of confidence.

We also examine different types of sanctions, distinguishing between financial sanctions only and a broader set of restrictive measures (including, for instance, export restrictions and travel bans).<sup>20</sup> As shown in Table 13, a more encompassing set of restrictive measures has stronger effects on capital flows, showing a significantly larger decline in cross-border activities.<sup>21</sup>

## 7.2 Strength

In another exercise, we make use of information on the detailed timeline of sanctions measures. With this data, we are able to identify, in addition to the impact of the imposition of sanctions, the effects of taking additional restrictive measures (and, thereby, strengthening sanctions) or lifting some previously imposed measures (and, thereby, easing sanctions). Again, we isolate these effects by including two additional dummy variables in equation (1), our baseline regression model. For simplicity, we limit our attention to episodes of a first adjustment in sanctions measures. Moreover, since we focus exclusively on timing (and ignore information on actual measures that were taken), we consider this a particularly demanding exercise. Results from this approach to examining whether initial changes in the

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<sup>20</sup> On the following target countries only financial sanctions were imposed: Congo (Dem. Rep.), Lebanon, Tunisia, Egypt, Afghanistan, Guinea-Bissau, Central African Republic, and Sudan.

<sup>21</sup> In Appendix Table 2, we tabulate results for individual sanction measures which have been taken. Again, our key findings turn out to be reasonably robust.

intensity of sanctions have an impact on financial flows are shown in Table 14a. Overall, we find little evidence in support of either strengthening or easing of sanctions having an effect.

We also experiment with replacing our plain binary sanctions dummy with a sanctions index. This index starts from the value of zero when no sanctions are imposed and is designed to take the value of one when the intensity of sanctions reaches its maximum, as measured by the number of sanctioned individuals and institutions, during the observed episodes. As before, we focus exclusively on the timing of sanction policies, that is, on changes in the number of targeted individuals. Specifically, we interpret an increase (decrease) in the number of targeted individuals as a tightening (loosening) of sanctions.<sup>22</sup> This is a richer approach than our first approach as it does not focus only on the first change in the intensity, but rather varies during the entire episode. Thus, an increase in this index indicates an increase in the intensity or restrictiveness of sanctions. As shown in Table 14b, the  $\beta$  coefficients are more precisely estimated and increase in magnitude. This richer approach then reveals that increasing the restrictiveness of sanction does result in additional reductions in flows, and vice versa when sanctions are relaxed.

### 7.3 Lifting

Our sample also covers a few episodes in which previously imposed European Union regulations have been repealed, lifting sanction measures completely. These episodes include the lifting of measures imposed on Uzbekistan and the Comoros during our sample period as well as the lifting of sanctions (in November 2011) which were imposed on former Yugoslavia in the 1990s.<sup>23</sup> As a result, we can replicate our differences-in-differences analysis for the removal (instead of the imposition) of sanctions. For completeness, we also include our baseline measure for imposed sanctions.

Table 15 reports the results of this exercise. The estimates of  $\beta$  take a consistently positive sign and are always statistically highly significant, indicating a considerable increase in cross-border financial flows after the elimination of restrictions. The point estimate of about 0.95 imply that after the lifting of financial sanctions, German capital flows with the

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<sup>22</sup> Consider, for example, the case of Belarus. After the imposition of sanctions, the list of targeted individuals and institutions has been extended eight times and was subsequently reduced three times. Accordingly, the value of our sanction index gradually increases from 1/9 to 1 and then drops to 6/9.

<sup>23</sup> In our actual implementation, we classify Serbia (as one of the successor states of the former Yugoslavia) as the country for which sanctions have been lifted.

(former) target countries increase, on average, by about 160 percent. The interpretation of this particular result, however, warrants a cautionary note as the estimates are based on only two episodes of the lifting of the sanctions as no data for financial flows with the Comoros are available.

## **8. Conclusions**

This paper examines the effect of financial sanctions on German cross-border capital flows. While sanctions can be expected to hinder international transactions, thereby putting pressure on a target country, we study the patterns of adjustment in bilateral relationships after the imposition of a sanction along various dimensions. Our analysis is based on highly disaggregated data from the German balance of payments statistics from 2005 through 2014. During this time, financial sanctions were imposed on 20 countries and have not been lifted, except for two countries. Applying a differences-in-differences approach, we find that sanctions have a strong and immediate negative effect on cross-border financial flows.

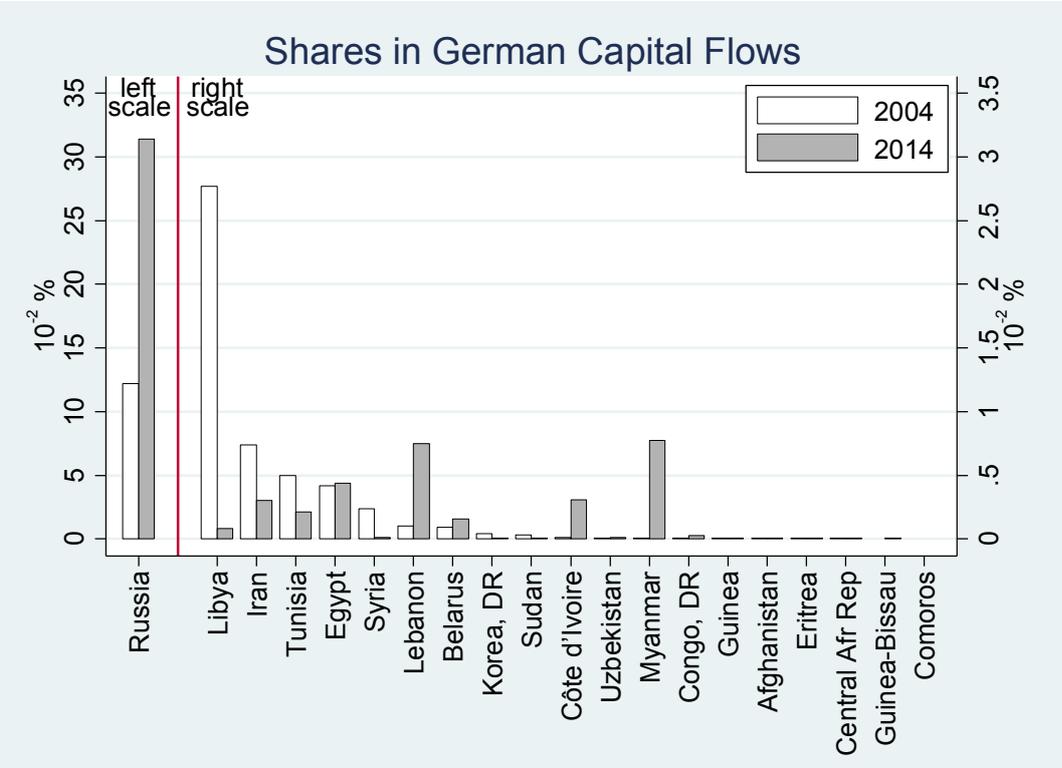
Although our empirical findings are derived from data of only one (sender) country, Germany, they provide a number of interesting policy implications. First, sanctions reduce capital flows, both inflows and outflows. Sanctions also work across the board; they do not only lower the value of financial flows, but also lessen the number of transactions and the number of asset categories. Overall, sanctions imply costs for both the target and the sender country. Second, if only a subset of countries imposes sanctions, in these cases the EU, there seems to be rampant evasion through third countries. In other words, UN sanctions seem far more effective in cutting off capital flows than EU only sanctions, indicating that the effect of EU only sanctions may be more in the political area than the economic area. Third, we find little evidence of anticipation effects, though this may be a consequence of sanctions being imposed soon after the stated reason for them (usually two months). Fourth, the easing or strengthening of sanctions does seem to matter. Thus, changing the intensity of sanctions may not only serve as a political signal, but also as an economic one.

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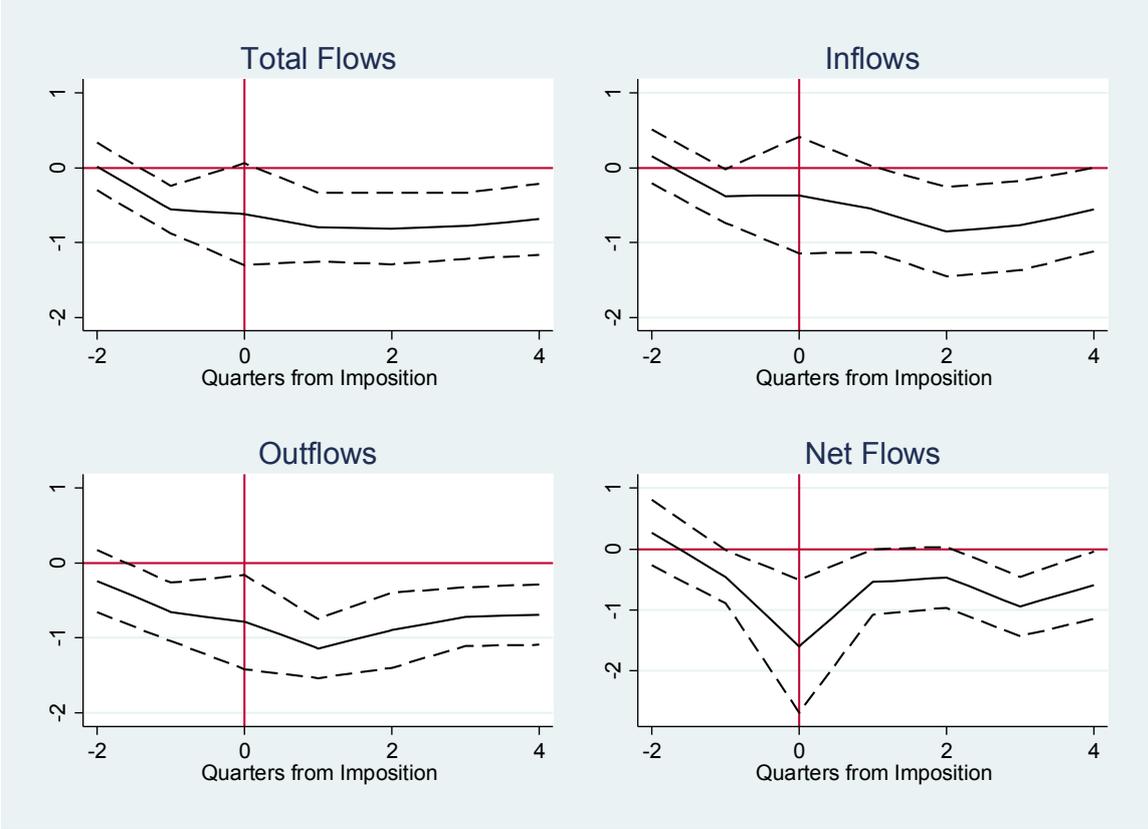
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**Figure 1: The Relevance of Target Countries for German Cross-Border Capital Flows**



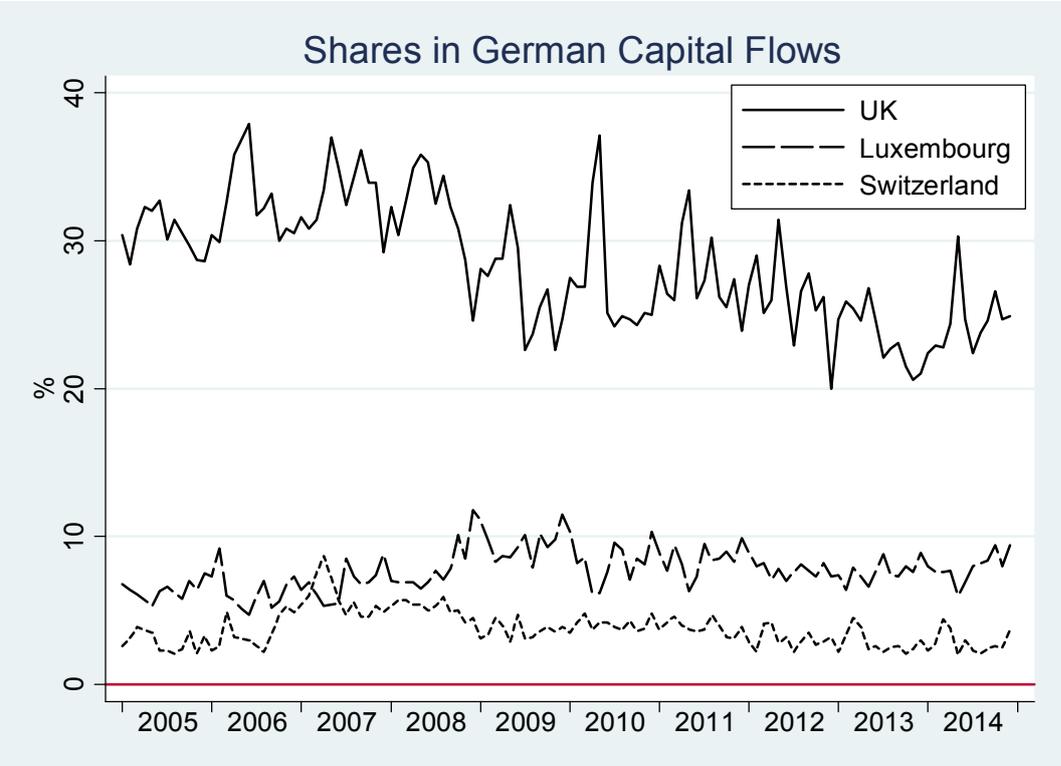
Source: Deutsche Bundesbank.

**Figure 2: The Effects of Sanctions on Cross-Border Capital Flows**



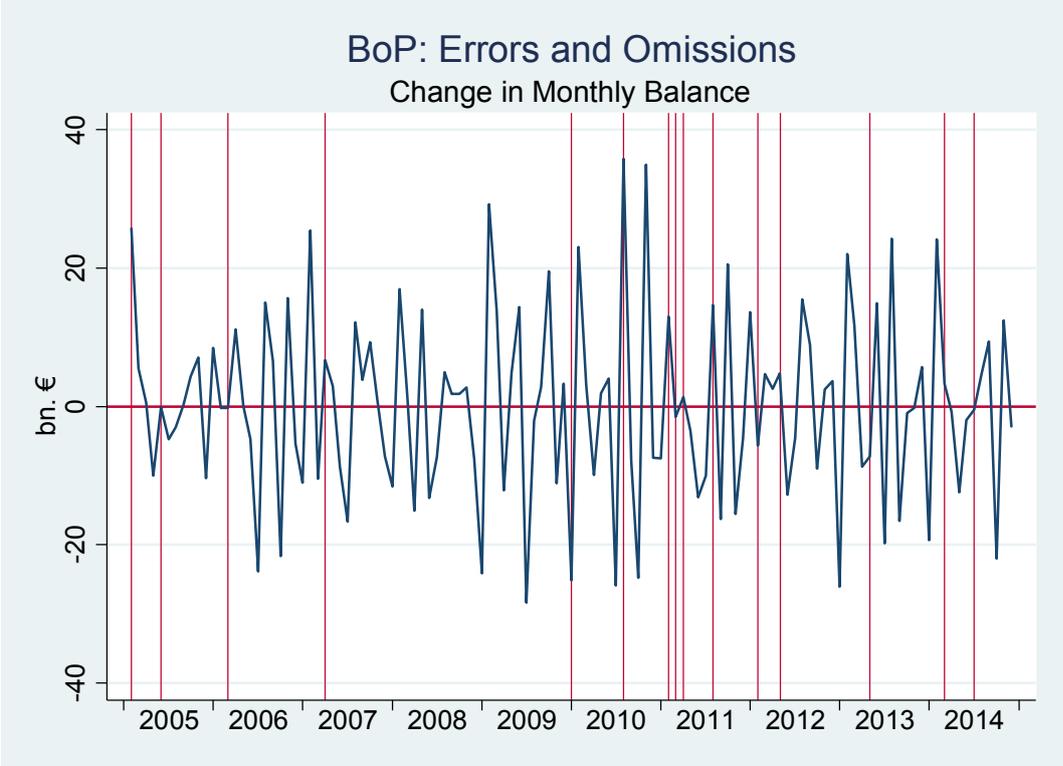
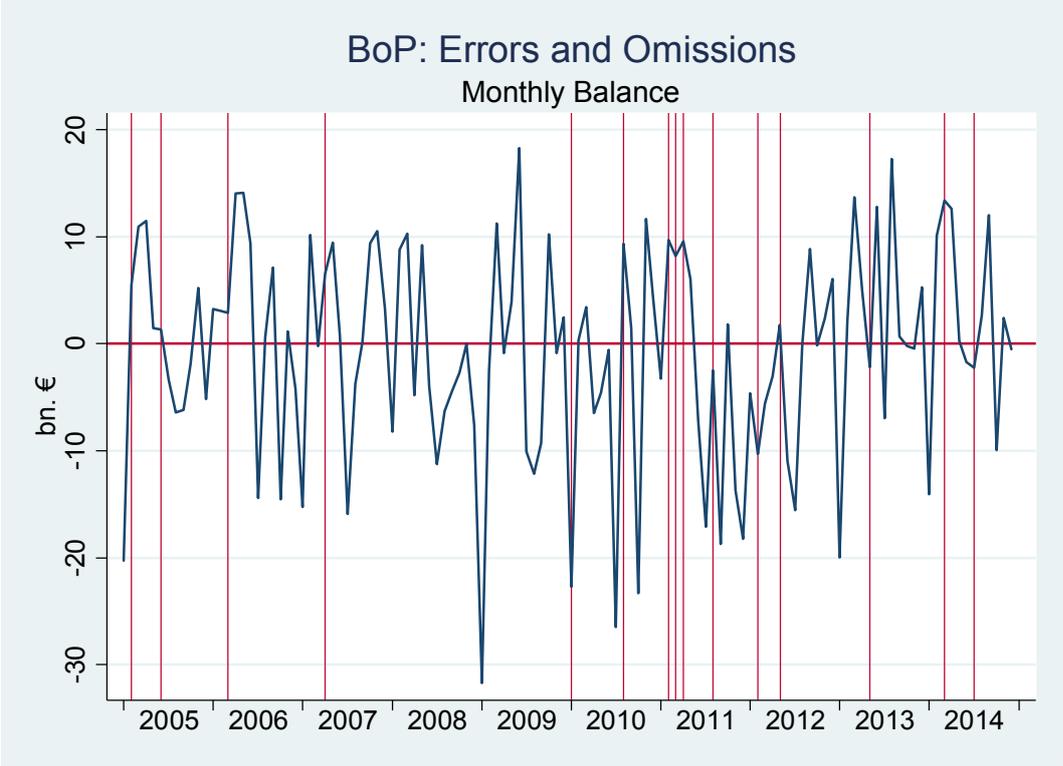
Source: Deutsche Bundesbank.

**Figure 3: The Role of Financial Centers**



Source: Deutsche Bundesbank.

**Figure 4: The Effects of Sanctions on Errors and Omissions in the Balance of Payments**



Source: Deutsche Bundesbank.

**Table 1: List of Financial Sanctions, 2005-2014**

<b>Country</b>	<b>First announcement (Lifted)</b>	<b>Measures taken</b>	<b>Cause cited in declaration</b>	<b>Date of event</b>	<b>First announcement of sanction</b>	<b>Sanctions initially imposed by</b>
Côte d'Ivoire	31 January 2005	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment	Ceasefire violation	15 November 2004	31 January 2005	UN
Congo, Dem. Rep.	13 June 2005	Freezing of assets and economic resources of natural persons and establishments	Violation arms embargo	18 April 2005	13 June 2005	UN
Uzbekistan	14 November 2005 (27 October 2009)	Export restriction on goods related to nuclear technology	Massacre in Andijan	13 May 2005	14 November 2005	EU
Lebanon	21 February 2006	Freezing of assets and economic resources	Assassination of former Lebanese Prime Minister	14 February 2005	21 February 2006	UN
Belarus	18 May 2006	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment	Presidential elections	19 March 2006	18 May 2006	EU
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	Nuclear test	9 October 2006	27 March 2007	UN
Comoros	03 March 2008 (27 May 2008)	Freezing of assets and economic resources of natural persons	Invasion of Anjouan	3 March 2008	3 March 2008	EU
Guinea	22 December 2009	Freezing of assets and economic resources of natural persons; export restriction on military equipment	Violent repression	28 September 2009	22 December 2009	EU
Eritrea	26 July 2010	Freezing of assets and economic resources; export restriction on military equipment	Border dispute with Djibouti and support of Somalia; AU summit declaration calling for sanctions	3 July 2009	26 July 2010	UN
Tunisia	4 February 2011	Freezing of assets and economic resources of natural persons	Situation in Tunisia	18 December 2010	4 February 2011	EU
Libya	2 March 2011	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment	Situation in Libya	17 February 2011	2 March 2011	UN

Egypt	21 March 2011	Freezing of assets and economic resources of natural persons	Situation in Egypt	25 January 2011	21 March 2011	EU
Iran	12 April 2011	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment, chemicals and other resources (gold, silver, ...)	Deterioration of human rights situation in Iran	21 March 2011	12 April 2011	EU
Afghanistan	1 August 2011	Freezing of assets and economic resources of natural persons and establishments	Situation in Afghanistan	17 June 2011	1 August 2011	UN
Syria	18 January 2012	Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment, chemicals and other resources (gold, silver, ...)	Repression of the civilian population	1 December 2011	18 January 2012	EU
Guinea-Bissau	3 May 2012	Freezing of assets and economic resources of natural persons	Coup d'etat	12 April 2012	3 May 2012	EU
Myanmar	2 May 2013	Export restriction on military equipment			2 May 2013	EU
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	Annexation Crimea	3 March 2014	5 March 2014	EU
Central African Republic	10 March 2014	Freezing of assets and economic resources of natural persons and establishments	Situation in the Central African Republic	5 December 2013	10 March 2014	UN
Sudan	10 July 2014	Freezing of assets and economic resources of natural persons	Situation in Sudan		10 July 2014	UN

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

**Table 2: Descriptive Statistics**

	Full Sample			Under Sanction			t-test (p-value)
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	
<b>Total Flows (Bn. €)</b>	21,891	6.03	30.20	1,518	0.04	0.32	0.00
<b>Entries (Number)</b>	21,891	126.19	304.99	1,518	12.07	24.01	0.00
<b>Avg. Flow per Entry (Mn. €)</b>	21,151	9.67	35.30	1,203	2.54	29.60	0.00
<b>Declarants (Number)</b>	21,891	61.90	130.53	1,518	8.13	14.79	0.00
<b>Avg. Number of Entries per Declarant</b>	21,891	1.53	0.49	1,518	1.31	0.40	0.06
<b>Asset Classes (Number)</b>	21,891	4.66	2.72	1,518	3.04	1.94	0.00
<b>Avg. Flow per Asset Class per Declarant (Mn. €)</b>	21,891	3.26	26.06	1,518	1.31	25.84	0.00
<b>Inflows (Bn. €)</b>							
– By German Investors	17,028	1.73	6.08	940	0.02	0.13	0.00
– By Foreign Investors	19,698	1.82	13.70	1,109	0.01	0.13	0.00
<b>Outflows (Bn. €)</b>							
– By German Investors	17,028	1.83	6.37	940	0.02	0.11	0.00
– By Foreign Investors	19,698	1.79	11.80	1,109	0.01	0.08	0.00
<b>Assets (Bn. €)</b>							
– Bonds	16,567	3.07	12.60	951	0.04	0.27	0.00
– Commercial Paper	11,032	2.04	7.67	411	0.01	0.02	0.00
– Stocks	16,329	2.64	16.40	834	0.02	0.12	0.00
– Investment Certificate	16,226	0.55	3.81	780	0.01	0.01	0.00
– Equity Capital	9,572	0.25	1.41	310	0.01	0.02	0.00
– Direct Investment Credit	9,541	0.13	0.64	289	0.01	0.02	0.00
– Credit	13,030	0.22	0.95	604	0.01	0.09	0.00
– Other Capital	7,116	0.03	0.22	105	0.01	0.02	0.20
– Coupon	1,959	0.01	0.01	11	0.01	0.01	0.58

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**

	<b>Log Total Flows</b>	<b>Log Inflows</b>	<b>Log Outflows</b>	<b>Log  Net Flows </b>	<b>Log Total Flows</b>	<b>Log Inflows</b>	<b>Log Outflows</b>	<b>Log  Net Flows </b>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Sanctions</b>	-0.715*** (0.098)	-0.724*** (0.104)	-0.702*** (0.087)	-0.663*** (0.105)	-0.628*** (0.128)	-0.656*** (0.170)	-0.745*** (0.126)	-0.685*** (0.242)
<b>Stock Market Capitalization</b>					0.004*** (0.001)	0.004*** (0.001)	0.005*** (0.001)	0.004*** (0.001)
<b>Capital Account Openness</b>					0.855*** (0.203)	1.083*** (0.258)	0.781** (0.233)	0.803*** (0.267)
<b>Public Debt</b>					-0.009*** (0.001)	-0.007*** (0.001)	-0.010*** (0.002)	-0.004** (0.002)
<b>Real GDP Growth</b>					0.923*** (0.112)	0.871*** (0.148)	1.091*** (0.133)	0.715*** (0.146)
<b>Log GDP per Capita</b>					-0.052 (0.039)	-0.010 (0.047)	-0.119*** (0.038)	0.079 (0.059)
<b>Observations</b>	26,280	26,280	26,280	26,280	7,485	7,485	7,485	7,485
<b>Adj. R<sup>2</sup></b>	0.881	0.883	0.878	0.823	0.911	0.883	0.887	0.736

Notes: OLS estimation. 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 2005 through December 2014 in monthly frequency. Time fixed effects and country-specific fixed effects are included but not reported. Robust standard errors 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)
<b>Log Total Value</b>	-0.715*** (0.098)	-0.724*** (0.104)	-0.702*** (0.087)	-0.663*** (0.105)	-0.628*** (0.128)	-0.656*** (0.170)	-0.745*** (0.126)	-0.685*** (0.242)
<b>Log Number of Entries</b>	-0.241*** (0.020)	-0.246*** (0.021)	-0.245*** (0.020)	-0.241*** (0.020)	-0.284*** (0.039)	-0.314*** (0.052)	-0.354*** (0.042)	-0.284*** (0.039)
<b>Log Average Value per Entry</b>	-0.474*** (0.090)	-0.474*** (0.095)	-0.467*** (0.078)	-0.422** (0.099)	-0.343*** (0.116)	-0.372** (0.157)	-0.459*** (0.116)	-0.404* (0.241)
<b>Log Number of Declarants</b>	-0.233*** (0.019)	-0.227*** (0.019)	-0.227*** (0.019)	-0.233*** (0.019)	-0.261*** (0.038)	-0.282*** (0.053)	-0.282*** (0.053)	-0.261*** (0.038)
<b>Log Number of Asset Classes</b>	-0.079*** (0.015)	-0.086*** (0.015)	-0.049*** (0.014)	-0.079*** (0.015)	0.001 (0.022)	0.024 (0.028)	0.039 (0.027)	0.001 (0.022)
<b>Log Avg. Value per Asset Class per Declarant</b>	-0.403*** (0.087)	-0.412*** (0.093)	-0.416*** (0.077)	-0.403*** (0.087)	-0.368*** (0.118)	-0.398*** (0.156)	-0.436*** (0.110)	-0.368*** (0.118)

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 2005 through December 2014 in monthly frequency. Robust standard errors in parentheses. \*\*\*, \*\* and \* denote significant at the 1%, 5% and 10% level, respectively.

**Table 5: The Effect of Sanctions on Cross-Border Capital Flows by Origin of Asset**

	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)
<b>Foreign Assets</b>	-0.358*** (0.079)	-0.279*** (0.083)	-0.169** (0.077)	-0.538*** (0.094)	-0.560*** (0.189)	-0.521** (0.223)	-0.180 (0.173)	-1.159*** (0.319)
<b>German Assets</b>	-0.741*** (0.142)	-0.865*** (0.152)	-0.822*** (0.126)	-0.496*** (0.136)	-0.478** (0.208)	-0.447 (0.343)	-0.750*** (0.277)	-0.224 (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 specified at the top of each column; the sample is listed in the first column. The unit of observation is a country-month pair. Data cover the period from January 2005 through December 2014 in monthly frequency. Robust standard errors in parentheses. \*\*\*, \*\* and \* denote significant at the 1%, 5% and 10% level, respectively.

**Table 6: The Effect of Sanctions on Cross-Border Capital Flows by Asset Class**

	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)
<b>Bonds</b>	-0.500*** (0.125)	-0.536*** (0.142)	-0.739*** (0.130)	-0.662*** (0.140)	-0.430** (0.182)	-0.336 (0.218)	-0.723*** (0.207)	-0.455* (0.249)
<b>Commercial Paper</b>	-0.616*** (0.168)	-0.962*** (0.196)	-0.093 (0.168)	-0.434** (0.191)	-0.816** (0.335)	-1.130*** (0.407)	0.243 (0.335)	-0.684* (0.378)
<b>Stocks</b>	-0.268*** (0.103)	-0.106 (0.109)	-0.301*** (0.110)	-0.277*** (0.104)	-0.039 (0.184)	-0.111 (0.194)	-0.088 (0.192)	-0.133 (0.193)
<b>Investment Certificate</b>	-0.574*** (0.075)	-0.585*** (0.088)	-0.574*** (0.085)	-0.214** (0.094)	-0.360*** (0.123)	-0.401*** (0.154)	-0.473*** (0.141)	-0.088 (0.188)
<b>Equity Capital</b>	-0.666*** (0.168)	-0.685* (0.351)	-0.764*** (0.159)	-0.276* (0.163)	-0.242 (0.319)	0.484 (0.750)	-0.204 (0.296)	-0.300 (0.314)
<b>Direct Investment Credit</b>	0.387** (0.170)	0.316 (0.242)	0.141 (0.203)	0.426** (0.185)	0.115 (0.321)	0.304 (0.431)	-0.508 (0.383)	0.210 (0.332)
<b>Credit</b>	0.524*** (0.166)	-0.001 (0.179)	0.740*** (0.215)	0.315* (0.179)	0.302 (0.238)	-0.373 (0.272)	0.422 (0.297)	-0.044 (0.301)
<b>Other Capital</b>	0.030 (0.641)	0.610 (0.827)	2.035** (0.816)	-0.080 (0.604)	-0.650 (1.011)	-1.683** (0.725)	1.139 (1.313)	-0.340 (1.070)
<b>Coupon</b>	0.136 (0.669)	1.561* (0.860)	-1.714*** (0.453)	0.250 (0.742)	-0.075 (1.024)	0.000 (0.000)	-1.454 (0.909)	-0.151 (1.024)

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 specified at the top of each column; the sample is listed in the first column. The unit of observation is a country-month pair. Data cover the period from January 2005 through December 2014 in monthly frequency. Robust standard errors in parentheses. \*\*\*, \*\* and \* denote significant at the 1%, 5% and 10% level, respectively.

**Table 7: The Effect of Sanctions and Possible Anticipation Effects**

	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)
<b>Sanctions</b>	-0.721*** (0.098)	-0.750*** (0.105)	-0.718*** (0.085)	-0.662*** (0.105)	-0.637*** (0.130)	-0.673*** (0.173)	-0.744*** (0.128)	-0.699*** (0.246)
<b>Pre-Sanctions Period</b>	-0.142 (0.409)	-0.592 (0.372)	-0.376 (0.404)	0.011 (0.400)	-0.254 (0.217)	-0.457** (0.214)	0.026 (0.385)	-0.369 (0.235)

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 2005 through December 2014 in monthly frequency. Robust standard errors in parentheses. \*\*\*, \*\* and \* denote significant at the 1%, 5% and 10% level, respectively.

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

	<b>Log Total Flows</b>	<b>Log Inflows</b>	<b>Log Outflows</b>	<b>Log  Net Flows </b>	<b>Log Total Flows</b>	<b>Log Inflows</b>	<b>Log Outflows</b>	<b>Log  Net Flows </b>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Affected Declarant</b>	0.124*** (0.006)	0.100*** (0.007)	0.104*** (0.007)	0.070*** (0.007)	0.117*** (0.010)	0.103*** (0.012)	0.088*** (0.012)	0.087*** (0.012)
<b>Stock Market Capitalization</b>					0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.001*** (0.000)
<b>Capital Account Openness</b>					0.175*** (0.053)	0.167** (0.065)	0.188*** (0.064)	0.147** (0.059)
<b>Public Debt</b>					-0.005*** (0.001)	-0.004*** (0.001)	-0.006*** (0.000)	-0.005*** (0.000)
<b>Real GDP Growth</b>					0.310*** (0.027)	0.297*** (0.034)	0.361*** (0.032)	0.239*** (0.030)
<b>Log GDP per Capita</b>					-0.117*** (0.014)	-0.086*** (0.018)	-0.097*** (0.016)	-0.082*** (0.015)
<b>Observations</b>	1,316,661	890,580	960,138	1,300,498	685,948	459,181	502,777	677,603
<b>Adj. R<sup>2</sup></b>	0.753	0.749	0.759	0.658	0.766	0.764	0.772	0.671

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 2005 through December 2014 in monthly frequency. Time fixed effects and firm-country-specific fixed effects are included but not reported. Robust standard errors 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**

	<b>Log Total Flows</b>	<b>Log Inflows</b>	<b>Log Outflows</b>	<b>Log  Net Flows </b>	<b>Log Total Flows</b>	<b>Log Inflows</b>	<b>Log Outflows</b>	<b>Log  Net Flows </b>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>EU</b>	-0.146*** (0.030)	-0.039 (0.037)	-0.122*** (0.036)	-0.039 (0.032)	-0.316*** (0.053)	-0.174*** (0.067)	-0.279*** (0.062)	-0.238*** (0.055)
<b>UN</b>	-0.407*** (0.093)	-0.110 (0.107)	-0.319*** (0.111)	-0.298** (0.098)	0.185 (0.281)	-0.098 (0.309)	0.466 (0.322)	0.315 (0.406)
<b>Affected Declarant EU Top5</b>	0.233*** (0.010)	0.206*** (0.011)	0.201*** (0.011)	0.163*** (0.011)	0.225*** (0.014)	0.222*** (0.016)	0.162*** (0.016)	0.184*** (0.016)
<b>Affected Declarant EU Rest</b>	0.151*** (0.009)	0.113*** (0.010)	0.144*** (0.010)	0.084*** (0.010)	0.117*** (0.015)	0.084*** (0.017)	0.119*** (0.016)	0.074*** (0.016)
<b>Affected Declarant UN Top5</b>	-0.091*** (0.017)	-0.073*** (0.019)	-0.094*** (0.019)	-0.075*** (0.020)	-0.283*** (0.033)	-0.268*** (0.036)	-0.303*** (0.036)	-0.215*** (0.038)
<b>Affected Declarant UN Rest</b>	-0.107*** (0.015)	-0.094*** (0.017)	-0.127*** (0.016)	-0.103*** (0.016)	-0.298*** (0.034)	-0.302*** (0.038)	-0.262*** (0.037)	-0.270*** (0.037)
<b>Stock Market Capitalization</b>					0.002*** (0.000)	0.002*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
<b>Capital Account Openness</b>					0.086* (0.050)	0.055 (0.061)	0.118** (0.060)	0.068 (0.055)
<b>Public Debt</b>					-0.005*** (0.001)	-0.004*** (0.001)	-0.007*** (0.001)	-0.005*** (0.001)
<b>Real GDP Growth</b>					0.318*** (0.027)	0.306*** (0.033)	0.366*** (0.032)	0.248*** (0.029)
<b>Log GDP per Capita</b>					-0.121*** (0.014)	-0.092*** (0.018)	-0.099*** (0.016)	-0.086*** (0.015)
<b>Observations</b>	1,354,365	914,586	988,077	1,337,479	707,261	472,459	518,909	698,617
<b>Adj. R<sup>2</sup></b>	0.752	0.749	0.758	0.657	0.766	0.764	0.771	0.670

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 2005 through December 2014 in monthly frequency. Time fixed effects and firm-country-specific fixed effects are included but not reported. Robust standard errors in parentheses. \*\*\*, \*\* and \* denote significant at the 1%, 5% and 10% level, respectively.

**Table 10: The Effects of Sanctions on Cross-Border Capital Flows with Financial Centers**

	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)
<b>Sanctioned Countries</b>	-0.715*** (0.098)	-0.724*** (0.104)	-0.702*** (0.087)	-0.662*** (0.105)	-0.628*** (0.128)	-0.657*** (0.170)	-0.745*** (0.126)	-0.684*** (0.242)
<b>Financial Centers x Sanctions imposed</b>	0.053 (0.040)	0.010 (0.041)	0.027 (0.042)	0.144 (0.090)	-0.005 (0.048)	-0.031 (0.055)	-0.098 (0.058)	0.097 (0.129)

Notes: OLS estimation. The regression specification is similar to the corresponding column in Table 3. Financial centers indicates flows with the United Kingdom, Luxembourg, Switzerland, the United States, Japan, and Singapore in the first six months after the imposition of a sanction. 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 2005 through December 2014 in monthly frequency. Robust standard errors in parentheses. \*\*\*, \*\* and \* denote significant at the 1%, 5% and 10% level, respectively.

**Table 11: The Effects of Sanctions on Net Errors and Omissions in the Balance of Payments**

	<b>Balance</b>	<b>ΔBalance</b>	<b> Balance </b>	<b>Δ Balance </b>
	(1)	(2)	(3)	(4)
<b>Sanctions</b>	2.115 (2.066)	1.185 (3.252)	-0.141 (1.465)	0.896 (2.333)
<b>Observations</b>	120	119	120	119
<b>Adj. R<sup>2</sup></b>	0.449	0.393	0.236	0.200

Notes: OLS estimation. The dependent variable is specified at the top of each column. The unit of observation is the monthly entry in the net errors and omissions category in the German balance of payments. Data cover the period from January 2005 through December 2014 in monthly frequency. Month and year fixed effects are included but not reported. Robust standard errors in parentheses. \*\*\*, \*\* and \* denote significant at the 1%, 5% and 10% level, respectively.

**Table 12: The Effects of EU and UN Sanctions on Cross-Border Capital Flows**

	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)
<b>All Sanctions</b>	-0.562*** (0.117)	-0.568*** (0.126)	-0.737*** (0.101)	-0.541*** (0.133)	-0.624*** (0.133)	-0.651*** (0.176)	-0.748*** (0.130)	-0.699*** (0.252)
<b>UN Sanctions Only</b>	-0.417** (0.203)	-0.424** (0.214)	0.096 (0.182)	-0.330 (0.210)	-0.100 (0.289)	-0.129 (0.274)	0.073 (0.359)	0.354 (0.325)

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 2005 through December 2014 in monthly frequency. Robust standard errors in parentheses. \*\*\*, \*\* and \* denote significant at the 1%, 5% and 10% level, respectively.

**Table 13: The Effects of Financial and Economic Sanctions on Cross-Border Capital Flows**

	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)
<b>Financial Sanctions Only</b>	-0.345*** (0.097)	-0.215* (0.112)	-0.440*** (0.103)	-0.611*** (0.125)	-0.464*** (0.147)	-0.453** (0.205)	-0.626*** (0.138)	-0.699** (0.277)
<b>Financial and Economic Sanctions</b>	-0.931*** (0.142)	-1.020*** (0.149)	-0.854*** (0.121)	-0.693*** (0.148)	-0.983*** (0.225)	-1.099*** (0.274)	-1.002*** (0.243)	-0.655 (0.463)

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 2005 through December 2014 in monthly frequency. Robust standard errors in parentheses. \*\*\*, \*\* and \* denote significant at the 1%, 5% and 10% level, respectively.

**Table 14a: The Effects of Imposing, Strengthening, and Easing of Sanctions on Cross-Border Capital Flows**

	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)
<b>Sanctions</b>	-0.589*** (0.120)	-0.618*** (0.121)	-0.682*** (0.106)	-0.553*** (0.129)	-0.619*** (0.138)	-0.579*** (0.184)	-0.753*** (0.128)	-0.828*** (0.252)
<b>Strengthening</b>	-0.416*** (0.149)	-0.536** (0.152)	-0.146 (0.149)	-0.224 (0.157)	-0.231 (0.302)	-0.660 (0.411)	-0.024 (0.333)	0.502 (0.504)
<b>Easing</b>	0.232** (0.123)	0.512*** (0.136)	0.173 (0.133)	-0.030 (0.134)	0.694* (0.418)	1.144** (0.464)	0.215 (0.599)	0.501 (0.485)

**Table 14b: The Effects of Imposing, Strengthening, and Easing of Sanctions on Cross-Border Capital Flows**

	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)
<b>Sanctions Index</b>	-0.640*** (0.105)	-0.570*** (0.108)	-0.725*** (0.093)	-0.618*** (0.113)	-0.432*** (0.154)	-0.468** (0.204)	-0.508*** (0.163)	-0.611** (0.263)

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 2005 through December 2014 in monthly frequency. Robust standard errors in parentheses. \*\*\*, \*\* and \* denote significant at the 1%, 5% and 10% level, respectively.

**Table 15: The Effects of Lifting Sanctions on Cross-Border Capital Flows**

	<b>Without Additional Control Variables</b>			
	<b>Log Total Flows</b>	<b>Log Inflows</b>	<b>Log Outflows</b>	<b>Log  Net Flows </b>
	(1)	(2)	(3)	(4)
<b>Sanctions</b>	-0.648*** (0.100)	-0.623*** (0.104)	-0.652*** (0.087)	-0.587*** (0.107)
<b>Sanctions Lifted</b>	1.649*** (0.345)	1.732*** (0.352)	1.417*** (0.346)	1.711*** (0.349)

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 2005 through December 2014 in monthly frequency. Robust standard errors in parentheses. \*\*\*, \*\* and \* denote significant at the 1%, 5% and 10% level, respectively.

**Appendix Table 1: The Effect of Sanctions on Cross-Border Capital Flows**

	<b>Log Total Flows</b>	<b>Log Inflows</b>	<b>Log Outflows</b>	<b>Log  Net Flows </b>	<b>Log Total Flows</b>	<b>Log Inflows</b>	<b>Log Outflows</b>	<b>Log  Net Flows </b>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Sanctions</b>	-0.694*** (0.098)	-0.663*** (0.112)	-0.793*** (0.097)	-0.633*** (0.113)	-0.620*** (0.128)	-0.686*** (0.166)	-0.753*** (0.123)	-0.684*** (0.242)
<b>Stock Market Capitalization</b>					0.004*** (0.001)	0.003*** (0.001)	0.004*** (0.001)	0.004*** (0.001)
<b>Capital Account Openness</b>					0.849*** (0.203)	0.802*** (0.208)	0.705** (0.203)	0.766*** (0.266)
<b>Public Debt</b>					-0.009*** (0.001)	-0.009*** (0.001)	-0.012*** (0.001)	-0.004** (0.002)
<b>Real GDP Growth</b>					0.909*** (0.112)	0.782*** (0.139)	1.122*** (0.128)	0.689*** (0.145)
<b>Log GDP per Capita</b>					-0.050 (0.039)	-0.026 (0.046)	-0.130*** (0.037)	0.081 (0.059)
<b>Observations</b>	21,151	19,640	19,902	21,054	7,482	7,378	7,387	7,475
<b>Adj. R<sup>2</sup></b>	0.889	0.877	0.880	0.781	0.915	0.894	0.904	0.737

Notes: This table is an analogue to Table 3, but drops country-month pairs for which no capital flows are recorded. OLS estimation. 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 2005 through December 2014 in monthly frequency. Time fixed effects and country-specific fixed effects are included but not reported. Robust standard errors in parentheses. \*\*\*, \*\* and \* denote significant at the 1%, 5% and 10% level, respectively.

**Appendix Table 2: The Effect of Sanctions on Cross-Border Capital Flows by Type of Sanction Measures Taken**

	<b>Log Total Flows</b>	<b>Log Inflows</b>	<b>Log Outflows</b>	<b>Log  Net Flows </b>
	(1)	(2)	(3)	(4)
Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment	-0.985*** (0.282)	-1.385*** (0.383)	-0.816*** (0.288)	-0.492* (0.268)
Freezing of assets and economic resources of natural persons and establishments	-0.071 (0.222)	0.094 (0.255)	0.208 (0.254)	-0.385* (0.234)
Export restriction on goods related to nuclear technology	-1.314*** (0.358)	-1.668*** (0.423)	-1.139*** (0.396)	-1.288*** (0.419)
Freezing of assets and economic resources	0.262 (0.226)	0.606** (0.276)	0.029 (0.238)	-0.187 (0.364)
Freezing of assets and economic resources of natural persons and establishments; export restriction on luxury goods and goods related to nuclear technology	-1.697** (0.701)	-1.580** (0.683)	-0.502 (0.527)	-1.640** (0.705)
Freezing of assets and economic resources of natural persons	-0.498*** (0.103)	-0.418*** (0.118)	-0.741*** (0.098)	-0.707*** (0.151)
Freezing of assets and economic resources of natural persons; export restriction on military equipment	-0.460 (0.393)	-0.375 (0.342)	-0.630** (0.307)	-0.707*** (0.151)
Freezing of assets and economic resources; export restriction on military equipment	-1.178*** (0.330)	-1.038*** (0.248)	-0.766** (0.295)	-1.006*** (0.312)
Freezing of assets and economic resources of natural persons and establishments; export restriction on military equipment, chemicals and other resources (gold, silver, ...)	-1.525*** (0.138)	-1.675*** (0.143)	-1.502*** (0.159)	-1.244*** (0.227)
Export restriction on military equipment	1.817* (0.985)	2.119** (0.973)	0.213 (0.686)	1.979** (0.945)
Freezing of assets and economic resources of natural persons and establishments; export restriction on oil drilling machinery, chemicals and other natural	-0.125 (0.140)	-0.122 (0.166)	-0.205 (0.136)	-0.072 (0.348)

resources				
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Notes: OLS estimation. Each cell contains the coefficient from a separate regression; the regression specification is similar to the corresponding column in Table 3, without additional control variables (because of missing data). The dependent variable is specified at the top of each column; the sample is listed in the first column. The unit of observation is a country-month pair. Data cover the period from January 2005 through December 2014 in monthly frequency. Robust standard errors in parentheses. \*\*\*, \*\* and \* denote significant at the 1%, 5% and 10% level, respectively.