Capital Flight to Germany: Two Alternative Measures

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ABSTRACT

We analyze the determinants of two measures of capital flight for Germany. One measure is based on the concept of trade misinvoicing and one on net claims and liabilities in the Eurosystem of central banks. For both measures, we propose refinements to enhance the assessment of capital flight. We find that capital flight towards Germany has been quite sizable in the recent decade, summing up to about 2% of GDP annually. Regarding the determinants, our results suggest that the two measures of capital flight are driven by both common and measure-specific factors. Traditional determinants such as covered interest differentials only play a limited role, while crisis-specific factors such as policy uncertainty, the ECB collateral policy, as well as currency misalignment are driving factors of the investors' apparent flight-to-safety behavior.

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1. Introduction

Germany's ballooning current account surplus experienced after the 2007/8 global financial crisis (Figure 1) has been widely discussed from a trade and fiscal policy perspective.[1] As Germany does not accumulate official reserves via current account surpluses, a net outflow of goods and services implies a substantial corresponding private capital outflow. A parallel movement, however, which has received much less attention, appears to go in the opposite direction: There exists substantial capital flight towards Germany via either illicit capital flows, or flows which have been facilitated by other reserve-like operations of national central banks in the Eurosystem.

German assets are generally considered to be "safe assets", especially as the country stands out in terms of its relatively strong fundamentals compared to other countries in the euro area.[2] Private households in countries affected by the euro crisis may, for instance, be concerned about domestic policies and move their deposits to Germany. Banks that have lent large amounts of money to the euro area periphery have repatriated their funds for safer alternative investments, and owners of governments bonds are seeking to reshuffle their portfolios to minimize the associated default risks. Importantly for our paper, all of these transactions are examples of capital movement without a corresponding trade transaction in goods or services that is in the focus of the debate centering on the identity of the financial and current account.

These net capital movements are reflected in Germany's large creditor position in the TARGET2 clearing system and are partly a by-product of the European Central Bank's (ECB's) decentralized implementation of monetary policy and the corresponding asymmetric liquidity provision across national central banks (NCB). With the introduction of the ECB's full allotment policy, the refinancing operations support a swap of eligible collateral items in crisis-prone countries into assets in safe-haven countries; see Garber (1999, 2010), Sinn and Wollmershäuser (2012), Cecchetti *et al.* (2012), Reinhart (2016) and Steiner *et al.* (2017). Practitioners have been using this indicator to identify capital flight within Europe, in particular when analyzing the recent capital outflows from Italy and Spain.[3] At the time of writing, Germany's TARGET2 position amounts to about 30% of GDP and is thus on an order of magnitude comparable to China's holding of international reserves, that is about 28% of GDP.

An astute reader may question the relevance of studying *illicit* capital flight to Germany, which has in principle an open financial account. The potential economic and quantitative importance of illicit capital flight to Germany, however, is illustrated by anecdotal evidence presented in some studies on illicit economic activities. Medina and Schneider (2018), for instance, estimate the size of Germany's shadow economy to be 12%. The magnitude is slightly below the 14% estimated for China, which is widely considered to be a country with considerable illicit capital inflows and outflows.[4]

The recent police raids at Deutsche Bank attest the seriousness of illicit capital flows to Germany.[5] The German business newspaper Handelsblatt coined Germany the "Gangsters Paradise"

[1] See, for example, Felbermayr *et al.* (2017) and Kollmann *et al.* (2015), and references therein.

[2] See, for instance, He, Krishnamurthy and Milbradt (2019) as well as articles in the press, such as "Capital Flight Leaves Banks in Germany Awash in Deposits," Bloomberg, 8 June 2012, and "Investors rush for the safety of German Bunds," Financial Times, 23 May 2012.

[3] See, for instance, "Capital flight from Italy surges, pushing TARGET2 imbalances to danger level", The Telegraph, 07 June 2018; "The euro zone crisis - capital flight.", The Economist (Buttonwood's notebook), 21 May 2012. Cecioni and Ferrero (2012) dissect changes in TARGET2 during the early crisis period and confirm its movement to be mostly related to capital flight. In contrast, Auer (2014) finds both, current account financing and capital flight, to play a role.

[4] See for instance Beja and Edsel (2008), Ferrantino et. al (2012), Kar and Freitas (2012) and Cheung et. al (2016).

[5] See "Deutsche Bank Raided in Laundering Probe Going Into 2018", Bloomberg, Business, November 29, 2018.

in an article entitled "How Germany became the stronghold for Money Laundry."[6] The newspaper report is more than an isolated instance. The "Financial Action Task Force (FATF)," a joint initiative of the OECD and the IMF, has repeatedly criticized Germany for its lenient stance on controlling illicit capital inflows.[7]

For devising initiatives and policies to curb capital flight to Germany, it is important to understand the mechanisms and determinants of these capital movements. In this paper, we aim to accomplish three goals. First, we derive two proxies to measure the unobserved capital flight and study their properties. Second, we analyze the institutional setting that gives rise to net capital inflows despite an open financial account and highlight the similarity to well-known balance of payments crises, such as the Latin American Crisis in 1995 or the Asian Crisis in 1997. Finally, we investigate the determinants of capital flight. In addition to the canonical determinants that include covered interest differentials, macroeconomic factors, and monetary policies, we distinguish between factors pertaining to Europe and those to the rest the world. We further consider several uncertainty measures to assess the flight-to-safety motivation.

Our proxy measures of capital flight are: (1) a trade-cost adjusted measure of trade misinvoicing (TMI), and (2) a private euro area capital flight (PEAF) measure defined by the current-account-adjusted changes in net claims and liabilities arising from open positions in the Eurosystem's clearing system, TARGET2. These measures capture capital flight activities that are triggered by different motivations and considerations. For instance, we anticipate that illicit flows via TMI are likely to be associated with trade intensity and long-term economic conditions. Capital flight in the form of PEAF, on the other hand, is legal and mostly financial in nature. Transactions under PEAF are reminiscent of swap-line operations among central banks, but regionally limited to the euro area. They might be facilitated by an implicit subsidy arising from the ECB's collateral policy (as documented in Drechsler *et al.*, 2016).

Empirically, we find that classical variables from the capital flight literature, in particular the covered interest differential of Germany vis-à-vis the United States, have only little impact on either measure of capital flight. The CID is statistically insignificant in a multivariate regression that accounts for other factors. Among fundamental drivers, the TMI measure responds to currency misalignment, exchange rate uncertainty, and the import duties ratio. An overvalued or volatile exchange rate has a dampening effect on capital inflows, while high import duties appear to make it attractive to circumvent these fees through misinvoicing.

Our PEAF measure responds significantly to currency misalignment with the expected sign, as well as to government debt and the interest rate spread of government bond yields, which is consistent with the flight-to-safety motivation discussed above. Furthermore, we find that collateral standards, both for the common collateral framework of the Eurosystem, as well as the introduction of country-specific collateral items have influenced intra-euro area capital flight. A loosening of collateral standards drives capital into Germany, while a tightening has the opposite effect.

A particular focus of our paper is on policy uncertainty that surrounds events of the euro crisis. Standard variables, such as monetary aggregates, as well as the debt- or deficit-to-GDP ratios are likely to capture the monetary and fiscal policy stance only partly around crisis periods. To capture a more general sense of uncertainty, we make use of newly-developed measures of economic policy uncertainty resting on the methodology by Baker *et al.* (2016).

Our results show that European Union (EU) economic policy uncertainty has been an important determinant of intra-euro area capital flight, while it appears to have played no visible role for TMI. Among the euro area countries, economic uncertainty in Greece, in particular, is statistically significant in the PEAF regression. When further decomposing the sources of policy uncertainty, we find that uncertainty about the banking sector policies and future currency policy are key factors. The use of an interaction dummy approach indicates that these factors become relevant after the debate of

[6] See "Gangster's Paradise – wie Deutschland zur Hochburg für Geldwäscher wurde", Handelsblatt, July 25 2018. It highlights the rising number of convictions, which may only be a small part of the actual cases. A particular focus is on the real estate sector, where two institutional aspects play a role: (i) not all transactions are documented by an official notary, and (ii) the burden of proof is on the authorities. The practice is in contrast to that of, for example, Italy that requires buyers and sellers to prove the source of the money is legal.

[7] See, for example, Financial Action Task Force (2010, 2014).

private sector involvement (PSI), which had first been discussed at a meeting of the heads of state at the Deauville summit on 19 October 2010.

We perform a range of robustness checks to further analyze these findings. First, we experiment with different measures of TMI. We compare our baseline regression to the use of alternative ways to account for the costs of insurance and freight, which are typically used in the literature but rely on much stronger assumptions. Our results indicate that not taking into account the time- and country-variation of these transaction costs may hinder the precise inference of TMI determinants. We also check whether our results may be affected by poor data quality by truncating countries from the sample which score in the bottom 25%- or 50%-percentile of the World Bank's statistical capacity index. Finally, we employ different estimation methods. These include dynamic specifications, seemingly unrelated regressions, IV regressions with lagged values as instruments and various structural break-tests. Overall, the reported findings stay remarkably robust across these alternative specifications.

2. Measures of Capital Flight

As there is little agreement on the exact definition of capital flight and its measurement,[8] we consider two conceptually different measures; capturing different types and motives of capital flight.

2.1 Trade Misinvoicing (TMI)

Our first measure is trade misinvoicing (TMI). In principle, each country's exports (and imports) are reported twice: by the country itself and by its trading partners. It is well-known, however, that often sizable differences between these mirror statistics can be observed. These differences, beyond differing reporting practices, are frequently attributed to intentional misinvoicing of international goods (Bhagwati, 1981, 1964; Cardoso and Dornbusch, 1989).[9] An economic agent can, for instance, either underinvoice its exports or overinvoice its imports to move capital out of the country. Consequently, we calculate trade misinvoicing as the sum of export underinvoicing (EUI) and import overinvoicing (IOI); that is, *TMI = EUI + IOI*. Export underinvoicing and import overinvoicing are defined as

$$EUI = \Sigma_i^p \, [XW_{i,t} - XC_{i,t}*(1+CIF_{i,j,t})], \tag{1}$$

and

$$IOI = \Sigma_i^q \, [MC_{i,t} - MW_{i,t}*(1+CIF_{i,j,t})], \tag{2}$$

where, at time t, $XW_{i,t}$ is country *i*'s reported value of imports from Germany, $XC_{i,t}$ is Germany's reported value of exports to country *i*, *p* is the number of countries importing from Germany, $MC_{i,t}$ is Germany's reported value of imports from country *i*, $MW_{i,t}$ is country *i*'s reported value of exports to Germany, and *q* is the number of countries exported to Germany. Either a positive *EUI* or *IOI* implies (illicit) capital flows out of Germany. Note that, while export values are reported free on board (FOB), import values are commonly reported including the costs of insurance, freight, …, etc. (CIF). The variable $CIF_{i,j,t}$ accounts for this wedge and is thus crucial for a precise estimation of trade misinvoicing. The time and country-variation of the CIF, however, has largely been ignored by the empirical literature on trade misinvoicing.

Exploiting a new dataset by the OECD (International Transport and Insurance Costs of Merchandise Trade – ITIC) we infer and back out the CIF estimate that accounts for differences between trading partners, product types and periods.[10] For a given year *t*, the country-pair *CIF* is a weighted average of the product-specific *CIF* with weights given by trade-volume values of individual products,

[8] See, among others, Claessens and Naude (1993); Kant (1996); Kar and Cartwright-Smith (2009); Schneider (2003).

[9] We do not take a stance on which country's agents report the true economic value and which one's mis-invoice.

[10] A small subset of countries reports their imports in both, CIF and FOB. This allows the OECD to estimate the missing values from a gravity-type equation model (Miao and Fortanier, 2017).

$$CIF_{i,j,t} = \sum_{g=1}^{m} \widehat{CIF}_{i,j,t,g} \frac{v_{t,i,g}}{\frac{1}{m}\sum_{g=1}^{m} v_{t,i,g}}, \quad (3)$$

where $\widehat{CIF}_{i,j,t,g}$ is the product- and country-pair-specific *CIF* estimate at time t from the OECD dataset, $i = [1, \dots, p]$ and j= $[1, \dots, p]$ are the partner and trading-partner country indices, respectively. v is the trade volume and $g = [1, \dots, m]$ the index of different OECD HS-92 product categories.

Other papers analyzing trade misinvoicing either explicitly or implicitly assume $CIF_{i,j,t} = 10\%, \forall i, j, t$.[11] The assumption does not match the empirical reality in several ways. First, Germany's freight costs are on average very likely to be considerably lower.[12] Second, freights costs are likely to vary over time (Hummels, 2007; Jacks *et al.*, 2008). Third, the actual value of CIF can depend on which is the exporting and which one the importing country (Wei *et al.* 2018). Fourth, CIF varies with the geographical distance between countries. Based on a standard gravity model, trade volumes and freight costs are inversely related to the distance between countries. Not taking this into account can systematically bias trade misinvoicing estimates.

The literature usually takes a capital outflow perspective and considers trade misinvoicing to be related to the evasion of taxes and tariffs, the circumvention of capital controls, flight from economic risks in the home country (e.g. expansionary fiscal or monetary policies), search for political stability, yield-seeking and arbitrage motives, the avoidance of being exposed to exchange rate volatility or the speculation on its adjustment to its equilibrium value.[13]

2.2 Private Euro Area Capital Flight (PEAF)

Our second measure captures private capital flight within the euro area via the TARGET2 clearing system. It is reminiscent of the capital flight typically analyzed in the literature on balance of payments crises. Sachs, Tornell and Velasco (1996), for instance, describe this mechanism for the well-known case of Mexico. In Mexico 1994/5, the central bank provided credit to the domestic economy by buying assets and lending to banks. This liquidity was used by investors to convert Peso-investments into US-dollar investments at the central bank guaranteed fixed exchange rate of about 3:1. This capital flight was essentially a flight from risky assets (Mexican governments bonds) into safe assets (US Treasury bills). The expansionary policy stance of the central bank of Mexico facilitated this process.

Similarly, in Europe, investors have been taking advantage of the expansionary policy stance of the ECB. In the Eurosystem, investors can pledge, for instance, Italian government bonds as collateral to the Banca d'Italia, the central bank of Italy, and used the central bank money to buy safe assets in Germany. The net capital outflows from Italy to Germany are then recorded as a TARGET2-liability of Banca d'Italia and a TARGET2-claim of the Deutsche Bundesbank. Indeed, financial market observers use TARGET2 as one of the key indicators to monitor the intensity of intra-euro area capital flight[14].

While changes in TARGET2-balances are often interpreted as a measure of capital flight within the euro area, the TARGET2 clearing system also includes capital flows by official institutions (e.g. the German government's payments into the European Stability Mechanism), capital flows accommodating current account imbalances and outright transfers, like development assistance. We,

[11] See, for example, Beja (2008), Buehn and Eichler (2011), Patnaik *et al.* (2012), Kar and Freitas (2012). The CIF = 10% assumption is usually justified by an older estimate of the IMF. The International Monetary Fund (2015), for instance, argues "the 10 percent c.i.f./f.o.b. factor represents a simplified estimate of these costs, which vary widely across countries and transactions".

[12] OECD (2018), for example, cites official national sources on the German cif-fob margin to have been 2.3% in 2014 over all products and partner countries.

[13] See, for example, Cheung *et al.* 920160, Buehn and Eichler (2011), Kellenberg and Levinson (2019), Patnaik *et al. (*2012), and Worku *et al. (*2016).

[14] Floyd Norris, New York times, May 31, 2012 wrote: „The Institute of Empirical Economic Research at the University of Osnabrück in Germany compiles the numbers on a web-site [www.eurocrisismonitor.com]. Some economists are waiting nervously to see if the numbers spiraled upwards in May".

thus, account for these activities, and adjust the negative change in Germany's TARGET2-claims (*T2*) to obtain our second measure of capital flight:

$$PEAF = -(\Delta T2) + CA^{EA} + CAP^{EA} + FA^{EA,Gov}, \quad (4)$$

where CA^{EA} and CAP^{EA} are Germany's current account and capital account balances vis-à-vis the other member countries of the European Monetary Union, respectively, and $FA^{EA,Gov}$ are intra-euro area financial transactions of the German government.

There is very little research on the economic determinants of intra-euro area capital flight. The literature instead focuses on the empirical disentanglement of accounting identities of the TARGET2 balance, which has first been derived by Sinn and Wollmershäuser (2012).[15] Our measure is inspired by their decomposition of TARGET2 balances into current account and financial account components. We additionally subtract the official flows to obtain our PEAF measure.

There are also some papers exploring the economic factors underlying the build-up of TARGET2 balances. Cecchetti *et al.* (2012) consider redenomination risk to be an important driver. De Grauwe and Ji (2012), after controlling for fundamental variables of country risk (i.e. government debt, the real effective exchange rate, and real economic growth), interpret the correlation between TARGET2 and government bond spreads as evidence for speculative panic and flight-to-safety. Whelan (2014) further discusses the positive link between central bank refinancing operations and the build-up of TARGET2 balances.[16] None of the papers, however, considers an adjusted TARGET2 measure that isolates the private capital flight component from the current account-financing and public financing component, as in our PEAF measure.

3. Preliminary Analysis

The pattern and size of each measure of capital flight is displayed in Figure 2. We find that, during our (maximum) sample period, 1995Q1 to 2018Q3, capital flight to Germany has been rising and is economically not negligible after the 2007/8 global financial crisis; according to TMI it averages to about 1.48% of GDP annually, whereas PEAF was 0.56% on average. Given the size of the German economy, the capital flight has accumulated to almost 600 billion euros over the past decade, or 70% of today's GDP. It is also interesting to consider the sum of the measures over time. After 2008, both measures add up to 2.04% of GDP; but before 2008, the sum is quite close to zero (~0.05‰). If the measures represent different facets or components of capital flight, their sum suggests that the sizable net capital flight to Germany is a rather recent phenomenon.

The two capital flight measures capture net capital movements towards Germany under the covers of trade and financial transactions; these flows are likely to be committed by different clienteles with non-identical motivations. Indeed, TMI and PEAF have a correlation coefficient of 0.265; indicating that they are related but also have their own unique dynamic features.

In order to correctly specify the regressions in the subsequent analysis, we first test for stochastic trends in our capital flight measures. Table 1 reports unit root tests. At the 5% level of statistical significance, we can reject the hypothesis of a unit root for both variables, over different sample periods and using different test statistics.[17] Consequently, we treat our variables as *I(0)* in the following regression exercise.

4. Regression Analysis

4.1 Baseline Specification

As a starting point, we consider the following specifications for TMI and PEAF:

$$Y_{t,TMI} = \alpha + \lambda' CID_t + \theta' X_t + \delta' M_t + \beta' W_t + \varepsilon_t, \quad (5a)$$

[15] The dispute centered on the question to what extent TARGET2 balances reflect current account financing or capital flight. Indeed, it reflected both – but to a different extent over time and across countries (Sinn and Wollmershäuser, 2012; Auer, 2012; Cecioni and Ferrero, 2012).

[16] Westermann (2014), for example, critically reviews this article.

[17] Cross-checking the result with the KPSS stationarity test confirms the I(0) finding – the two measures do not reject the null hypothesis of stationarity.

and

$$Y_{t,PEAF} = \alpha + \lambda' CID_t + \theta' X_t + \delta' M_t + \beta' Z_t + \varepsilon_t, \quad (5b)$$

where $Y_{t,TMI}$ and $Y_{t,PEAF}$ are, respectively, the TMI and PEAF capital flight measure normalized by GDP. The explanatory variable CID_t is the deviation from the covered interest parity between the euro and US-dollar. Arguably, CID is the most commonly used factor to explain capital flight (Cuddington, 1986; Diwan, 1989; Dornbusch, 1984). The use of the EUR-USD covered interest differential captures the decision by a third country to move the capital to the US or Germany. The interest differential between Germany and other EU economies is considered later in (5b). Note that previous studies are mostly on capital flight of developing economies.[18] Germany – a developed economy imposing limited capital controls – typically displays quite small covered interest differentials (Figure 3), and the CID effect can be small especially taking transaction costs into consideration. Nevertheless, given its prevalence in literature, we include this variable in our analysis. It is defined such that positive values indicate arbitrage opportunities by investing in Germany; we therefore expect it to have a negative (or zero) coefficient.

The vector X_t includes the economic determinants that are deemed common to both TMI and PEAF and capture investors' motives to avoid country risk (government debt, fiscal balance, real GDP growth), currency debasement (inflation differential, currency misalignment), volatile investments (stock price volatility), and to minimize taxation (tax ratio). We expect Germany to experience more inflows/less outflows when debts, deficits, volatility and taxes are low, the exchange rate is undervalued (positive coefficient) and economic growth is high (negative coefficient).

The vector M_t includes M1 and M3 money growth rates that are considered in recent studies on capital flight. The relative monetary growth is indicative of the relative policy stance of Germany and the US and affects the capital flow pattern. Recent studies consider the money stock can be a measure of the intensity of the 'internal drain' and a proxy for potential capital flight (e.g. De Beaufort Wijnholds and Kapteyn, 2001; Cheung *et al.*, 2016; Obstfeld *et al.*, 2009).[19]

To capture the different natures of the two capital flight measures, we further include in (5a) W_t that captures economic determinants that are specific for TMI, and in (5b) Z_t that captures determinants specific to PEAF. Specifically, W_t includes exchange rate volatility, the import duty ratio, the size of the shadow economy, and *de facto* trade openness.[20] Capital inflows via TMI are hypothesized to respond negatively to a high degree of exchange rate uncertainty as measured by its realized volatility (positive coefficients). To circumvent tariffs and import VAT, firms have an incentive to underreport the true value of imports. This suggests a positive relationship between our import duty variable and capital outflows (negative coefficient). The signs of the coefficients on the shadow economy and trade openness do not come with a strong prior. On the one hand, shadow economy activities may generate black money cash which increases the demand for cross-border money laundering. On the other hand, an active shadow economy may open up consumption opportunities for illicit inflows. *De facto* trade openness (proxied by the trade volume normalized by GDP) may also have opposing effects on TMI. While a higher trade volume (for given import duties) may be a proxy for the reduction of non-tariff trade barriers, thus lowering the incentives to underinvoice imports, a higher transaction volume may also open up more possibilities to misinvoice.

Z_t includes changes in the interest spread of European countries affected by the euro crisis against Germany, Google searches for "euro breakup" as a proxy of redenomination risk, and variables capturing increased flexibility in the Eurosystem's collateral standards. We expect all of these variables to enter the regression with a negative coefficient. The interest rate spread aims to test the "financial panic" hypothesis put forward by De Grauwe and Ji (2012) and is expected to be positively correlated with capital inflows. In contrast to global capital flows via trade misinvoicing,

[18] Alesina and Tabellini, 1989; Bhagwati *et al*., 1974; Boyce and Ndikumana, 2001; Cerra *et al*., 2008; Collier *et al*., 2001; Cuddington, 1987; Epstein, 2005; Fedderke and Liu, 2002; Lensink *et al.*, 1998, 2000; Le and Zak, 2006; Mikkelsen, 1991, and others. An exception is Javorcik and Narciso (2008) who focuses on tariff evasion via trade misinvoicing between Germany and its trade partners.

[19] The monetary aggregate may be indirectly related to QE policies of the FED and the ECB. There is however no direct relationship as M0 is only a small component of M2 and M3.

[20] The choice of TMI-specific variables is inspired, among others, by Cheung *et al*., 2016; Buehn and Eichler, 2011; Kellenberg and Levinson, 2019; Patnaik *et al*., 2012; Worku et al., 2016.

capital flows within the euro area are unlikely to be influenced by misalignment or volatility of the common currency. PEAF may, however, be affected by a noticeable increase in the perceived breakup-probability, and subsequent redenomination, in the height of the euro crisis (Cecchetti *et al.*, 2012).[21] Furthermore, lower collateral standards in refinancing operations facilitate the creation of central bank money; risky governments bonds can be pledged to the national central bank and the resulting liquidity can either be moved to Germany in the form of deposits or invested into other safe assets, such as bunds.

4.2 Empirical Results

4.2.1. Determinants of Trade Misinvoicing

Table 2 reports the results of estimating variants of (5a). The CID variable is insignificant either as a standalone explanatory variable or in the presence of other variables. The finding is in contrast to the literature, which typically finds the CID to be a key determinant for capital flight. While the motive of earning arbitrage profits is deemed to be a prominent determinant of capital flight of developing economies, it does not appear to be a strong motivation to move capital to Germany. The insignificant result may not be surprising if we are talking about capital flight to Germany, which has an already quite open financial account and developed financial sector. We nevertheless keep the CID variable in the following analyses due to its prominence in the academic literature.

For the economic determinants included in the vector X_t, the real GDP growth, inflation differential, exchange rate misalignment, and government debt variables are statistically significant with the expected signs (Column 2, Table 2). Specifically, capital flight via TMI to Germany increases with higher German real GDP growth, lower relative German inflation, an undervalued currency, and lower German government debt. The other fundamental variables used in the literature including the government balance relative to GDP, the tax ratio and stock market volatility are statistically insignificant.

Between the two money growth variables, only the relative M1 growth rate variable is significantly positive; that is, a relatively loose German monetary policy reduces flight to Germany (Column 3). The monetary effect, however, as indicated in the sequent results, is not robust to the presence of other determinants.[22]

Among the factors in W_t that are deemed to be specifically relevant to TMI, only the openness variable is statistically insignificant (Column 4). The results indicate that a) exchange rate volatility capturing currency uncertainty deters capital flight, and b) the import duty ratio facilitates illicit inflows as higher import duties make it attractive for importers to incorrectly declare the values of imports. Both findings confirm the results of earlier research.[23] Furthermore, we find that the estimated size of the shadow economy is inversely related to illicit inflows. When these potential determinants are included simultaneously (Column 5), most of the variables become insignificant; a result that is likely driven by either correlation of the variables or inclusion of irrelevant variables. Column (6) presents the results of sequentially dropping the "most" insignificant variable from the regression; that is, those with the lowest t-statistic. The resulting parsimonious specification shows that both monetary and shadow economy effects reported under Columns (3) and (4) are not robust in the presence of other economic determinants. The parsimonious specification explains over half (57%) of the variations in TMI, the six significant determinants have their expected signs.

4.2.2. Determinants of Private Euro Area Capital Flight

The results of estimating the baseline specification of PEAF (5b) are presented in Table 3. Comparing the explanatory variables that are common to (5a) and (5b), the PEAF capital flight measure is only significantly affected by a few. The CID variable displays a significantly negative

[21] Also, ECB-president Mario Draghi remarked upon the "risk of convertibility" in a speech at the Global Investment Conference in London, 26 July 2012.

[22] These results resemble earlier results of Cheung *et al.* (2016) for China.

[23] See, for example, Patnaik *et al.* (2012), Cheung *et al*. (2016), Javorcik and Narciso (2008), Mishra *et al*. (2008), Ferrantino *et al.* (2012), and Fismann and Wei, (2004).

effect as a standalone regressor or when it is paired up with monetary factors (Columns 1 and 3). However, the effect is not robust to the inclusion of other control variables.[24]

Of the four variables in Z_t, the vector that collects factors specific for PEAF, the interest rate spread of the European countries in crisis vis-à-vis Germany matters (EA Spread),[25] as well as collateral standards in refinancing operations of the ECB. The two other variables are insignificant. It is worth noting that these two significant PEAF-specific factors explain 38% of data variability – a level of explanatory power that is much higher than those offered by CID, canonical economic and monetary variables.

The interest rate spread has a negative sign, which at first sight appears surprising. A lower interest rate in Germany vis-à-vis other European countries thus drives capital into Germany, rather than out of Germany. This is puzzling when applying the same arbitrage motivation as when interpreting the CID coefficient. Note, however, that while the CID variable used a very short-term money-market interest rate, the interest rate spread in Table 3 is computed as the difference in 10-year government bond yields. Indeed, the spread is usually viewed as a barometer of perceived country-risk differences within the euro area. After a phase of decoupling between fundamentals and interest rates, investors started to again notice that Germany and other European countries, with weaker fundamentals, do not share the same risk category. The negative coefficient is thus in line with the partial correlation between TARGET2 and the interest rate spread found by De Grauwe and Ji (2012); higher default risk in other euro area countries drives capital into Germany, rather than in the other direction.[26] Note that, due to the countervailing effects, the size of the coefficient represents a lower-bound estimate.

The findings on collateral standards are in line with the institutional background characteristics of ECB monetary operations. NCBs in the euro area lend to banks against eligible collateral. Part of this collateral is determined by the ECB council, and (a smaller) part has been determined by the NCBs (idiosyncratic component). Some NCBs, for instance, adopted special collateral items after the peak of the crisis in 2011, including ELA – the ECB's emergency liquidity assistance facility. Our regression findings imply that whenever these collateral standards were loosened, part of the liquidity created has been used for capital flight; when they were tightened (for instance in mid-2011), the intra-euro area capital flight is discouraged (see, e.g., Sinn and Wollmershäuser 2012; Whelan, 2014; Westermann, 2014).

In deriving the parsimonious specification from all these potential factors, we found that, in addition to three PEAF-specific factors, two economic variables; namely the currency misalignment and government debt variables are statistically significant. While these two economic variables are insignificant under Column (2), they are significant with the expected signs in the presence of, say, PEAF-specific factors; indicating a certain degree of complementarity between these variables. Overall, the PEAF measure of German capital flight is explained by both, fundamental, as well as measure-specific factors. Taken together, these variables account for 43% of the PEAF variability.

4.3 The Role of Economic Policy Uncertainty

While fundamental data on policy variables, in particular monetary and fiscal policy, are included in our specification, they may not represent all aspects of global or regional uncertainty that drive flight-to-safety.[27] For instance, inflation has been quite stable in the past, but central banks around the world have taken a policy stance that makes the path of future inflation very uncertain. The same applies to fiscal policies, where the effects of the debt-brake for instance – although part of the

[24] When including the CID's subcomponents (i.e. the short-term interest rate differential and the forward premium), they also turn out to be statistically insignificant in the multivariate specifications of both, the TMI and PEAF measure. The results are not reported but are available upon request.

[25] Ireland, Italy, Portugal, and Spain. Greece is excluded due to low liquidity of its debt securities as well as any convoluting effects from the Greek debt restructuring of 2012. Results are robust to the inclusion of Greece, and are available upon request.

[26] The apparently counterintuitive sign has first been found and discussed in Cuddington (1987) for a set of emerging market economies.

[27] See Le and Zak (2006) for a portfolio-choice-model argument.

constitution in all euro area countries – were quite unpredictable. In this subsection, we consider alternative measures of economic policy uncertainty (EPU) in our analysis:

$$Y_{t,TMI} = \alpha + \lambda' CID_t + \theta' X_t + \delta' M_t + \beta' W_t + \gamma' U_t + \varepsilon_t, \quad (6a)$$

and

$$Y_{t,PEAF} = \alpha + \lambda' CID_t + \theta' X_t + \delta' M_t + \beta' Z_t + \gamma' U_t + \varepsilon_t, \quad (6b)$$

where the vector U_t captures the EPU related variables and the other covariate vectors are limited to only include the subset of statistically significant variables derived in the previous section. These EPU related variables are meant to represent uncertainty not captured by variables such as stock market volatility, interest rate spread, and exchange rate volatility considered in the previous subsection.

The measures follow a newly-developed methodology of Baker, Bloom, and Davis (2016) and rely on the relative frequency count of words of uncertainty and economic policy in either newspapers or expert reports of the Economist Intelligence Unit (Ahir, Bloom and Furceri, 2018). The data appendix provides detailed descriptions of these EPU indices.

As the TMI measure does not respond to any of these policy uncertainty indices, we for brevity do not present here these TMI results, which are available upon request.

For the PEAF variable, we start with the Germany EPU index, the EU EPU index, and a global EPU index (Table 4). While all of them are statistically significant, when included individually, only the EU EPU index remains significant when all are included jointly and survived a stepwise regression. Cl. (1) and Cl. (2) show that both, the news-based and the expert-based index is statistically significant, i.e. higher economic policy uncertainty in the EU facilitates capital flight towards Germany – the safe haven. This result resembles findings by Hermes and Lensink (2001), who also analyze the link between policy uncertainty and capital flight; albeit with a focus on least developed countries and using different measures of capital flight and policy uncertainty.

As the three variables are highly correlated, indicating the presence of a common sentiment component, we extract their 1st principal component and indeed find it to be highly significant. Adding it to the baseline regression derived in section 4.2. yields a negative and statistically significant partial correlation with our PEAF measure as well. This result is consistent with the existence of a general climate of economic sentiment, which either reflects global trends or is not regionally confined due to strong spill-overs from high-uncertainty countries; with the European countries in crisis being likely sources.

To follow up on the question of the sources of uncertainty, we look into some of the subcomponents of the EU EPU variable. Among the potential suspects, we find that policy uncertainty in Greece, in particular, has been driving capital (euro-area wide) into Germany. The other countries also have the expected negative signs but lower coefficients. Also, they are either insignificant (Ireland, Italy, and Portugal) or are only marginally significant at the 10% level (Spain).[28]

Overall, economic policy uncertainty – not picked up by the variables considered in the previous subsection – appears to be a relevant additional factor; the adjusted R^2 estimate of the regression increases from 0.43 to up to 0.48.

Other variables, aimed to capture different aspects of uncertainty, such as a geopolitical risk (measured either by violent conflicts or the geopolitical risk index by Caldara and Iacoviello, 2018), a dummy variable for the Greek private sector involvement (PSI), as well as the Deauville meeting, where the option of a PSI was first discussed, stock market volatility in the US or Europe (captured by the VIX/VSTOXX) have turned out to be statistically insignificant and are not reported above (results are again available upon request).

In the appendix, we further decompose the effect of economic policy uncertainty on intra-euro area capital flight. First, as reported in Table B1, we break down the Greek economic policy uncertainty into its thematic components. We find, for a given level of overall EU policy uncertainty, that some subcomponents of Greek uncertainty are of additional importance. Especially, economic policy uncertainty regarding the banking sector and the currency enters the regression with a negative and statistically significant coefficient. Tax-, debt-, fiscal-, monetary- and pension-related economic uncertainty indices, turn out to be statistically insignificant (or only marginally significant). When

[28] The limitation to the expert-based index in Cl. (5-9) is due to data availability.

going the opposite route and looking at a broader uncertainty index not related to specific policy discussions but rather all types of (perceived) economic uncertainty, this variable turns out to be statistically significant with a negative sign as well. In sum, the results indicate not only overall EU policy uncertainty fuels capital flight to Germany but also uncertainty surrounding the Greek crisis, in general, and banking and currency uncertainty, in particular.

Finally, in Table B2, we test for potential non-linearities over time. The Deauville meeting, where the possibility of PSI has first been discussed may have changed the way that economic uncertainty measures have influenced capital flight.[29] As Table B2 shows, the interaction term of EPU × PSI is not statistically significant in most regressions. Nevertheless, the Wald-tests suggests that the sum of the coefficients on EPU and EPU × PSI is significant in all cases except Ireland and Portugal, while the EPU variable in the same regression by itself is not. This suggests that economic policy uncertainty is indeed a factor that has become relevant after the beginning of private sector involvement, which is analogous to a retrenchment of bailout expectations, which previously may have existed.

4.4 Robustness

Measuring Trade Misinvoicing

An advantage of our TMI measure is that it allows for variations across trading partners and over time. Columns (2) and (3) of Table 5 compare our baseline results, replicated in Column (1), with those from data derived from alternative assumptions regarding the CIF. The comparison shows that a precise estimation of the CIF is indeed crucial. While the TMI based on alternative CIP assumptions garner determinants, in general, with the same signs, our baseline TMI measure picks up more statistically significant variables than the other two measures.

Column (2) presents results of the TMI constructing with CIF estimates from the *Centre d'Etudes Prospectives et d'Informations Internationales* (CEPII). Both CEPII and OCED estimates follow comparable estimation approaches, but the CEPII dataset has a smaller cross-country coverage.[30] While the signs of the coefficients remain the same for all variables, the statistical significance varies. Most notably, currency misalignment does not enter in a statistically significant way anymore. Also, the adjusted R^2 estimate is considerably lower; it decreases from 57% to 42%.

The previous literature on trade misinvoicing usually does not account for variations in costs of insurance and freight over time and across countries.[31] Column (3) thus compares our baseline estimates to those from the TMI based on the common assumption of a constant 10% CIF. Remarkably, most of the variables become statistically insignificant in this case. Overlooking the variability of CIF estimates can limit the ability to explain capital flight variations.[32]

Another potential factor causing discrepancies in mirror trade statistics besides intentional misinvoicing is data quality and reliability of reporting countries. To address data quality issues, we re-constructed the TIM measure by dropping trading partners which have a low score of the Statistical Capacity Indicator compiled by the World Bank. Specifically, we drop those have a score a) in the lowest quartile, and b) below the median. The regression results based on these two restricted TMI measures are presented under columns (4) and (5), and they are quite similar to the baseline results regarding to the size of the coefficients as well as their statistical significance. Dropping the lowest quartile of countries decreases the standard errors of our estimates only slightly, while dropping all countries below the median marginally increases them. Overall, dropping trading partners that may not offer quality data does not affect our results of factors affecting capital flight.

Estimation Methods and Specification Issues

As another robustness test, we consider different estimation methods and specifications in Tables 6 (TMI) and 7 (PEAF).

[29] See also Mody (2013).
[30] A detailed description of the dataset is given by Gaulier and Zignago (2019).
[31] Cheung *et al.* (2016) – to the best of our knowledge – is the first capital flight study using CEPII data.
[32] In a passing, we note that the R^2 increases to 70% in this specification. This, however, is likely to be caused by the TMI measure (based on constant-CIF) not being stationary.

First, we adopt a Seemingly Unrelated Regression (SUR) estimation approach to allow for possible interactions between the TMI and PEAF equations. The SUR results displayed under column (2) of Tables 6 and 7 are mostly similar to the corresponding ones in Tables 2 and 3. There are only marginal changes on the estimation coefficients, although the adjusted R^2 estimates suggest that SUR provides an overall better fit. However, it is noted that the SUR approach restricts the estimation to the common sample period, which results in losing 16 quarterly observations for TMI. The OLS regression residuals have a positive correlation – but it is rather small (0.183) and a Breusch-Pagan $\chi^2(1)$ test statistic of 2.567 with a p-value of 0.109 does not reject the null hypothesis of indepence. That is, the single equation estimation is relevant.

Second, we experiment with a dynamic specification. Despite the Durbin-Watson statistics – 2.07 for the TMI equation, and 2.66 for the PEAF equation – do not indicate serious issues, we investigate if our results are sensitive to the inclusion of an AR(1)-component. The lagged endogenous variable is neither statistically significant, nor does its inclusion change any results substantially (columns (3) of Tables 6 and 7).[33]

In Tables 6 and 7, we also address the issue of endogeneity in a set of instrumental variables (IV) regressions. Specifically, the interest rate variables as well as the import duties maybe endogenous with respect to our dependent variables. The estimation results from instrumenting both variables with their respective lagged values are presented under columns (6) and (7). The use of IV does not materially change the estimation results pertaining the instrumented variables as well as the other variables in the regression. The IV specifications exhibit no signs of under-, weak-, or over-identification; except for column (6) of Table 7 that seems to be only weakly identified.[34]

Finally, we do not find evidence for unaccounted structural breaks . Potential structural breaks attributed to the adoption of the euro and the onset of the European crisis are assessed, respectively, using a dummy variable of the accession to the European Monetary Union for TMI and a dummy variable of the euro crisis for PEAF. The results presented under columns (8) of Tables 6 and 7 indicate no significant effect of these two structural break dummy variables.[35]

Table B3 of the appendix further examines the effect of the Eurosystem's quantitate easing (officially named Extended Assets Purchase Programme – APP). Observers have repeatedly referred to the direct effect of the asset purchases on recorded capital flows (Eisenschmidt *et al*., 2017). Columns 1 and 2 of Table B3 assess whether the adoption of APP indeed affects our PEAF measure. While the coefficients have the expected negative signs, they are not statistically significant. We furthermore examine the interaction of the APP with the Eurosystem's collateral standards. With the adoption of the APP, refinancing operations become a less important source of bank funding; this may weaken the link between collateral standards and capital flight. While the signs of the coefficients are consistent with this reasoning, the effect of loosened collateral standards did not weaken in a statistically significant order of magnitude.

5. Policy Conclusions and Contribution to the Literature

Our analysis suggests that for Germany there exist (at least) two distinctly different types of capital flight, which can be captured by different proxies; and these proxies each have different determinants. This information is important for policymakers: If they aim to curb illicit capital flows, for instance, it is not sufficient to implement national regulatory reforms, as suggested by the FATF task force. It is also important to take macroeconomic developments into accounts that are ultimately

[33] The same is true when other methods to control for autocorrelation are used. A Prais-Winsten AR(1) regression results in a smaller (transformed) Durbin-Watson-statistic of 2.12, but does not change our results notably (available upon request).

[34] The spread may also be jointly determined (instead of being endogenous). We, therefore, computed the partial correlation in a stricter sense (i.e. regressing both variables on a common set of potentially jointly-determining variables and then looking at the correlation of the residuals of both equations). We find that PEAF and the interest rate spread are still partially correlated even if the influence of all other variables is backed out of *both variables*. Results are available upon request.

[35] Note that the PEAF sample is 1999q1-2018q2, while the TMI sample is 1995q1-2018q2. This makes a symmetric inclusion of a dummy variable difficult. We have opted for dummies that leave a substantial part of the sample period on both sides of the potential structural breakpoint.

driving the capital flight towards Germany. Also, if Germany – or the euro area as a whole – intend to limit intra-euro area capital flight, it is important to be aware of the policy uncertainty, which is driving these capital inflows, beyond pure macro indicators such as debt- or deficit-to-GDP ratios.

Our study offers two refined measures of capital flight, and identifies their potential determinants. All proxies of capital flight – illicit or not, and including ours – are only noisy signals of the underlying activities. We refine the usual TMI proxy to, hopefully, reduce the noise component and to provide a reliable estimate. Also, the intra-euro area claims and liabilities among central banks are often taken as a signal of capital flight, while part of it simply reflects the payment streams associated with the net purchase of goods and services. Our decomposition provides a more accurate capital flight measure, which may be relevant for monitoring the ongoing fragmentation of the euro area's capital market and the flight-to-safety behavior of international investors.

Furthermore, our study investigates capital flight from the perspective of a recipient, or "safe haven" country, instead of the common perspective of an originating country. In this regard, our exercise can be relevant for other countries such as Switzerland, the Netherlands and Norway, which all have become the target of similar capital flight movements. While capital flows associated with an exchange of goods and services can be welfare-enhancing capital movements, pure capital flight constitutes a challenge for both the sending and the receiving countries.

Appendix A: Variable Definitions and Data Sources

Capital Flight	Germany's capital flight. Positive values indicate outward capital flight, negative values indicate inflows. Capital flight is measured either (i) by freight-cost-adjusted trade misinvoicing (*TMI*), or (ii) the adjusted change in TARGET2-claims (PEAF). See below for details.
PEAF	Private capital flight of Germany against the euro area countries, defined as PEAF = D(T2) + CA_EA – CapA – FA_Gov, where D(T2), CA_EA, CapA and FA_Gov are the following balance of payments items of Germany vis-à-vis today's euro area member countries (EA19, fixed composition): D(T2) is the negative change in Germany's TARGET2-claims as a (excluding claims/liabilities from under-/over-issuance of banknotes), CA_EA is the current account balance, CapA, the capital account and FA_Gov are financial account transactions of the German government (e.g. payments to the European Stability Mechanism). PEAF is expressed as a percentage of nominal GDP. Data sources*:* Bundesbank (Codes: BBFI1.M.N.DE.4F.S121.S1.LE.A.FA.O.F2___T2 .S._T.N.N; BBFB1.Q.N.DE.I8.S1.S1.T.B.CA._Z._Z._Z._T._X.N; BB FB1.Q.N.DE.I8.S1.S1.T.C.KA._Z._Z._Z._T._X.N; BBFB1.Q.N.DE.I8.S1.S1.T.D.KA._Z._Z._Z._T._X.N; BBFB1.Q.N.DE .I8.S13.S1.T.A.FA .O.F2.T._T. N.N).
TMI	Germany's capital flight measured by the net trade misinvoing method given by the sum of export underinvoicing and import overinvoicing, i.e. $TMI = \Sigma_i^p [XW_{i,t} - XC_{i,t}*(1+CIF)] + \Sigma_i^q [MC_{i,t} - MW_{i,t}*(1+CIF)]$, where $XW_{i,t}$ is economy *i*'s reported value of imports from Germany, $XC_{i,t}$ is Germany's reported value of exports to country *i*, $MC_{i,t}$ is Germany's reported value of imports from country *i*, $MW_{i,t}$ is economy *i*'s reported value of exports to Germany, *p* is the number trading partners, and *CIF* is the c.i.f./f.o.b. *CIF* estimates are from the OECD (see separate appendix for details). *TMI* is expressed as a percentage of nominal GDP. Positive values indicate outward capital flight. Data sources: Directions of Trade Statistics (IMF), International Transport and Insurance Costs of Merchandise Trade (OECD) by Miao and Fortanier (2017).
APP dummy	A dummy variable, given by the indicator function $I(t >= 2015Q1\})$, capturing the adoption of the Eurosystem's extended Assets Purchase Programme (APP).
APP monthly purchases	Average volume of monthly assets purchases of the Eurosystem under the extended APP in billions of Euros.
CID	Quarterly average of Germany's daily covered interest differentials. It is given by the nominal interest rate differential (*RDiff*) plus the forward premium (*FP*), i.e. $CID = RDiff + FP = (r-r^*)/(1+r^*) + (F-S)/S$, where *r* is the London interbank offer rate (DM-based until 1998; then EUR-based), *r** is the US$ LIBOR, *F* is the forward rate and *S* is the spot exchange rate (DM/USD until 1998; then EUR/USD). *r*, *r** and *F* are annualized three-month rates in daily frequency. Data sources: Bundesbank (Codes: BBK01.ST0268; BBK01.ST0316); ICE Benchmark Administration Ltd. via Datastream (B5DEM3M; B5EUR3M; B5USD3M), Datastream (Codes: WG90DUS; TDEUR3M).
Collateral Standards	Categorical variable taking the value +1 whenever the ECB governing council loosened collateral standards for refinancing operations, -1 when it was tightened, 0 otherwise. We ignore decision ECB/2013/6 as it was reversed before it came into force (ECB/2015/9). Data sources: Eberl and Weber (2014), updated by authors.
Collateral (idiosyncratic)	A dummy variable, given by the indicator function $I(t = \{2011Q4\})$, capturing the ECB governing council's decision to allow country-specific collateral requirements.
Currency Misalignment	Deviation from estimated equilibrium exchange rate (in %). Positive values indicate overvaluation, negative undervaluation. Quarterly frequency interpolated from annual data using cubic splines. Data source: CEPII

	EQCHANGE (average index), see Couharde *et al.* 2018 for details.
Current Account	Germany's current account balance from its balance of payments statistics as a percentage of nominal GDP (both in national currency). Seasonally adjusted using US Census' X-11 method. Data source: Bundesbank (Code: BBFB1.Q.N.DE.W1.S1.S1.T.B.CA._Z._Z._Z._T._X.N).
EA Spread	Simple average of long-term (10y) government bond spreads of Ireland, Italy, Portugal, and Spain vis-à-vis Germany. Data sources: OECD (Finance).
Gov. Debt	Germany's gross consolidated general government debt as percentage of nominal GDP (seasonally adjusted). Data before 2000Q1 have been interpolated from annual to quarterly frequency using cubic splines. Data source: Federal Statistical Office (Destatis), Eurostat (Code: gov_10q_ggdebt).
Economic Policy Uncertainty (news)	Global and US indexes of economic policy uncertainty based on normalized newspaper coverage frequencies. Source and description: Baker *et al.* (2016) and updates from their website.
Economic Policy Uncertainty (expert)	Global and regional indexes of economic policy uncertainty based on the frequency counts of the term „uncertainty" in country reports of the Economist Intelligence Unit. Source and description: Ahir *et al.* (2018).
Exr. Volatility	Empirical standard deviation of the i) log-level or ii) changes in the log-level of the daily nominal exchange rate of the German currency (DM/EUR) vis-à-vis the USD. Data sources: Bundesbank (Codes: BBEX3.D.USD.DEM.AA.AC.000; BBEX3.D.USD.EUR.BB.AC.000).
Forward Premium	Quarterly average of Germany's daily forward premium given by *(F-S)/S*, where *S* is the spot rate and *F* the 3-month forward rate (DM/USD until 1998; then EUR/USD). An *FP* > 0 indicates an expected $ appreciation. Data sources: Bundesbank (Codes: BBK01.ST0268; BBK01.ST0316), Datastream (Codes: WG90DUS; TDEUR3M).
Geopolitical Risk Index	Normalized number of newspaper articles related to geopolitical risk in 11 large US and international newspapers. Source and detailed description: Caldara and Iacoviello (2018).
Gov. Bal.	Germany's general government balance as percentage of nominal GDP, both in national currency. Seasonally adjusted. Two outliers have both been replaced by linearly interpolated values to match the mean of the last (t-1) and the following (t+1) quarter: In 1995Q1 the German government assumed liabilities of the Treuhandanstalt (an agency charged with liquidating assets formerly owned by the East German government). In 2000Q3 extraordinary revenue was generated by auctioning of UMTS-licences. Data source: Federal Statistical Office (Destatis).
Inflation Diff.	The difference between the German and US annualized inflation rate in percentage points. Annualized inflation rates in percentage points and based on the quarter-to-quarter relative change in the consumer price index. Data source: IMF's International Financial Statistics (Code: PCPI_PC_PP_PT).
Money Growth M1 (M3)	Quarter-to-Quarter change of (seasonally adjusted) monetary aggregate M1 (M3, respectively) as percentage of nominal GDP (series in national currency). Data source: OECD (Finance).
Nominal GDP	Gross Domestic Product at current prices. Derived from expenditure approach and seasonally adjusted. Data sources: Federal Statistical Office (Destatis).
PSI - Deauville Meeting	A dummy variable, given by the indicator function $I(t >= 2010Q4\})$, capturing the Deauville meeting.
PSI - Greece	A dummy variable, given by the indicator function $I(t >= 2012Q1\})$, capturing the Greek debt restructuring with private sector involvement.
Interest Rate Differential	Quarterly average of the daily interest rate differential given by $(r-r^*)/(1+r^*)$, where r is the relevant London

	interbank offer rate (DM-based until 1998; then EUR-based), r* is the US$ LIBOR. All as annualized three-month rates. Positive values of *RDiff* indicate a higher nominal return on investment in Germany. Data sources: ICE Benchmark Administration Ltd. via Datastream (B5DEM3M; B5EUR3M; B5USD3M).
Redenomination Risk	Market-sentiment based measure of redenomination risks given by the volume of Google searches implying the term "euro breakup" relative to its maximum [index 11/2011=100] after 2004, zero before. Data source: Google Application Trends.
Relative Money M1 (M3)	Monetary aggregate M1 (M3, respectively) of Germany relative to the US, both seasonally adjusted and in percentage of nominal GDP. After the Euro introduction Germany's monetary aggregates refers to its contribution to the euro area's total. Data sources: Bundesbank, OECD, US Federal Reserve.
Rel. M1 (M3) Growth	Quarter-to-quarter change of the variable *Relative Money M1 (M3).* Data sources: Bundesbank, OECD, US Federal Reserve.
Real GDP Growth	Quarter-to-quarter growth rate of Germany's real GDP. Real GDP is derived from nominal GDP adjusted for changes in consumer prices and seasonal patterns. Data sources: Federal Statistical Office (Destatis), IMF's International Financial Statistics (Code: PCPI_IX).
Shadow Economy	Size of the informal economy expressed as a percentage of (official) nominal GDP. Source: Medina & Schneider (2018).
World Bank Statistical Capacity Score	Worldwide average of a composite score assessing the capacity of the country's statistical system. Based on the average score, each between 0-100, over 25 criteria (e.g. methodology, data sources, periodicity & timelines). No data before 2004. Source: World Bank (Code: IQ.SCI.OVRL).
Stock Volatility	(Option-)implied stock market volatility. We use the VDAX for Germany, the VOXX for the euro area, and the VIX for the US. Quarterly averages of daily data. Data source: Datastream.
Tax Ratio	Sum of (seasonally adjusted) government revenue from taxes and social security contributions as a percentage of nominal GDP. Data source: Federal Statistical Office (Destatis).
Import Duties Ratio	Sum of tariffs and import VAT as a percentage of the same period's value of imports. Annual data from 1991 to 1998 interpolated to quarterly frequency using cubic splines. Data sources: Ministry of Finance, Federal Statistical Office (Destatis).
Trade Openness	Measure of de facto trade openness, given by the value of the total trade volume as a percentage of nominal GDP. Data source: IMF's International Financial Statistics (Code: TXG_FOB_USD, TMG_CIF_USD).
Violent conflicts	(Logged) worldwide battle-related deaths. Converted to quarterly frequency using cubic splines. Source: World Bank (Code: VC.BTL.DETH).

Appendix B: Additional Regression Tables

Table B1: PEAF – Greek Uncertainty (Subcomponents)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CID	0.185	0.293	0.146	0.150	0.125	0.141	0.093	0.038	0.220
	(0.43)	(0.68)	(0.34)	(0.34)	(0.29)	(0.32)	(0.21)	(0.09)	(0.51)
Currency Misalignment	0.893	0.005	-0.457	1.446	0.819	1.544	2.052	0.053	1.240
	(0.26)	(0.00)	(0.13)	(0.41)	(0.24)	(0.44)	(0.56)	(0.02)	(0.36)
Gov. Debt	0.041**	0.041**	0.046**	0.041*	0.042**	0.027	0.038*	0.036*	0.037*
	(2.05)	(2.06)	(2.31)	(1.89)	(2.04)	(1.24)	(1.84)	(1.83)	(1.88)
D(EA Spread)	-0.984***	-1.001***	-1.029***	-1.076***	-1.047***	-1.088***	-1.184***	-1.065***	-0.989***
	(4.18)	(4.36)	(4.61)	(4.49)	(4.48)	(4.61)	(5.03)	(4.70)	(4.23)
Collateral Standards	-0.611*	-0.573*	-0.597*	-0.587*	-0.604*	-0.627*	-0.614*	-0.637**	-0.610*
	(1.96)	(1.84)	(1.94)	(1.80)	(1.91)	(1.96)	(1.91)	(2.03)	(1.95)
Collateral (Idiosyn.)	-4.084***	-4.229***	-3.852***	-3.940***	-3.999***	-4.065***	-3.754***	-4.046***	-4.145***
	(3.85)	(3.99)	(3.69)	(3.64)	(3.73)	(3.71)	(3.38)	(3.80)	(3.90)
EU Policy Uncertainty	-0.006*	-0.008**	-0.008***	-0.008**	-0.007**	-0.008**	-0.009***	-0.006*	-0.007**
(Expert)	(1.95)	(2.44)	(2.72)	(2.54)	(2.21)	(2.60)	(2.76)	(1.83)	(2.02)
GREECE – ECONOMIC POLICY UNCERTAINTY (EPU)									
EPU (all)	-0.011*								
	(1.96)								
EPU (Banking)		-0.011**							
		(2.15)							
EPU (Currency)			-0.007**						
			(2.42)						
EPU (Debt)				-0.003					
				(0.82)					
EPU (Fiscal)					-0.008				
					(1.44)				
EPU (Monetary)						-0.004			
						(0.79)			
EPU (Pension)							0.003		
							(0.79)		
EPU (Tax)								-0.010*	
								(1.78)	
Economic Uncertainty									-0.011**
(broad)									(2.01)
Constant	-1.279	-1.264	-1.801	-1.827	-1.601	-0.876	-2.100	-1.101	-0.984
	(0.88)	(0.88)	(1.27)	(1.23)	(1.10)	(0.49)	(1.34)	(0.74)	(0.67)
R-Squared (adj)	0.50	0.51	0.52	0.48	0.49	0.48	0.48	0.50	0.50
Observations	76	76	76	76	76	76	76	76	76

Notes: OLS estimates with t-statistics in parentheses. All specifications include quarterly dummies (not reported). *, **, *** indicate variables significant at 10%, 5%, and 1% level respectively.

Table B2: PEAF – Economic Policy Uncertainty and Bailout Expectations

	ECONOMIC POLICY UNCERTAINTY (EPU) MEASURE								
	EU EPU (Expert)	EU EPU (News)	PCA (Expert)	PCA News (News)	Greece EPU (Expert)	Ireland EPU (Expert))	Italy EPU (Expert)	Portugal EPU (Expert)	Spain EPU (Expert)
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CID	0.109	0.220	0.131	0.269	0.177	0.193	0.332	-0.087	0.339
	(0.25)	(0.48)	(0.30)	(0.58)	(0.41)	(0.41)	(0.72)	(0.19)	(0.71)
Currency Misalignment	0.694	3.912	1.119	3.698	1.046	3.351	4.206	3.125	4.239
	(0.15)	(0.82)	(0.24)	(0.77)	(0.23)	(0.69)	(0.92)	(0.66)	(0.92)
Gov. Debt	0.030	0.033	0.031	0.031	0.047*	0.037	0.046*	0.045*	0.039
	(1.26)	(1.32)	(1.33)	(1.26)	(1.94)	(1.49)	(1.96)	(1.87)	(1.59)
D(EA Spread)	-1.149***	-1.049***	-1.216***	-1.028***	-0.936***	-1.198***	-1.336***	-1.108***	-1.048***
	(4.97)	(4.41)	(5.22)	(4.34)	(4.13)	(4.67)	(5.17)	(4.61)	(4.44)
Collateral Standards	-0.667**	-0.468	-0.686**	-0.428	-0.897***	-0.606*	-0.620*	-0.484	-0.765**
	(2.07)	(1.37)	(2.14)	(1.24)	(2.78)	(1.78)	(1.90)	(1.39)	(2.28)
Collateral (Idiosyncratic)	-3.971***	-3.954***	-4.132***	-4.096***	-3.543***	-3.514***	-4.092***	-3.858***	-4.241***
	(3.64)	(3.53)	(3.81)	(3.64)	(3.33)	(3.07)	(3.68)	(3.40)	(3.71)
PSI (Deauvile)	1.130	1.193	0.221	0.191	0.286	-0.031	0.474	0.102	0.138
	(1.05)	(0.98)	(0.38)	(0.31)	(0.50)	(0.05)	(0.72)	(0.15)	(0.20)
EU EPU (γ_1)	-0.002	-0.002	-0.094	-0.094	0.593	-0.395	0.275	-0.124	-0.452
	(0.43)	(0.52)	(0.46)	(0.61)	(0.52)	(0.55)	(0.31)	(0.10)	(0.41)
PSI X EU EPU (γ_2)	-0.009	-0.007	-0.360	-0.224	-4.153***	-1.267	-3.322**	-2.480	-1.823
	(1.27)	(1.11)	(1.42)	(1.15)	(2.71)	(1.00)	(2.18)	(1.26)	(1.17)
EU EPU total $\gamma_1 + \gamma_2$	-0.011***	-0.009**	-0.453***	-0.317**	-3.560***	-1.661	-3.048**	-2.605	-2.275**
	(2.84)	(2.18)	(3.05)	(2.27)	(3.37)	(1.49)	(2.47)	(1.66)	(2.06)
Constant	-1.970	-2.365	-2.455	-2.564	-3.421**	-2.737	-3.535**	-3.291**	-2.993*
	(1.20)	(1.48)	(1.59)	(1.62)	(2.14)	(1.65)	(2.29)	(2.05)	(1.92)
R-Squared (adj)	0.48	0.45	0.49	0.45	0.50	0.43	0.46	0.43	0.45
Observations	76	76	76	76	76	76	76	76	76

Notes: OLS estimates with t-statistics in parentheses. All specifications include quarterly dummies (not reported). *, **, *** indicate variables significant at 10%, 5%, and 1% level respectively.

Table B3: PEAF – (Extended) Assets Purchase Programme by the Eurosystem

Variables	(1)	(2)	(3)	(4)
CID	0.186	0.169	0.213	0.244
	(0.39)	(0.37)	(0.42)	(0.51)
Currency Misalignment	0.687	0.883	0.510	0.303
	(0.16)	(0.23)	(0.12)	(0.08)
Gov. Debt	0.032	0.033	0.032	0.033
	(1.38)	(1.40)	(1.38)	(1.41)
D(EA Spread)	-1.135***	-1.135***	-1.138***	-1.147***
	(4.96)	(4.96)	(4.92)	(4.96)
Collateral Standards (μ_1)	-0.656**	-0.642**	-0.687*	-0.729**
	(2.00)	(2.00)	(1.81)	(2.06)
Collateral (Idiosyncratic)	-3.964***	-3.961***	-3.961***	-3.952***
	(3.63)	(3.63)	(3.60)	(3.60)
EU Policy Uncertainty	-0.008**	-0.008**	-0.008**	-0.009**
	(2.32)	(2.19)	(2.25)	(2.26)
APP dummy	-0.127		-0.136	
	(0.22)		(0.23)	
APP monthly purchases		-0.002		-0.003
		(0.18)		(0.34)
Collateral Standards X APP (μ_2)			0.147	0.009
			(0.16)	(0.59)
Collateral Standards total ($\mu_1 + \mu_2$)			-0.540	-0.720**
			(0.69)	(4.27)
Constant	-1.539	-1.570	-1.541	-1.527
	(0.96)	(0.99)	(0.95)	(0.96)
R-Squared (adj)	0.47	0.47	0.46	0.47
Observations	76	76	76	76

Notes: OLS estimates with t-statistics in parentheses. All specifications include quarterly dummies (not reported). *, **, *** indicate variables significant at 10%, 5%, and 1% level respectively.

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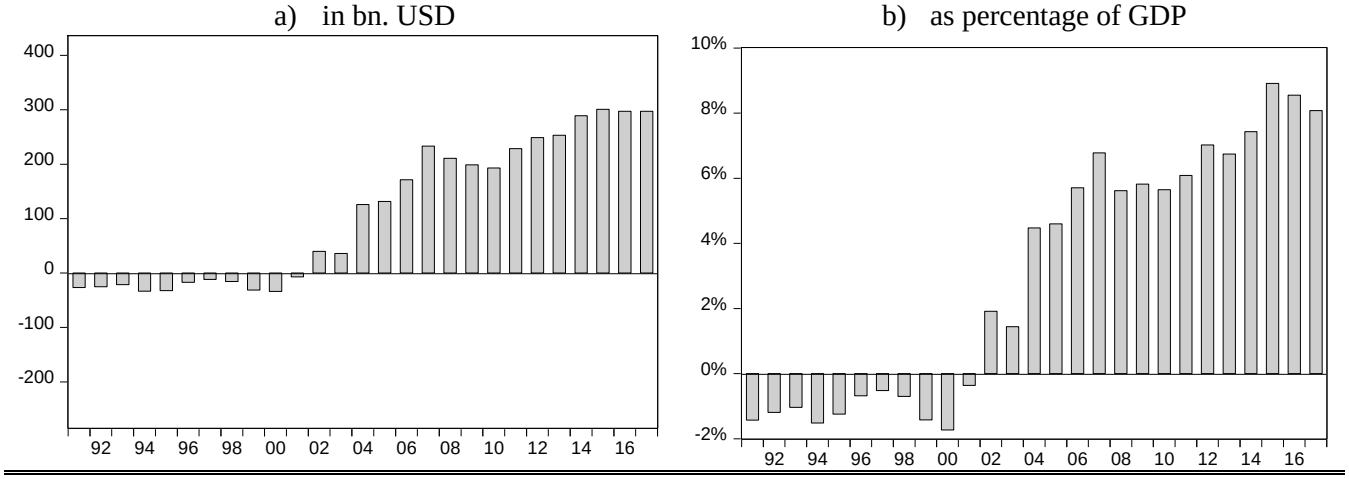
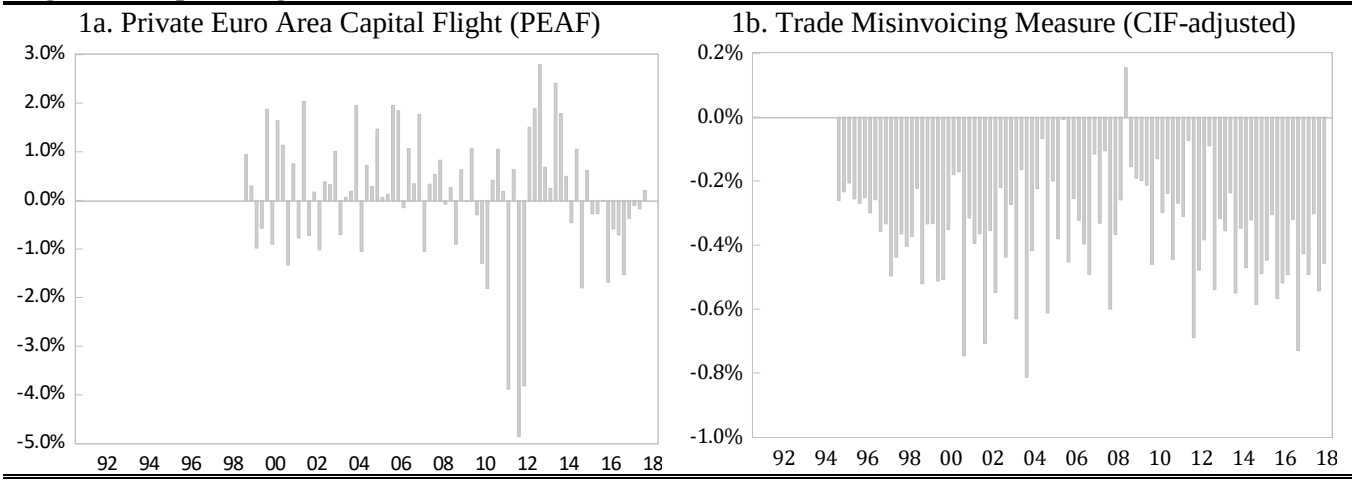
Figure 1: Germany's Net Current Account Position



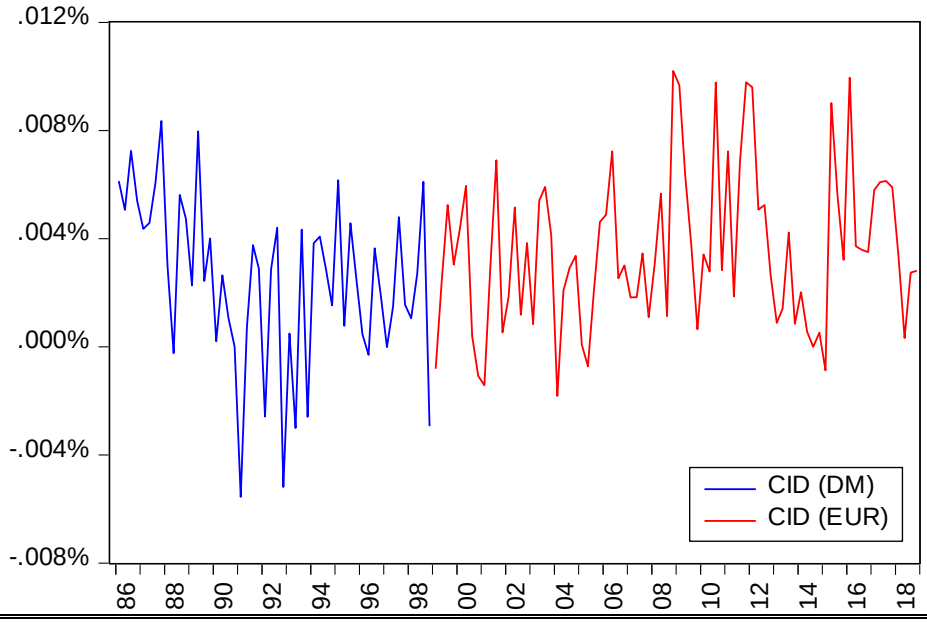
Data sources: World Bank WDI (Codes: BN.CAB.XOKA.CD; BN.CAB.XOKA.GD.ZS).

Figure 2: Capital Flight Measures



Notes: Two different measures of capital flight based on the (a) adjusted negative change in TARGETt2-claims (PEAF), and (b) the CIF-adjusted trade misinvoicing method. Both series as percentage of (annualized) nominal GDP. See data appendix for details on definitions and data sources.

Figure 3: Deviations from the Covered Interest Parity (CID)



Notes: Quarterly average of Germany's daily covered interest differentials (blue: DM; red: EUR). It is given by the nominal interest rate differential (*RDiff*) plus the forward premium (*FP*), i.e. $CID = RDiff + FP = (r-r^*)/(1+r^*) + (F-S)/S$, where r is the London interbank offer rate (DM-based until 1998; then EUR-based), r^* is the US$ LIBOR, F is the forward rate and S is the spot exchange rate (DM/USD until 1998; then EUR/USD). r, r^* and F are annualized three-month rates in daily frequency. Data sources: Bundesbank (Codes: BBK01.ST0268; BBK01.ST0316); ICE Benchmark Administration Ltd. via Datastream (B5DEM3M; B5EUR3M; B5USD3M), Datastream (Codes: WG90DUS; TDEUR3M).

Table 1: Unit Root Tests

	DF-GLS	PHILLIPS-PERRON	
	H0: Has a Unit Root		
Variable	t-stat	Adj. t-stat	Sample
PEAF	-7.022***	-7.806***	1999Q1-2018q3 (Full/Common)
TMI	-1.978**	-10.316***	1996Q1-2018q3 (Full)
	-2.390**	-9.761***	1999Q1-2018q3 (Common)

Notes: All specifications include a constant (and no deterministic trend). AR(p)-choice in Dickey Fuller test based on SIC. PP tests based on Bartlett-kernel estimation with Newey-West automatic bandwidth selection.

Table 2: Determinants of TMI – Baseline Results

	Arbitrage Motive	Canonical Fundamentals	Monetary Factors	Measure-specific	Full	Stepwise
Variables	(1)	(2)	(3)	(4)	(5)	(6)
CID	0.054	0.038	0.043	0.034	0.012	-0.002
	(1.12)	(0.80)	(0.89)	(0.62)	(0.22)	(0.04)
Real GDP Growth		-0.014*			-0.010	-0.012*
		(1.96)			(1.13)	(1.80)
Inflation Diff.		0.015*			0.013	0.014*
		(1.97)			(1.63)	(1.88)
Currency Misalignment		1.119***			1.117**	0.975***
		(3.71)			(2.35)	(3.92)
Gov. Debt		0.007***			0.003	0.005*
		(2.79)			(0.70)	(1.95)
Gov. Bal.		0.003			0.002	
		(0.37)			(0.12)	
Tax Ratio		0.001			0.004	
		(0.04)			(0.22)	
Stock Volatility (VDAX)		0.000			-0.000	
		(0.10)			(0.13)	
Rel. M1 Growth			0.203**		0.130	
			(2.01)		(1.16)	
Rel. M3 Growth			-0.236		-0.259	
			(1.30)		(1.19)	
Exr. volatility				0.224**	0.147	0.184**
				(2.60)	(1.57)	(2.40)
Import Duties Ratio				-0.116***	-0.062	-0.069**
				(3.47)	(1.52)	(2.24)
Shadow Economy				0.016**	-0.008	
				(2.19)	(0.30)	
D(Trade Openness)				-0.005	0.004	
				(0.63)	(0.51)	
Constant	-0.389***	-0.856	-0.392***	0.050	-0.352	-0.350
	(11.31)	(1.22)	(11.54)	(0.27)	(0.47)	(1.16)
R-Squared (adj)	0.39	0.52	0.41	0.48	0.50	0.57
Observations	94	92	94	84	84	92

Notes: OLS estimates with t-statistics in parentheses. All specifications include quarterly dummies (not reported). *, **, *** indicate variables significant at 10%, 5%, and 1% level respectively.

Table 3: Determinants of PEAF – Baseline Results

	Arbitrage Motive	Canonical Fundamentals	Monetary Factors	Measure-specific	Full	Stepwise
Variables	(1)	(2)	(3)	(4)	(5)	(6)
CID	-1.321***	-0.925	-1.399***	-0.153	0.168	-0.002
	(2.65)	(1.64)	(2.74)	(0.32)	(0.33)	(0.00)
Real GDP Growth		-0.035			0.059	
		(0.38)			(0.68)	
Inflation Diff.		-0.048			-0.009	
		(0.50)			(0.11)	
Currency Misalignment		3.340			8.347*	7.146**
		(0.72)			(1.97)	(2.56)
Gov. Debt		-0.002			0.037	0.037*
		(0.09)			(1.40)	(1.76)
Gov. Bal.		0.000			-0.016	
		(0.00)			(0.16)	
Tax Ratio		-0.029			-0.024	
		(0.16)			(0.15)	
Stock Volatility (VDAX)		-0.027			-0.013	
		(1.42)			(0.74)	
Rel. M1 Growth			0.896		0.663	
			(0.84)		(0.64)	
Rel. M3 Growth			-0.980		-1.914	
			(0.48)		(0.85)	
D(EA Spread)				-0.888***	-1.018***	-1.025***
				(3.66)	(3.62)	(4.40)
D(Redenomination Risk)				-0.004	-0.004	
				(0.39)	(0.36)	
Collateral Standards				-0.497	-0.645	-0.667**
				(1.42)	(1.58)	(2.00)
Collateral (idiosyncratic)				-3.700***	-3.587***	-3.795***
				(3.19)	(2.89)	(3.36)
Constant	0.034	2.031	0.032	-0.345	-1.733	-2.935**
	(0.10)	(0.23)	(0.09)	(1.13)	(0.22)	(2.02)
R-Squared (adj)	0.13	0.09	0.11	0.38	0.38	0.43
Observations	77	76	77	77	76	76

Notes: OLS estimates with t-statistics in parentheses. All specifications include quarterly dummies (not reported). *, **, *** indicate variables significant at 10%, 5%, and 1% level respectively.

Table 4: PEAF – The Role of EU Economic Policy Uncertainty

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CID	0.150	0.184	0.250	0.187	0.075	0.087	0.107	-0.042	0.252
	(0.34)	(0.41)	(0.54)	(0.42)	(0.17)	(0.19)	(0.23)	(0.09)	(0.54)
Currency Misalignment	1.186	2.841	2.689	0.911	3.667	5.494*	6.437**	5.667*	6.298**
	(0.34)	(0.82)	(0.78)	(0.26)	(1.15)	(1.77)	(2.28)	(1.85)	(2.26)
Gov. Debt	0.035*	0.041*	0.036*	0.040**	0.029	0.030	0.038*	0.035*	0.039*
	(1.72)	(1.99)	(1.77)	(2.02)	(1.40)	(1.38)	(1.83)	(1.69)	(1.89)
D(EA Spread)	-1.136***	-1.013***	-0.999***	-1.199***	-1.007***	-1.092***	-1.120***	-1.046***	-1.010***
	(5.00)	(4.45)	(4.39)	(5.20)	(4.43)	(4.57)	(4.60)	(4.48)	(4.40)
Collateral Standards	-0.641**	-0.474	-0.429	-0.630*	-0.765**	-0.606*	-0.669**	-0.600*	-0.749**
	(2.01)	(1.40)	(1.25)	(1.99)	(2.33)	(1.81)	(2.02)	(1.78)	(2.26)
Collateral (Idiosyncratic)	-3.946***	-3.974***	-4.096***	-4.034***	-3.583***	-3.676***	-3.876***	-3.834***	-4.148***
	(3.65)	(3.59)	(3.69)	(3.75)	(3.25)	(3.26)	(3.45)	(3.41)	(3.68)
EU EPU (Expert)	-0.008***								
	(2.66)								
EU EPU (News)		-0.006**							
		(2.04)							
PRINCIPAL COMPONENTS									
PCA Expert (Global, EU, DE)			-0.218**						
			(2.10)						
PCA News (Global, EU, DE)				-0.315***					
				(2.81)					
COUNTRY-LEVEL SUBCOMPONENTS									
Greece EPU (Expert)					-1.692**				
					(2.11)				
Ireland EPU (Expert))						-0.746			
						(1.20)			
Italy EPU (Expert)							-0.899		
							(1.28)		
Portugal EPU (Expert)								-1.088	
								(1.14)	
Spain EPU (Expert)									-1.383*
									(1.78)
Constant	-1.675	-2.451*	-2.995**	-3.223**	-2.163	-2.308	-2.893**	-2.657*	-2.912**
	(1.14)	(1.70)	(2.11)	(2.33)	(1.48)	(1.50)	(2.00)	(1.81)	(2.04)
R-Squared (adj)	0.48	0.46	0.46	0.48	0.46	0.44	0.44	0.43	0.45
Observations	76	76	76	76	76	76	76	76	76

Notes: OLS estimates with t-statistics in parentheses. All specifications include quarterly dummies (not reported). *, **, *** indicate variables significant at 10%, 5%, and 1% level respectively.

Table 5: Different Measures of TMI

		CIF ASSUMPTION		MEASUREMENT ERROR	
	(Baseline)	(BACI CIF)	(Constant 10%)	(w/o lowest quartile)	(w/o below median)
Variables	(1)	(2)	(3)	(4)	(5)
CID	-0.002	-0.046	-0.089	-0.005	0.001
	(0.04)	(0.76)	(1.23)	(0.10)	(0.02)
Real GDP Growth	-0.012*	-0.019**	-0.012	-0.012*	-0.011*
	(1.80)	(2.13)	(1.19)	(1.80)	(1.68)
Inflation Diff.	0.014*	0.011	0.017	0.016**	0.016**
	(1.88)	(1.18)	(1.53)	(2.14)	(2.17)
Currency Misalignment	0.975***	0.216	2.969***	0.831***	0.862***
	(3.92)	(0.67)	(7.71)	(3.31)	(3.46)
Gov. Debt	0.005*	0.007**	-0.005	0.004*	0.003
	(1.95)	(2.12)	(1.36)	(1.68)	(1.34)
Exr. volatility	0.184**	0.263**	0.116	0.195**	0.188**
	(2.40)	(2.63)	(0.98)	(2.51)	(2.44)
Import Duties Ratio	-0.069**	-0.109***	0.044	-0.082***	-0.081**
	(2.24)	(2.73)	(0.92)	(2.65)	(2.63)
Constant	-0.350	0.074	-1.392***	-0.247	-0.211
	(1.16)	(0.19)	(3.00)	(0.81)	(0.70)
R-Squared (adj)	0.57	0.42	0.70	0.57	0.57
Observations	92	92	92	92	92

Notes: OLS estimates with t-statistics in parentheses. All specifications include quarterly dummies (not reported). *, **, *** indicate variables significant at 10%, 5%, and 1% level respectively.

Table 6: TMI – Estimation Method and Specification Issues

	Baseline / OLS	SUR	Dynamic	IV (CID; Imp. Duties)	IV (Imp. Duties)	EMU-membership / Structural Break
Variables	(1)	(2)	(3)	(6)	(7)	(8)
CID	-0.002	0.017	0.011	-0.014	-0.014	-0.003
	(0.04)	(0.39)	(0.23)	(0.31)	(0.31)	(0.06)
Real GDP Growth	-0.012*	-0.009	-0.011	-0.013*	-0.013*	-0.012*
	(1.80)	(1.40)	(1.64)	(1.96)	(1.96)	(1.71)
Inflation Diff.	0.014*	0.007	0.014*	0.015**	0.015**	0.014*
	(1.88)	(0.99)	(1.95)	(2.08)	(2.08)	(1.88)
Currency Misalignment	0.975***	1.087***	1.167***	0.900***	0.901***	1.008***
	(3.92)	(3.59)	(4.08)	(3.73)	(3.74)	(3.46)
Gov. Debt	0.005*	0.004**	0.005**	0.002	0.003	0.005*
	(1.95)	(1.97)	(2.07)	(1.01)	(1.03)	(1.91)
Exr. volatility	0.184**	0.265***	0.196**	0.231***	0.230***	0.182**
	(2.40)	(3.47)	(2.48)	(3.03)	(3.01)	(2.34)
Import Duties Ratio	-0.069**	-0.091***	-0.073**	-0.131***	-0.129***	-0.068**
	(2.24)	(3.34)	(2.33)	(3.37)	(3.33)	(2.20)
Lagged TMI			-0.064			
			(0.59)			
EMU-membership						0.009
						(0.22)
Constant	-0.350	-0.232	-0.388	0.171	0.158	-0.357
	(1.16)	(0.88)	(1.29)	(0.48)	(0.44)	(1.17)
R-Squared (adj)	0.57	0.71	0.57	0.54	0.54	0.56
Observations	92	76/76	91	92	92	92

Notes: OLS estimates with t-statistics in parentheses. All specifications include quarterly dummies (not reported). *, **, *** indicate variables significant at 10%, 5%, and 1% level respectively.

Table 7: PEAF – Estimation Method and Specification Issues

	Baseline / OLS	SUR	Dynamic	IV (CID; Spread)	IV (Spread)	EA Crisis / Structural Break
Variables	(1)	(2)	(3)	(6)	(7)	(8)
CID	0.150	0.097	0.117	-0.384	0.518	0.155
	(0.34)	(0.24)	(0.25)	(0.24)	(1.13)	(0.35)
Currency Misalignment	1.186	1.913	1.120	1.055	1.388	1.156
	(0.34)	(0.60)	(0.32)	(0.31)	(0.41)	(0.33)
Gov. Debt	0.035*	0.034*	0.035*	0.036*	0.038*	0.035*
	(1.72)	(1.85)	(1.69)	(1.84)	(1.93)	(1.71)
D(EA Spread)	-1.136***	-1.098***	-1.158***	-1.497***	-1.723***	-1.135***
	(5.00)	(2.31)	(4.83)	(3.23)	(5.02)	(4.96)
Collateral Standards	-0.641**	-0.670**	-0.641*	-0.519	-0.646**	-0.642**
	(2.01)	(2.31)	(1.98)	(1.37)	(2.09)	(2.00)
Collateral (Idiosyncratic)	-3.946***	-3.647***	-3.901***	-3.402***	-3.690***	-3.945***
	(3.65)	(3.71)	(3.53)	(2.89)	(3.49)	(3.62)
EU EPU (Expert)	-0.008***	-0.007**	-0.009**	-0.009**	-0.010***	-0.008**
	(2.66)	(2.53)	(2.62)	(2.55)	(3.15)	(2.64)
Lagged PEAF			-0.035			
			(0.34)			
EA Crisis						-0.109
						(0.10)
Constant	-1.675	-1.793	-1.612	-1.518	-1.836	-1.575
	(1.14)	(1.32)	(1.07)	(1.00)	(1.29)	(0.89)
R-Squared (adj)	0.48	0.55	0.47	0.43	0.43	0.47
Observations	76	76/76	75	76	76	76

Notes: Estimated coefficients under different estimation methods with t/z-statistics in parentheses. All specifications include quarterly dummies (not reported). *, **, *** indicate variables significant at 10%, 5%, and 1% level respectively.