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Abstract

Multinational institutions face an important trade-off when hiring personnel. On the one hand, hiring decisions are based, as in most organizations, on a candidate's professional qualifications. On the other hand, multinational institutions often aim for broad national representation. Reviewing evidence from the European Central Bank, we show that nationality is indeed relevant for both hiring and decision-making. Specifically, we identify various country-specific features that determine national representation in the top management of the ECB. Further, there is evidence for the existence of national networks between adjacent management layers. Finally, monetary policy decisions seem to be linked to national representation in the core business areas of the ECB. Examining a sample of 14 European countries over the period from 1999 to 2008, we estimate Taylor rules for alternative sets of euro area aggregates derived from different weighting schemes of national macroeconomic data. Our results indicate that weights based on national representation in the mid-level management of the ECB's core business areas best describe the central bank's interest-rate setting behavior.

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Keywords: organization, central bank, nationality, monetary policy.

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I. Introduction

In central banking, the geographical background of decision-makers and staff is often an issue of considerable relevance. Some central banks require that its staff members have the nationality of the home country. The central bank of the Philippines, for instance, requires that applicants for employment must be Filipino citizens.¹ Other central banks have established monetary policy decision-making bodies in which, by law, (some) seats are explicitly allocated by region. In Pakistan, for instance, the central bank's central board of directors comprises one director from each of the provinces.²

Having no firm basis in theory, the focus on geographical representation has, in practice, both benefits and costs. Governments and central banks that implement such rules generally aim to improve decision-making and credibility, two important conditions for the success of monetary policy. Specifically, it is argued that regional representatives bring with them specific knowledge of local conditions, thereby allowing to collect and process a broader range of information. Also, regional representatives are able to communicate decisions to a wider public.³ At the same time, however, when the geographical background of an individual is taken explicitly into consideration, other potential criteria, most notably a candidate's professional qualifications, automatically become relatively less important for appointment and promotion.

In this paper, we examine empirically issues related to the geographical representation of personnel in central banks. Analyzing the composition of the management team at the European Central Bank (ECB), we ask whether regional features matter for employment. We also search for evidence of networks among staff members along regional lines. Finally, we

¹ See <http://www.bsp.gov.ph/about/recruitment.asp>. Citizenship is a requirement that is occasionally even included in the central bank law, typically for influential positions such as board members or shareholders. For instance, for members of the Monetary Committee, Article 16 of the Bank of Israel law stipulates that "[a] member from amongst the public shall be qualified for appointment if he is a resident of Israel" (see http://www.bankisrael.gov.il/deptdata/pikuah/bank_hakika/eng/new_law_2010_eng.pdf). The South African Reserve Bank Act requires, in Article 4, that "[n]o person shall be appointed or elected as or remain a director if he or she is not resident in the Republic" (see [http://www.reservebank.co.za/internet/Publication.nsf/LADV/7DC59462E47AFDDF42256ED60038AE5C/\\$File/S+A+Reserve+Bank+Act.pdf](http://www.reservebank.co.za/internet/Publication.nsf/LADV/7DC59462E47AFDDF42256ED60038AE5C/$File/S+A+Reserve+Bank+Act.pdf)). The State Bank of Pakistan Act notes that "no person shall be registered as a shareholder [...] who is not a citizen of Pakistan" (see <http://www.sbp.org.pk/about/act/SBP-Act.pdf>).

² See <http://www.sbp.org.pk/about/act/SBP-Act.pdf>. In similar fashion, the central board of directors of the Reserve Bank of India comprises one director from each of the four local boards (see <http://rbidocs.rbi.org.in/rdocs/Publications/PDFs/RBIA1934170510.pdf>). Central banks that aim for broad regional representation in their supervisory bodies include Danmarks Nationalbank and the Swiss National Bank.

³ See, for instance, Goodfriend (1999) for a more detailed discussion.

examine whether the regional composition of central bank staff has a measurable impact on policy-making.

The focus on the ECB has, for our purposes, a number of useful features. First, the ECB is a multinational institution, such that nationality is a reasonable approach to differentiate geographical background.⁴ Also, nationality is a personal characteristic that is easily observed, both internally and externally. Second, the ECB is a young institution. Having been officially established in 1998, it had to build up its staff quickly from virtually zero so that there are hardly persistence effects in recruiting. Third, the ECB is an institution of great policy relevance. The ECB is not only the largest European Union financial body, it also has financial and organizational autonomy.⁵ Given the ECB's genuine powers, governments of euro area member states should have a strong incentive for national representation in this institution.⁶ Fourth, in contrast to other policy areas in the European Union, monetary policy directly affects economic conditions in all euro area member countries, thereby providing another strong incentive for national representation.

In our analysis, we focus particularly on national representation at the management level of the ECB, a choice that is motivated by a large organizational literature. For instance, Pfeffer (1985, p. 68) argues that "[o]rganizations are full of people. It often seems only natural and appropriate to analyze and manage organizations using individuals as the units of analysis." Thereby, we go substantially beyond previous work with a focus on national representation in the ECB's decision-making body, the Governing Council.⁷ Instead of examining de jure representation of countries as defined in political documents, we analyze de facto presence of nationals in the institution. Specifically, we estimate panel data models for staff shares of the 27 member states of the European Union (EU) in the top management of the ECB over the period from 1999 through 2010.

Previewing our results, we find that a nation's share of ECB managers is reasonably explained by country-level determinants of job applications (such as a country's distance from the ECB headquarter) rather than broad geographical representation. This finding seems to

⁴ Egeberg (1996) follows a similar approach.

⁵ The European Investment Bank and the European Investment Fund are other financial bodies of the European Union (see http://europa.eu/institutions/financial/index_en.htm).

⁶ Scheller (2004, p. 44) notes: "As an organization created by the EC Treaty, the ECB enjoys genuine powers. [...] This feature distinguishes the ECB from the various decentralized agencies of the Community, which possess their own legal personality but have competences delegated to them by the Community institutions."

⁷ Examples include, among others, Heinemann and Huefner (2004) and Belke and von Schnurbein (2011).

indicate that hiring decisions are generally made on the basis of a candidate's professional qualifications. Still, national background also seems to matter for recruitment. There is evidence that strong national representation at a particular management level is typically associated with similarly strong national presence at the subordinate management layer. Finally, based on Taylor rule estimates to describe the ECB's interest-rate setting behavior, we find that monetary policy decisions are most closely linked to national representation in the core business areas of the ECB.

The remainder of the paper is organized as follows. Section II reviews the relevant literature. Section III provides some institutional background on the European Central Bank, followed by a description of the data in section IV. The heart of the paper is section V which presents our empirical model and the estimation results. Section VI briefly summarizes our findings.

II. Related Literature

Our paper is related to various strands of the literature. There has been extensive work, for instance, on regional representation in a central bank's main decision-making body, the monetary policy committee. Specifically, a number of studies have examined to what extent the presence of regional representatives in the board has affected monetary policy decisions. Reviewing the voting records of individual board members, there seems to be consistent evidence that regional economic conditions help explain dissent voting of regional representatives. Berger and De Haan (2002), for example, argue that economic differences across German states translated into differences in voting behavior in the Bundesbank's Governing Council (Zentralbankrat) in which all German state central banks held voting rights. Similarly, Gildea (1992), Meade and Sheets (2005), and Chappell Jr., McGregor and Vermilyea (2008), among others, find that members of the Federal Open Market Committee in the US are influenced in voting by economic conditions in the regions that they represent. None of these papers has considered regional representation at the staff level.

A sizable body of work is concerned with the design of central bank committees more generally. With reference to regional representation, Berger, Nitsch, and Lybek (2008) find that politically fragmented countries typically have larger monetary policy committees. Berger and Nitsch (2011) show that central banks with required regional representation tend to achieve, on average, lower inflation.

Another relevant strand of the literature focuses on the effects of individuals in organizations. In an interesting study, Bertrand and Schoar (2003) find that corporate managers measurably affect firm behavior and economic performance. Moreover, they identify differences in "styles" across managers which can then be linked to observable managerial characteristics. For instance, Bertrand and Schoar (2003) note that executives from earlier birth cohorts seem to be on average more conservative, while managers with an MBA degree tend to follow more aggressive strategies. For central banks, Göhlmann and Vaubel (2007) find that board members who were previously member of the central bank staff prefer significantly lower inflation rates than former politicians do. In similar fashion, Dreher, Lamla, Lein, and Somogyi (2009) argue that heads of government who are former entrepreneurs are more likely to implement market-liberalizing reforms; Besley, Montalvo and Reynal-Querol (2011) find that more educated political leaders generate higher economic growth. While we are generally sympathetic with the finding that individuals have an effect on organizational outcomes, we deviate from this literature in various respects. For one thing, our focus is exclusively on the regional background of individuals instead of their educational and professional qualifications.⁸ More importantly, we examine a much broader group of individuals. Instead of examining the role of leaders, we cover in our analysis the (various) top management levels of an organization.

In this respect, our approach is also related to an interesting literature, mainly in management science, on the demographic structure of organizations. This literature refrains from the analysis of individual features and emphasizes, in contrast, the compositional aspects of organizations. Pfeffer (1985, p. 79) argues, for instance, that "[t]he difficulty with this [individualistic] approach is its neglect of the interdependence and relationships that are the essential, indeed defining, characteristic of organizations."

III. The ECB

The process of European integration is characterized by a delegation of functions, in a growing number of policy areas, from the national level to the European Union. In many instances this has led to the establishment of new multi- and supranational institutions.⁹ The

⁸ While it would be interesting to also analyze personal characteristics of managers other than nationality, relevant data for such a large and diverse group of people is almost impossible to obtain.

⁹ As a result, there are, in the meantime, many EU institutions, agencies, bodies, commissions and committees. An early example is the EURATOM Supply Agency, founded in 1960 and headquartered in Luxembourg, which is responsible for the regular and equitable supply of nuclear fuels for Community users. A very recent example,

European Central Bank is a particularly important case in point. When the decision was taken to complete the Single Market with a single currency, responsibilities for monetary policy needed to be centralized. As a result, the ECB was created, which forms, along with the national central banks of the euro area member countries, the monetary policy-making authority in the euro area, the Eurosystem.¹⁰

The official agreements about the establishment of the ECB date back to the Treaty on European Union ('Maastricht Treaty'), which was signed in Maastricht on 7 February 1992. The Treaty defined the monetary policy framework in the economic and monetary union; it also contained the Statute of the European System of Central Banks (ESCB) and of the ECB which was attached as a Protocol to the Treaty.¹¹

For the immediate preparatory work, the European Monetary Institute (EMI) was established as a transitory body on 1 January 1994.¹² The objective of the EMI was, among other things, to specify the regulatory, organizational and logistical framework necessary for the ESCB to perform its tasks. Based on the EMI's conceptual design, the ECB was finally established on 1 June 1998, while the EMI went into liquidation. Seven months later, on 1 January 1999, eleven EU member states adopted the euro as their common currency, and the ECB took over responsibility for conducting the single monetary policy in the euro area.

As liquidator of the EMI, the ECB inherited the EMI infrastructure. Scheller (2004, p. 25) argues that the infrastructure included "a body of staff which had been prepared to undertake its duties at the ECB". Most of the EMI staff, however, were on fixed-term contracts, so that the ECB faced effectively no restrictions from the past in setting up

in contrast, is the European Banking Authority, established on 1 January 2011 and headquartered in London, which is a regulatory agency for the financial sector. See http://europa.eu/institutions/inst/index_en.htm for an overview.

¹⁰ Baldwin and Wyplosz (2009, p. 495) note: "Each member [country] still comes equipped with its own central bank, the last remaining vestige of lost monetary sovereignty. No matter how daring the founding fathers of the EMU were, they stopped short of merging the national central banks into a single institution, partly for fear of having to dismiss thousands of employees."

¹¹ Article 105(2) of the Treaty notes: "The basic tasks to be carried out through the ESCB shall be: to define and implement the monetary policy of the Community[...]." Article 106 notes: "(1) The ESCB shall be composed of the ECB and of the national central banks. (2) The ECB shall have legal personality." See http://www.ecb.int/ecb/legal/pdf/maastricht_en.pdf.

¹² The EMI replaced the Committee of Governors of the central banks of the member states, as specified in Article 109f(1) of the Treaty. Operationally, the EMI started with the 28 staff members of the secretariat of the Committee of Governors in Basle.

management and staffing structures.¹³ More importantly, staff size of the ECB has quadrupled after establishment, rising from a permanent staff of 407 on 31 May 1998 to a full-time equivalent number of 1607 at the end of 2010. Over the same period, the number of managerial positions has increased by more than factor three, rising from 45 to 156. In sum, the ECB can be plausibly described as an institution, which had to build up its staff from virtually zero after creation.

For the employment decisions of the ECB, there are no political, administrative or other external constraints. Partly reflecting the institution's independence, Article 36.1 of the Statute of the ESCB and the ECB stipulates that "[t]he Governing Council [of the ECB], on a proposal from the Executive Board, shall lay down the conditions of employment of the staff of the ECB". The conditions were then fixed in the Rules of Procedure at the ECB, adopted by the Governing Council, and turn out to be very general principles. Article 20.2 of the Rules states that "[m]embers of staff shall be selected, appointed and promoted with due regard to the principles of professional qualification, publicity, transparency, equal access and non-discrimination."¹⁴

The selection process was further specified in Administrative Circular 5/2004 which contains detailed rules for recruitment. Apart from the general rule that the ECB appoints only nationals of European Union member states, which seems to be in line with the Staff Regulations of officials of the European Communities¹⁵, this document lays down additional rules on nationality. Specifically, recruitment at the ECB is directed at the broadest possible geographical representation, without imposing a specific national quota. Article 5.4 of the Circular explicitly states: "In the event that candidates have equal qualifications for a position, gender and/or nationality may be used as additional criteria for the selection decision with a view to achieving a balanced representation of gender and/or nationalities."¹⁶ In the

¹³ The Annual Report of the EMI for 1994 states (p. 66): "Members of staff have generally been appointed on three-year fixed-term contracts."; see <http://www.ecb.int/pub/pdf/annrep/ar1994en.pdf>. The view of no contractual restrictions is confirmed in the Annual Report of the ECB for 1998, noting (p. 145): "Most EMI staff contracts were due to expire at the end of 1998. By the date on which these statements were drawn up, 322 permanent staff had transferred to the ECB under new contracts."; see <http://www.ecb.int/pub/pdf/annrep/ar1998en.pdf>.

¹⁴ See http://www.ecb.int/ecb/legal/pdf/l_33819981215en00280033.pdf.

¹⁵ See <http://eur-lex.europa.eu/LexUriServ/site/en/consleg/1962/R/01962R0031-20060701-en.pdf>.

¹⁶ Article 5.2 notes: "Without prejudice to the principle stated above, the selection process shall also be directed to securing the broadest possible geographical basis from among nationals of Member States of the European Union. No nationality quota shall apply and no vacancy shall be reserved for a specific nationality." See <http://www.ecb.int/ecb/jobs/pdf/recruitmentrules.pdf>.

following, we examine national representation at the ECB at various levels of hierarchy in more detail.

IV. Data

At the heart of our paper is a newly compiled panel data set on the nationality of top managers at the European Central Bank. In contrast to previous studies which often focus on a central bank's monetary policy committee, we cover all management layers of the ECB, including the heads of directorates, divisions and sections. Our data set is based on the organizational charts of the ECB. The ECB regularly publishes charts of its organizational structure along with the names (but not the nationalities) of the responsible managers, in the most current version, on its website. We have compiled the charts for the period from 1999 to 2010; the data is on an annual basis and refers to the organizational structure at the beginning of each year.¹⁷

In total, the ECB has appointed, since its establishment, 210 individuals on managerial positions (including deputies). For each individual, we aim to identify the nationality. To do so, we use a variety of sources, including internet search, newswire reports and personal communication. Overall, we were able to confirm the nationality of 190 individuals, except for a few managers of mainly technical and administrative divisions. In our analysis, we deal with those missings in three ways. As our baseline approach, we impose nationality based on the name of the individual. This procedure is relatively straightforward and simple; it also allows us to analyze the full sample. Alternatively, we drop individuals without proper information on nationality. Finally, we focus our analysis on the divisions of key importance for the operations of the ECB (core business areas), thereby reducing the number of individuals with missing nationality.

The top decision-making body of the ECB is the Governing Council, which comprises the Presidents/Governors of the national central banks of the member countries of the euro area and the 6-member Executive Board. Given the politically-determined composition of this body (with members being appointed at the level of heads of state or government), our focus is on the remaining levels of management. The ECB's organizational structure below the Governing Council initially consisted of two management levels; i) the directorates general or directorates, and ii) divisions. After a period of strong growth of the institution, sections were

¹⁷ We are indebted to the ECB's Press Division for the kind provision of missing information.

introduced as third management level in 2003. Table 1 describes the evolution of the number of (filled) management positions at the ECB over time. In addition, there is, for each position, the option of establishing a deputy head. In our empirical analysis, we experiment with both groups of managers, heads only and heads and deputies combined. Fortunately, our results turn out to be generally consistent across samples.

Our central bank data is augmented with data from a number of standard sources, including the IMF's International Financial Statistics, the World Bank's World Development Indicators and OECD statistics. A detailed list of variables and sources is provided in an appendix. Our sample covers the 27 member countries of the European Union. Since 12 of these countries have entered the European Union during the sample period, the panel is unbalanced. We only include countries which, as members of the EU, have subscribed to the capital of the ECB.¹⁸

V. Empirical Analysis

5.1 Who Gets Appointed?

We begin our empirical analysis by examining patterns of national representation in the management of the ECB. Specifically, we aim to identify to what extent the ECB's aim of "broadest possible geographical representation" indeed matters for recruitment. If candidates are mainly selected according to their professional qualifications, we should be able to identify a number of country-specific features that determine the share of top positions filled by national representatives. For instance, the probability of a perfect fit of the applicant's personal profile with the requirements of an open position is higher for nationalities with a large pool of applicants. Since the ECB is likely to receive a larger number of applications from individuals of more populous, economically well-educated and geographically close countries, these countries should be disproportionately strongly represented in the ECB.¹⁹ Broad representation of nationalities, in contrast, would imply that the selection decision for hiring or promotion is largely based on an individual's national background. Consequently, qualifications (and, thus, country features potentially determining the fit of applications)

¹⁸ In practice, the ECB has started recruiting from accession countries more than a year before entry into the European Union (that is, immediately after the treaty of accession to the EU was signed). For our analysis, however, this difference is without relevance.

¹⁹ Alternatively, one could hypothesize that the governments of some countries may have a particularly strong preference for representation at the ECB and thereby provide a special training or preparation for potential candidates from the home country.

become less relevant for appointment; in the extreme, each country has the same share of representatives in the management of the ECB.

To analyze this issue, we run regressions of the following general form:

$$R_{i,t}^{\ell} = \eta_E S_{i,t}^E + \mathbf{x}_{i,t} \boldsymbol{\eta} + \varepsilon_{i,t}^{\ell}, \quad (1)$$

where $R_{i,t}^{\ell}$ is the share of managers in the ECB from country i at management level ℓ in year t , $S_{i,t}^E$ denotes the share of equal representation of each EU member country, $\mathbf{x}_{i,t}$ is a vector of country-specific features, and $\varepsilon_{i,t}^{\ell}$ is a standard error term. Our key variable of interest is the benchmark measure $S_{i,t}^E$, which is defined as $S_{i,t}^E = S_t^E = 1/N_t$, where N_t is the number of EU members countries at time t . To the extent that top positions in the ECB are filled with candidates on a broad geographical basis, we expect that national shares of managers approach this benchmark so that the estimated parameter on this variable takes a statistically significant positive value.²⁰

In our empirical implementation, we estimate variants of (1) separately for individual management levels ℓ , using an (unbalanced) sample of 27 European countries over the period from 1999 to 2010 with a total of 248 observations. As potential country-specific determinants of national representation in the ECB, we consider a country's share in the capital of the ECB (which also proxies for demographic and economic size of a country)²¹, membership in the euro area, the distance of the national capital from the ECB headquarter in Frankfurt, the staff size of the national central bank, and two dummy variables indicating whether the country's official language is German or English, respectively.

Table 2 presents the results. Each column tabulates the result of a separate regression. We start our investigation by examining country shares at individual management levels (columns 1-3). Next, we explore aggregate shares of country representation at the ECB

²⁰ We use the share in EU countries (rather than the share in euro area countries) since citizens of all EU member states are eligible for employment with the ECB; see <http://www.ecb.int/ecb/jobs/apply/html/index.en.html>. In our analysis, we control for the effect of euro area membership.

²¹ Capital shares are determined (and regularly recalculated) based on a country's total population and GDP (in equal weightings); see <http://www.ecb.int/ecb/orga/capital/html/index.en.html>.

(columns 4-5), using both the total number of managers across the three management levels as well as the level-weighted number of managers for aggregation.²² Finally, for completeness, we also provide results for national representation in the Governing Council of the ECB (columns 6-7).

The key parameter of interest to us is η_E , the estimated parameter on the benchmark share of equal representation. As shown, the point estimate is typically small in magnitude and statistically indistinguishable from zero, indicating that national shares of managers differ sizably across countries. Moreover, shares seem to deviate from equality in systematic fashion; a number of parameters on country-specific features turn out to be sensible and precisely estimated. Also, the regressions fit the data reasonably well, explaining more than three-fourths of the variation in national representation. In sum, the estimates strongly indicate that recruitment at the management level of the ECB is dominated by factors other than equal geographical representation.

Reviewing the estimated parameters in more detail, several results are worth emphasizing. A first observation is that, at almost all management levels of the ECB (including the Governing Council), country size matters for representation: Countries with a larger capital share in the ECB and (often) a larger staff size of the national central bank tend to have more representatives in the management of the ECB. A reasonable explanation for this finding may be, as already mentioned before, that in these countries there seems to be a greater supply of able central bankers.

In contrast, only for top management positions at the ECB, membership in the euro area is significantly (positively) associated with national representation. While euro area membership is a precondition for representation in the decision-making Governing Council, the association becomes weaker as the management level declines. The euro area dummy even loses significance for division and section heads, possibly reflecting the ECB's aspiration to document its EU-wide recruitment strategy in the organizational chart; this approach seems to be most easily possible and justifiable for less influential management positions.

²² We assign a weight of 1 for directorates, 0.5 for divisions and 0.25 for sections. To avoid losing observations, weighted aggregates for the period up to 2004 are calculated based on directorates and divisions only.

There are similarly mixed results for other country features. It seems easier to find and attract promising candidates for the filling of positions at lower management levels if they live already close to Frankfurt (Germany), the location of the headquarter of the ECB, and/or speak German. Also, being a native speaker of English is especially important at the section head level. Interestingly, none of these characteristics is of relevance at the top (directorate) level, a (non-)result that is line with the hypothesis that the director position is highly competitive, allowing to recruit qualified candidates from a broad range of countries.

We have performed extensive robustness checks. To economize on space, Table 3 presents a subset of the results of those exercises, tabulating estimates for the specification with the total number of representatives only. We modify our sample along various dimensions. In the first column, we examine a sample when individuals for which we have no confirmed information on nationality are dropped. Our baseline results remain basically unchanged for this perturbation. Next, we add information on deputy heads (in addition to department heads) to our count measure of national managers, again producing essentially similar results. In another exercise, we focus exclusively on managers in the ECB's core business areas. These functional units are of particular interest and relevance as they are directly involved in the formulation and implementation of the ECB's monetary policy.²³ Interestingly, for the core areas, membership in the euro area seems to become an important precondition for appointment. In contrast, knowledge of the German language is less relevant than before. A plausible explanation may be that it is especially in supporting business areas (such as infrastructure), where interactions with local businesses (and, thus, the ability to properly communicate with locals) are particularly important. Again, none of our results are changed when we additionally take ECB managers with deputy function into consideration. Finally, our baseline results are basically confirmed when Germany is dropped from the sample. Overall, our finding that the management structure of the ECB deviates from the plain principle of broad geographical representation turns out to be reasonably robust.

5.2 Does Presence in Top Management Matter for Appointment?

²³ The ECB has defined as its core business areas: Banknotes; Economics; Financial Stability; International and European Relations; Legal Services; Market Operations; Payments and Market Infrastructure; Research; Statistics; the Target2-Securities Program; and the ECB Permanent Representation in Washington, DC. Supporting business areas are: Counsel to the Executive Board; Administration; Communications; Human Resources, Budget and Organization; Information Systems; Internal Audit and Secretariat and Language Services. See http://www.ecb.int/ecb/educational/facts/orga/html/or_005.en.html.

In a next step, we explore the possible existence of national networks in the ECB. Specifically, we analyze whether national presence at top management levels also affects national representation at lower management levels. It could be argued, for instance, that, after a change in the ECB's top management, nationals of other countries are targeted for lower-level positions in order to achieve broad geographical representation within a given business area; that is, there should be a gradual replacement at lower management levels (to the extent individual contracts allow for such behavior²⁴). Alternatively, nationals at the top level may act as a door-opener for fellow nationals. Specifically, given that in the day-to-day business, personal interaction is often crucially important, there may be a tendency to select subordinates that share the same language and culture.

To analyze these issues empirically, we augment our baseline regression framework by measures of national presence in the top management. That is, we estimate variants of the following equation:

$$R_{i,t}^{\ell} = \kappa_P P_{i,t} + \kappa_{VP} VP_{i,t} + \kappa_{EB} EB_{i,t} + \kappa_{\ell'} R_{i,t}^{\ell'} + \eta_E S_{i,t}^E + \mathbf{x}_{i,t} \boldsymbol{\eta} + \varepsilon_{i,t}^{\ell} \quad (2)$$

where P is a binary dummy variable that takes the value of one if the President of the ECB is from country i , and a zero otherwise, VP and EB are analogous variables for the Vice President of the ECB and other Executive Board members, respectively, and $R_{i,t}^{\ell'}$ is the share of national representation at management level ℓ' above the level of the regressand (ℓ).

Estimation results are tabulated in Table 4. As before, the management level is varied as dependent variable across columns, beginning with the most senior (directorate) level on the left of the table. Also, we include the full set of country features \mathbf{x} in the regressions, but, for the sake of brevity, only the estimates of κ are reported. The results in the first column indicate that individuals who share the nationality of the president are more likely to be appointed as head of directorate/directorate general, holding constant other country-specific determinants for representation in the top management of the ECB. Taken at face value, the point estimate of 0.07 implies that the share of directors at the ECB is, on average,

²⁴ Changes in the responsibilities of senior managers in the ECB are indeed "in accordance with its policy to promote mobility within the ECB, which is aimed at strengthening the efficiency and effectiveness of the organization"; see http://www.ecb.int/press/pr/date/2006/html/pr060803_2.en.html.

7 percentage points larger for the home country of the President than for other countries. As noted before, however, this observation may be not particularly surprising, given that there are some sensitive positions (such as head of communications) where cultural differences between individuals should be avoided. For the Vice President, in contrast, the (negative) coefficient indicates that fellow nationals face a disproportionately low probability of appointment at the top management (directorate) level.

The second column presents analogous results for the second management level, heads of divisions. Except for a now moderate negative effect of Vice Presidency, none of the variables for national presence in the Executive Board of the ECB has a measurable impact on the number of representatives at this level. However, when we extend our analysis to also include the number of representatives at the top management level (column 3), the coefficient on this variable takes a significantly positive sign, implying that strong national presence at the directorate level is associated with disproportionately large presence at the division level.

The observation of national network effects between adjacent management layers is confirmed at the lowest ECB management level, sections. Results for alternative specifications are tabulated in the final four columns on the right of Table 4. While the results for the various levels of senior management are mixed, with slight overrepresentation of the home country of the Vice President among section heads and disproportionately low presence of the nationality of the President and other Executive Board members, the national presence at the division level (i.e., the direct supervisor) has a strong positive effect on representation at the section level. In sum, our findings clearly suggest that presence in the top management has a positive effect on national representation at lower management levels, indicating the existence of national network effects.

We have checked the sensitivity of our results along various lines. Table 5 reports the results of two modifications to our baseline framework, tabulating for each modification separate estimates for the three management levels of the ECB. As before, we begin by extending our sample to additionally take account of the nationality of deputy heads. We also restrict our sample to include only the core business areas of the ECB. For none of these perturbations, however, there is a notable change in our results. There are clear indications of a positive link between national presence in neighboring management levels.

5.3 Monetary Policy Effects of National Representation

Does national representation in the ECB affect monetary policy decision-making? Previous studies have strongly focused on the national distribution of votes in the ECB decision-making body, the Governing Council.²⁵ We examine the association between national representation in the ECB's top management and monetary policy decision-making.

To analyze this issue, we estimate Taylor-type interest rate rules that are typically found to describe actual monetary policy reasonably well. Taylor rules specify the nominal interest rate as function of inflation and the output gap. For the ECB, whose monetary policy is targeted at the euro area, the variables of interest for policy-making are weighted averages of national data from euro area member countries. Therefore, we compute euro area aggregates and estimate corresponding Taylor rules, based on alternative weighting schemes for national data, exploring the empirical fit of these rules.

Our baseline specification follows English, Nelson and Sack (2003), who use a Taylor rule specification that allows for both partial adjustment of the actual to the target interest rate and for serial correlation in the error term. These two features are considered as relevant in explaining deviations of the actual interest rate from the rate implied by a standard (static) Taylor rule.²⁶

The full model is made up of three equations. Consider a forward-looking Taylor rule in which the target interest rate i_t^* is described as a function of the deviation of future expected inflation π_t^e from its target $\bar{\pi}_t$ and the change in the output gap, i.e., the deviation of expected output growth $\Delta \ln y_t^e$ from (expected) growth of potential output $\Delta \ln \bar{y}_t$:²⁷

$$i_t^* = \alpha + \beta(\pi_t^e - \bar{\pi}_t) + \gamma(\Delta \ln y_t^e - \Delta \ln \bar{y}_t), \quad (3)$$

²⁵ For instance, Berger and Mueller (2007) argue that the pattern of over- and under-representation of member countries in the ECB Council might be extreme.

²⁶ For recent applications of this approach, see Gorter, Jacobs and de Haan (2008) and Sturm and de Haan (2011).

²⁷ In the empirical literature, it has become standard practice to use the change in the output gap rather than its level. Walsh (2003) advocates the use of such a modified Taylor rule in the presence of uncertainty about the output gap. For a discussion of the advantages of using growth rates rather than levels, see Sturm and Wollmershäuser (2008, p. 4).

so that α denotes the neutral nominal interest rate, i.e., the interest rate, when inflation is at its target and output growth is equal to trend growth.

In practice, it seems reasonable to assume that the actual interest rate i is adjusted only gradually to its target level so that:

$$i_t = \rho i_{t-1} + (1 - \rho)i_t^* + v_t, \quad (4)$$

where $(1 - \rho)$ is the speed of adjustment parameter. Finally, the error term is allowed to exhibit first order serial correlation:

$$v_t = \delta v_{t-1} + \varepsilon_t. \quad (5)$$

Using then a Cochrane-Orcutt transformation and rewriting the equation in first differences, we obtain (see English, Nelson, and Sack, 2003):

$$\Delta i_t = \rho \Delta i_t^* + \rho(1 - \delta)(i_{t-1}^* - i_{t-1}) + \rho \delta \Delta i_{t-1} + \varepsilon_t \quad (6)$$

which is our benchmark empirical model.

In our empirical implementation, we use the ECB's main refinancing rate as dependent variable. The main refinancing rate is the key interest rate, set by the Governing Council, and assumed to reflect directly the ECB's monetary policy setting behavior. In extensive robustness checks, we also experiment with market-based interest rates, such as the Eonia and 3-month Euribor.²⁸

We estimate our model using monthly data for the period from January 1999 to June 2008.²⁹ Data on expected inflation and output growth are obtained from Consensus Economics. Following the literature, we use the professional forecasts of inflation and output growth in the current and the following year to construct monthly measures of real-time

²⁸ Since the estimates are qualitatively identical, we do not report the results.

²⁹ Extending the sample to also include more recent months would bias the Taylor rule estimate towards the output gap at the expense of the inflation rate (which becomes insignificant). This result is not too surprising, given that the ECB interest rates have been at record lows during times of financial crisis.

expectations for the key macroeconomic variables.³⁰ The series for the euro area are then obtained as weighted averages of the country values, i.e.,

$$\pi_{t,m}^e = \sum_{i=1}^{N_t} \omega_{i,t} \pi_{i,t,m}^e \quad \text{and} \quad y_{t,m}^e = \sum_{i=1}^{N_t} \omega_{i,t} \Delta \ln y_{i,t,m}^e, \quad (7)$$

where, in our benchmark specification, the weight $\omega_{i,t}$ is country i 's share in the real GDP of the euro area in year t , and N_t is the (time-variant) number of euro area member countries.³¹ Finally, in order to quantify macroeconomic conditions as deviation from medium-term targets, we set target inflation to 2%, based on the ECB's definition of price stability, and assume potential output growth of 2.25%, using the mid-point of the interval given by the ECB.

Table 6 presents baseline estimation results for specifications of the Taylor rule when a country's share of euro area real GDP is used as weight ω_i .³² We proceed stepwise. The first column reports parameter estimates for the full model with no restrictions. As shown, it turns out that the AR parameter δ is insignificant in our sample, which may be explained by the smooth time series properties of the main refinancing rate. In the next column, therefore, we tabulate results for a specification when $\delta = 0$. For this modification, the parameter estimates slightly decrease in magnitude, but the overall results remain essentially unchanged. Most notably, the point estimates of the parameters for expected inflation and the change in the output gap again turn out to be virtually identical. The estimates imply that an increase in expected inflation (the expected change in the output gap) by 1 percentage point induces an increase in the ECB's main refinancing rate by 1.9 percent (that is, the expected real interest

³⁰ More specifically, we compute the weighted average of the Consensus forecasts for the current year (c) and the following year (f). Expected inflation for country i in year t , month m is then given by $\pi_{i,t,m}^e = \frac{13-m}{12} \pi_{i,t,m}^c + \frac{m-1}{12} \pi_{i,t,m}^f$, where $\pi_{i,t,m}^c$ and $\pi_{i,t,m}^f$ denote Consensus forecasts for country i in year t , month m , for the rate of inflation (in percent) in the current and following year, respectively. An analogous procedure is used to compute expected output growth, where $\Delta \ln y_{i,t,m}^e = [\frac{13-m}{12} \Delta \ln y_{i,t,m}^c + \frac{m-1}{12} \Delta \ln y_{i,t,m}^f] \times 100$, with $\Delta \ln y_{i,t,m}^c$ and $\Delta \ln y_{i,t,m}^f$ denoting Consensus forecasts for GDP growth (in percent) in the current and the following year, respectively; see also Gorter, Jacobs and de Haan (2008).

³¹ All shares are defined with respect to the current size of euro area at time t (that is, the shares always sum to one). Cyprus, Malta, and Luxembourg are dropped from our sample, because survey data from Consensus Economics is not available.

³² Results turn out to be virtually identical when a country's capital subscription key in the ECB is used.

rate increases after an upsurge in inflation expectations).³³ Also, interest rates display a high degree of persistence; the point estimate of ρ indicates that about 10 percent of the difference between the actual rate and the target rate is closed each month. Finally, the empirical fit of the regression is satisfactory with an R^2 of 0.231. Overall, we consider the (restricted) model in the second column of Table 6 as our preferred specification of the Taylor rule.

In column three, we re-estimate the model by two stages least squares (2SLS), using the first and second time lag of the explanatory variable as instruments, to address potential concerns of endogeneity. For this estimation technique, the point estimates of the response parameters are virtually unchanged and a Hausman-type test cannot reject the null hypothesis that the least squares estimates and the 2SLS estimates are identical.

Finally, we provide, for completeness, an OLS estimation of our preferred specification for a shorter subsample of our data, covering the period from 2004 to 2008. In 2004, after years of strong growth in staff size, the ECB changed its management structure by introducing sections as a new management layer. The sample size is reduced by more than one-half and the empirical fit of our regression decreases sizably. As shown in the last column of Table 6, the R^2 drops to 0.122 for this shorter period.

To identify possible effects of the national composition of the ECB management on decision-making, we next explore whether other specifications of the Taylor rule better describe ECB monetary policy. Specifically, we vary the weights $\omega_{i,t}$ in the derivation of the euro area aggregates for output growth and inflation gaps. If monetary policy is directed more strongly towards the macroeconomic conditions in countries that are well represented in the ECB management, we would expect that Taylor rule specifications that use national representation as weights to aggregate national data provide a superior empirical fit than the default specification based on economic weights. Our benchmark values for the R^2 from Table 6 are 0.231 for the full period (1999-2008) and 0.122 for the shorter sample (2004-2008).

Table 7 reports the results. We begin with the estimates for the top management layer of the ECB, directorates/directorates general. As shown in column 1, the point estimates of

³³ The finding of symmetric weighting of inflation and economic growth in the ECB's monetary policy is a remarkable result, although not new to the literature. Sturm and Wollmershäuser (2008, p. 13) conclude that "the ECB takes movements in real variables at least as serious as movements in inflation".

the coefficients slightly differ from the regression based on economic weights, but generally remain sensibly and precisely estimated. The key statistic of interest, however, is the R^2 , which gives the amount of variation in the interest rate that is explained by the estimated Taylor rule. With an R^2 of 0.184, the empirical fit of the regression falls notably when national representation at the directorates level of the ECB is used to aggregate national macroeconomic data.

The next two columns tabulate analogous results for the other two management layers of the ECB. While the findings for divisions display a much better empirical fit, the R^2 is still below the baseline regression. In contrast, with an R^2 of 0.230, the specification based on the national weight of ECB section heads (for the period 2004-2008, for which data on representation at the section level is available) performs dramatically better than the specification based on national economic weights with an R^2 of 0.122. National representation at the sections level appears to have an effect on the formulation of ECB monetary policy.

Aggregated measures of national representation in the ECB management (which also cover sections after their establishment in 2004) confirm this finding. When a country's share in the total number of managers is used as weight, the empirical fit of the regression is slightly better than in the baseline version. The effect is lowered, however, once the number of managers in a given year is weighted by the respective management layer, with sections receiving the smallest weight.

Finally, the three columns on the right of Table 7 tabulate the results for various groups of the Governing Council. Reassuringly, given that Council members are expected to make decisions exclusively based on information for the euro area aggregate, national representation in the Council has no measurable effect on the appropriateness of ECB monetary policy for individual countries as measured by the empirical fit of a Taylor rule specification; the R^2 decreases from 0.23 to about 0.20.

Table 8 presents results for two sets of sensitivity checks. As before, we experiment with additionally taking into account the nationality of deputies when computing our measure of national representation at the management of the ECB. The results are tabulated in the first four columns of the table, again varying across management layers. For this modification, the

estimated parameters turn out to be slightly larger in magnitude, but our conclusions remain largely unchanged.

Next, we examine national representation in the management of the core business areas of the ECB. Regression results are shown in the last four columns of Table 8. The findings strongly indicate that national presence in the management of the ECB's key business units is associated with an interest rate-setting policy of the ECB that better suits the economic conditions (and, thus, national interests) of these countries. For both, divisions and sections, the empirical fit of the regression improves markedly, a finding that is replicated for the total number of managers. On average, we observe an increase in the R^2 of about 2 percentage points compared with the results derived from overall national representation in the ECB's management.

While our discussion is mainly focused on the results for the full sample period from 1999 to 2008, it should be noted that our findings become even stronger if we restrict our sample to the period after the appointment of section heads in the ECB (for which the empirical fit in the baseline regression was found to be much weaker). For instance, in unreported results, the R^2 of the Taylor rule using total representation in the management of the ECB (in the core business areas only) for the short sample period from 2004:2 to 2008:6 is 0.196 (0.228), compared with an R^2 of 0.122 in the default specification using economic weights. In sum, there is convincing evidence that the empirical fit of the Taylor rule based on national representation weights in the management of the ECB clearly exceeds the fit of the rule that is observed for euro area aggregates based on economic weights.

VI. Conclusions

Multinational institutions face an important trade-off when hiring personnel. As in most organizations, hiring decisions are mainly based on a candidate's professional qualifications. In addition, however, multinational institutions often aim for broad national representation, for various reasons. Potential benefits include greater diversity of personal backgrounds and access to local knowledge which may help implement policies (potentially leading to broader acceptance). At the same time, however, cultural issues may also become a hindrance to organizational success. Possible costs include forgoing talent for geographic variety, network effects and a national bias in decision-making.

Looking at the European Central Bank, we show that nationality is indeed relevant for both hiring and decision-making. We identify various country-specific features that determine national representation in the top management of the ECB. Further, there is evidence for the existence of national networks between adjacent management layers. Finally, monetary policy decisions seem to be linked to national representation in the core business areas of the ECB.

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Table 1: The ECB – A Growing Institution

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Directorates, Direct's General	18	20	20	21	21	21	20	20	20	20	20	19
Divisions	34	49	51	52	53	51	52	52	52	52	54	55
Sections	–	–	–	–	–	33	32	36	37	41	49	49
additional information:												
National Central Banks¹	11	11	12	12	12	12	12	12	13	15	16	16
Executive Board	6	6	6	6	6	6	6	6	6	6	6	6
ECB Staff²	534	732	941	1,043	1,109	1,217	1,314	1,360	1,367 ³	1,478 ³	1,536 ³	1,563 ³

Notes: The table lists the number of managers at different ECB management levels (no deputies). The data refer to the beginning of the year.

¹ Governors of national central banks of euro area member countries who are automatically member of the ECB Governing Council

² End of previous year

³ Full-time equivalent positions

Sources: Own compilations; various issues of the annual report of the ECB.

Table 2: Who Gets Appointed?

	Directorates, Direct's General	Divisions	Sections	Total	Weighted	Executive Board	Governing Council
Equal Share	-0.080 (0.386)	0.127 (0.236)	0.665 [#] (0.356)	0.177 (0.245)	0.098 (0.231)	-0.400 (0.447)	0.116 (0.147)
Capital Share	0.372 (0.229)	0.506** (0.154)	0.515* (0.214)	0.465** (0.140)	0.444** (0.152)	0.736* (0.283)	0.235* (0.090)
Euro Area Member	0.027* (0.011)	0.008 (0.007)	-0.008 (0.011)	0.007 (0.007)	0.013 [#] (0.007)	0.060** (0.015)	0.071** (0.005)
Ln Distance	-0.020 [#] (0.010)	-0.016* (0.007)	-0.017 [#] (0.010)	-0.017* (0.007)	-0.018* (0.007)	0.009 (0.012)	0.002 (0.004)
Border	0.017 (0.015)	-0.013 (0.012)	-0.039 [#] (0.022)	-0.011 (0.011)	-0.004 (0.010)	-0.014 (0.021)	-0.006 (0.007)
German	-0.004 (0.011)	0.060* (0.026)	0.100 [#] (0.054)	0.051 [#] (0.027)	0.038 [#] (0.021)	0.026 (0.031)	0.007 (0.010)
English	0.005 (0.016)	0.020 (0.012)	0.039* (0.016)	0.023** (0.007)	0.017* (0.007)	-0.064** (0.016)	-0.022** (0.006)
Ln Staff NCB	0.020 [#] (0.012)	0.016* (0.008)	0.015 (0.010)	0.017* (0.008)	0.018* (0.008)	-0.008 (0.012)	-0.003 (0.004)
Obs	248	248	173	248	248	248	248
Adj. R²	0.80	0.90	0.80	0.90	0.90	0.69	0.93

Notes: OLS estimation. Dependent variable is the share of representatives from country *i* at time *t* at the ECB management level tabulated in the first line. Robust standard errors (clustering by country) in parentheses. **, *, and # denote significant at the 1%, 5% and 10% level, respectively.

Table 3: Who Gets Appointed? Robustness Checks

Sample	Confirmed nationality only	With deputies	Core business areas only	Core business areas with deputies	Germany dropped
Equal Share	0.164 (0.252)	0.129 (0.236)	0.131 (0.316)	0.067 (0.316)	0.168 (0.187)
Capital Share	0.464** (0.139)	0.477** (0.139)	0.419* (0.179)	0.410* (0.175)	0.507** (0.113)
Euro Area Member	0.010 (0.007)	0.009 (0.007)	0.025** (0.009)	0.024** (0.008)	0.015 [#] (0.009)
Ln Distance	-0.016* (0.007)	-0.017* (0.007)	-0.018* (0.007)	-0.019* (0.008)	-0.013 [#] (0.007)
Border	-0.015 (0.012)	-0.008 (0.010)	-0.024 (0.015)	-0.018 (0.012)	0.008 (0.013)
German	0.057* (0.027)	0.045 [#] (0.023)	0.013 (0.030)	0.013 (0.024)	0.008 (0.013)
English	0.016 (0.010)	0.020* (0.008)	0.005 (0.014)	0.005 (0.013)	0.032** (0.009)
Ln Staff NCB	0.016* (0.008)	0.017* (0.008)	0.018* (0.008)	0.020* (0.009)	0.012 (0.008)
Obs	248	248	248	248	236
Adj. R²	0.90	0.91	0.83	0.86	0.89

Notes: OLS estimation. Dependent variable is the (total) share of representatives from country *i* at time *t* in the management of the ECB. Robust standard errors (clustering by country) in parentheses. **, *, and # denote significant at the 1%, 5% and 10% level, respectively. Year effects included but not reported.

Table 4: Does Presence in Top Management Matter?

	Directorates, Direct's General	Divisions	Divisions	Sections	Sections	Sections	Sections
President	0.074** (0.023)	-0.008 (0.010)	-0.028* (0.010)	-0.102** (0.022)	-0.101** (0.024)	-0.074** (0.015)	-0.048** (0.016)
Vice President	-0.047** (0.014)	-0.019* (0.008)	-0.006 (0.007)	0.014 (0.012)	0.013 (0.014)	0.029** (0.008)	0.017** (0.006)
Other Member Executive Board	-0.001 (0.011)	0.002 (0.011)	0.002 (0.009)	-0.097** (0.034)	-0.097** (0.034)	-0.073** (0.032)	-0.065* (0.027)
Directorates, Direct's General			0.273** (0.081)		-0.030 (0.119)		-0.352** (0.092)
Division						0.696** (0.394)	0.945** (0.203)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	248	248	248	173	173	173	173
Adj. R²	0.84	0.90	0.92	0.86	0.86	0.90	0.92

Notes: OLS estimation. Dependent variable is the share of representatives from country i at time t at the ECB management level tabulated in the first line. Robust standard errors (clustering by country) in parentheses. **, *, and # denote significant at the 1%, 5% and 10% level, respectively. Controls included but not reported: equal distribution share, ECB capital key subscription share, euro area member dummy, log distance from Frankfurt, common border with Germany dummy, German language dummy, English language dummy, log staff size national central bank.

Table 5: Does Presence in Top Management Matter? Robustness Checks

	With deputies			Core business areas only		
	Direct's, Direct's General	Divisions	Sections	Direct's, Direct's General	Divisions	Sections
President	0.068** (0.022)	-0.025* (0.011)	-0.066* (0.026)	0.054** (0.017)	-0.028 (0.018)	0.006 (0.021)
Vice President	-0.037* (0.015)	0.002 (0.010)	0.009 (0.008)	-0.060** (0.014)	-0.007 (0.012)	0.025* (0.010)
Other Member Executive Board	-0.003 (0.010)	-0.005 (0.010)	-0.066# (0.037)	0.037 (0.021)	0.021 (0.019)	-0.083# (0.042)
Directorates, Direct's General		0.325** (0.079)	-0.147 (0.167)		0.264** (0.072)	-0.511** (0.165)
Division			0.693# (0.341)			1.195** (0.261)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs	248	248	248	248	248	248
Adj. R²	0.87	0.93	0.88	0.79	0.85	0.62

Notes: OLS estimation. Dependent variable is the number of representatives from country i at time t at the ECB management level tabulated in the second line. Robust standard errors (clustering by country) in parentheses. **, *, and # denote significant at the 1%, 5% and 10% level, respectively. Controls included but not reported: equal distribution share, ECB capital key subscription share, euro area member dummy, log distance from Frankfurt, common border with Germany dummy, German language dummy, English language dummy, log staff size national central bank. Year effects included but not reported.

Table 6: Taylor Rule Estimates in the Euro Area

Sample	1999-2008			2004-2008
Estimation method	OLS	OLS	2SLS	OLS
Constant	3.623** (0.199)	3.615** (0.195)	3.629** (0.220)	4.663** (0.700)
Inflation gap	1.977** (0.508)	1.881** (0.476)	1.933** (0.586)	3.193** (0.751)
Output gap	1.923** (0.314)	1.891** (0.312)	1.947** (0.371)	3.861** (1.223)
Speed of adjustment	0.900** (0.029)	0.897** (0.030)	0.907** (0.031)	0.945** (0.034)
AR parameter	-0.111 (0.056)			
Obs	112	113	112	53
R²	0.244	0.231	0.211	0.122

Notes: Dependent variable is the (change in the) main refinancing rate. Heteroscedasticity and autocorrelation robust standard errors in parentheses. ** denotes significant at the 1% level.

Table 7: Does Representation Affect Monetary Policy? Evidence from Taylor Rules

	Directorates, Direct's General	Divisions	Sections	Total	Weighted	National Central Banks	Executive Board	Governing Council
Constant	3.573** (0.248)	3.397** (0.155)	2.869** (0.075)	3.351** (0.149)	3.421** (0.168)	2.317** (0.137)	2.639** (0.198)	2.390** (0.149)
Inflation gap	1.264 (0.858)	1.949** (0.441)	2.678** (0.334)	1.845** (0.447)	1.777** (0.514)	1.589** (0.435)	1.604** (0.636)	1.620** (0.463)
Output gap	1.705** (0.441)	1.414** (0.237)	2.362** (0.338)	1.496** (0.252)	1.504** (0.273)	1.552** (0.256)	2.405** (0.510)	1.802** (0.300)
Speed of adjustment	0.908** (0.036)	0.883** (0.032)	0.895** (0.026)	0.886** (0.032)	0.887** (0.033)	0.876** (0.042)	0.921** (0.025)	0.889** (0.034)
Obs	113	113	53	113	113	113	113	113
R²	0.184	0.229	0.230	0.235	0.220	0.201	0.199	0.208

Notes: OLS estimation. Dependent variable is the (change in the) main refinancing rate. Heteroscedasticity and autocorrelation robust standard errors in parentheses. ** and * denote significant at the 1% and 5 % level, respectively.

Table 8: Does Representation Affect Monetary Policy? Robustness Checks

	With deputies				Core business areas only			
	Directorates, Direct's General	Divisions	Sections	Total	Directorates, Direct's General	Divisions	Sections	Total
Constant	3.694** (0.269)	3.402** (0.152)	2.869** (0.075)	3.421** (0.159)	3.460** (0.287)	3.194** (0.120)	2.356** (0.071)	3.129** (0.121)
Inflation gap	1.611* (0.865)	1.909** (0.414)	2.678** (0.334)	1.914** (0.457)	1.052 (1.155)	1.665** (0.357)	2.522** (0.268)	1.707** (0.391)
Output gap	1.842** (0.446)	1.392** (0.227)	2.362** (0.338)	1.541** (0.264)	1.732** (0.541)	1.494** (0.217)	2.316** (0.288)	1.557** (0.239)
Speed of adjustment	0.912** (0.032)	0.880** (0.033)	0.895** (0.026)	0.888** (0.032)	0.918** (0.038)	0.878** (0.031)	0.883** (0.024)	0.882** (0.031)
Obs	113	113	53	113	113	113	53	113
R²	0.184	0.229	0.230	0.232	0.159	0.250	0.257	0.248

Notes: OLS estimation. Dependent variable is the (change in the) main refinancing rate. Heteroscedasticity and autocorrelation robust standard errors in parentheses. ** and * denote significant at the 1% and 5 % level, respectively.

Appendix: Data Description and Sources

Variable	Description	Source	Obs.	Mean	Std. Dev.	Min.	Max.
Directorates, Direct's General	Country share of ECB directors	Own computation	248	0.048	0.068	0	0.250
Divisions	Country share of ECB division heads	Own computation	248	0.048	0.069	0	0.346
Sections	Country share of ECB section heads	Own computation	173	0.048	0.075	0	0.408
Total	Country share of ECB managers (total number of heads of directorate, division and section)	Own computation	248	0.048	0.065	0	0.350
Weighted	Country share of ECB managers (weighted number of heads of directorate [weight of 1], division [0.5] and section [0.25])	Own computation	248	0.048	0.064	0	0.315
Executive Board	Country share of Executive Board members	Own computation	248	0.048	0.076	0	0.167
Governing Council	Country share of Governing Council members	Own computation	248	0.048	0.044	0	0.118
Equal Share	1/Number of EU member countries	Own computation	248	0.048	0.014	0.037	0.067
Capital Share	ECB Capital Subscription Share	ECB	248	0.048	0.062	0.001	0.245
Euro Area Member	Dummy = 1 if country is member of the euro area	Own computation	248	0.621	0.486	0	1
Distance	Distance of national capital from Frankfurt in km (Germany: 150 km)	Own computation	248	970.5	580.7	150	2596
Border	Dummy = 1 if country has common border with Germany	Own computation	248	0.339	0.474	0	1
German	Dummy = 1 if German is official language	Own computation	248	0.097	0.296	0	1
English	Dummy = 1 if English is official language	Own computation	248	0.145	0.353	0	1
Staff NCB	Log staff size of national central bank	Central Bank Directory	248	2792.7	4001.9	140	16077
Main Refinancing Rate	Main refinancing rate	ECB	114	3.066	0.896	2	4.75
Inflation Gap	Deviation of professional forecast of CPI inflation from inflation target of 2%	Consensus Economics	114	-0.104	0.279	-0.851	0.74
Output Gap	Deviation of professional forecast of GDP growth from potential growth of 2.25%	Consensus Economics	114	-0.15	0.534	-0.984	1.086