Discussion Papers
Statistics Norway
Research department
No. 687
March 2012

Statistics Norway

Statistisk sentralbyrå

Ådne Cappelen and Terje Skjerpen

Immigration to Norway 1969-2010

Effects of policies and EEA membership

Discussion Papers No. 687, March 2012
Statistics Norway, Research Department

Ådne Cappelen and Terje Skjerpen

Immigration to Norway 1969-2010
Effects of policies and EEA membership

Abstract:
We examine how changes to regulations and the economic conditions have influenced gross immigration to Norway from, in principle, all countries in the world during 1969– 2010. In line with existing studies of immigration we find that economic factors were important for immigration to Norway. Income differences between Norway and other countries have the expected impact, as do changes in income distributions. The labour market situation has also been important in that lower unemployment in Norway has resulted in higher immigration and higher unemployment in the country of origin has led to higher emigration to Norway. We find that immigration policies have largely had the expected effects. One example is the 1975 'immigration halt' that did have a strong and long lasting effect on total immigration to Norway. Further tightening of the immigration regulations that came in 1977 also reduced immigration, while the more liberal policies introduced in 1981 contributed to higher immigration. From 2000 to 2010 several changes linked to the enlargement of EU influenced immigration to Norway. Norway's membership in the European Economic Area (EEA) in 1994, and in the Schengen-area in 2001 resulted in higher immigration while the 2004 and 2007 EU enlargements also increased labour immigration to Norway substantially.

Keywords: Immigration, Immigration policies, Incentive variables

JEL classification: J11, J15

Acknowledgements: We would like to thank Norwegian Directorate of Immigration (UDI) for financial support, Jørgen Ouren for help with the data and Taryn A. Galloway, Eivind Hoffmann (at the UDI), Arvid Raknerud and Lars Østby for useful comments.

Address: Terje Skjerpen, Statistics Norway, Research Department, P.O. Box 8131, Dep. N-0033 Oslo Norway. E-mail: terje.skjerpen@ssb.no

Ådne Cappelen, Statistics Norway, Research Department, P.O. Box 8131, Dep. N-0033 Oslo Norway. E-mail: cap@ssb.no

Discussion Papers comprise research papers intended for international journals or books. A preprint of a Discussion Paper may be longer and more elaborate than a standard journal article, as it may include intermediate calculations and background material etc.

Abstracts with downloadable Discussion Papers
in PDF are available on the Internet:
http://www.ssb.no
http://ideas.repec.org/s/ssb/dispap.html

For printed Discussion Papers contact:
Statistics Norway
Telephone: +47 62 88 55 00
E-mail: Salg-abonnement@ssb.no

ISSN 0809-733X
Print: Statistics Norway

Sammendrag

Innvandringen til Norge har økt gradvis og netto innvandringen har gjennomgående vært positiv og økende siden 1970. Etter utvidelsen av EU i 2004 har innvandringen skutt fart og har svingt rundt 70 000 i senere år. På 1970-tallet iverksatte myndighetene tiltak for å dempe innvandringen til Norge. På 1980-tallet var det en viss liberalisering igjen av politikken. Siden 1994 har endringen i innvandringen blitt sterkt påvirket av Norges tilknytning til EU. I denne studien analyserer vi hvordan ulike politiske tiltak og endringer i økonomiske omstendigheter har påvirket innvandringen til Norge. Tall for brutto innvandring fra i prinsippet alle land i verden til Norge fra 1969 til 2010 studeres.

I økonomisk forskning om migrasjonsstrømmer finnes det en standardmodell for individers flyttebeslutninger. Modellen vektlegger økonomiske forhold i hjemlandet sammenliknet med forholdene dit man vurderer å flytte. Forskjeller i hva man vil tjene spiller en rolle, men også mulighetene for å få seg arbeid dit man kommer betyr noe. Kostnadene ved å flytte og etablere seg spiller åpenbart en rolle for om det er verd å flytte. Her kommer kulturelle og språklige forskjeller inn. I noen sammenhenger har økonomiske forhold liten betydning for beslutningene fordi man flykter av politiske grunner fra ett land til andre land, eller det kan være familiære bånd som motiverer flytting.

I tråd med mange studier av innvandring finner vi at økonomiske bakgrunnsvariabler har betydning for innvandring til Norge. Inntektsforskjellene mellom Norge og utlandet inngår med det forventede fortegnet og også forskjeller i fordelingen av inntekt spiller en rolle. Jo skjevere inntektsfordelingen i Norge er sammenliknet med i opprinnelseslandet, jo større blir innvandringen. Også arbeidsmarkedssituasjonen i Norge har betydning. Er arbeidsløsheten i Norge lav, vil det komme flere til Norge. Vi har kun data for arbeidsmarkedssituasjonen i noen av landene vi studerer, men for disse viser resultatene at høyere ledighet i opprinnelseslandet øker innvandringen til Norge.

Vi finner også at mange innvandringspolitiske tiltak har hatt den forventede effekten. Det gjelder for eksempel innvandringsstoppen som formelt ble innført i 1975. Vi har estimert at dette inngrepet hadde en stor og langvarig betydning for samlet innvandring til Norge. Også den videre innstramming i regelverket som skjedde i 1977 har dempet innvandringen, mens liberaliseringen i 1981, som forventet, bidro til høyere innvandring enn hva vi ellers ville ha fått. I tiden rundt 1990 var det mange spesielle begivenheter som påvirker innvandringen til Norge. Vi finner at både norsk deltakelse i EØS i 1994 og Schengen-avtalen fra 2001 bidro til økt innvandring, men særlig utvidelsen av EU i 2004 har hatt stor betydning for innvandringen til Norge. EU-utvidelsen i 2007 har ytterligere økt innvandringen til Norge. Innstramming i reglene for familiegjenforening i 2008 har hatt en betydelig effekt på innvandringen ifølge vår analyse.

1. Introduction

Immigration to more developed nations has increased significantly for several decades. In Europe the breakdown of the "iron curtain" affected migration flows, as has EU enlargements, which brought many former East-European countries into a common labour market. Although Norway is not a member of the EU, it is part of the European Economic Area (EEA) and consequently part of the common European labour market. Norway is thus affected by migration flows in Europe just as any other EU-country and migration to Norway from EU-countries has increased significantly in recent years. While Norway historically was a country with more emigration than immigration, the opposite has been the case more recently. Indeed, Norway together with Ireland was one of the countries with the highest rate of emigration during last decades of the 19th century and the first decade of the 20th century. This changed with more restrictive immigration policies in the US from the 1920s and the depression of the 1930s. Until around 1970 net immigration to Norway was negative or small. From around 1970 net immigration has been positive and gradually increasing, cf. Figure 1. With a total population of roughly 4.9 million in 2010 net immigration increased the Norwegian population by 0.8 percent that year.

Figure 1. Migration to Norway. 1951–2010

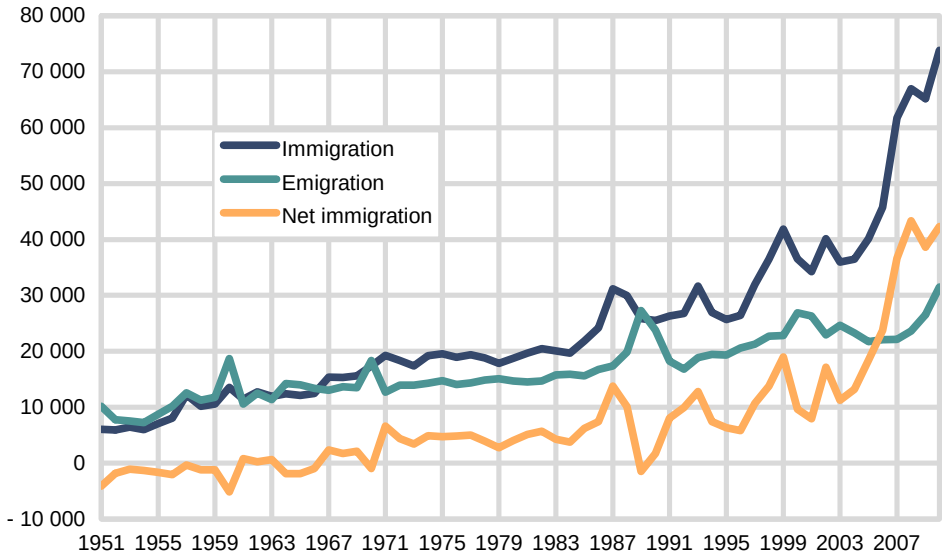
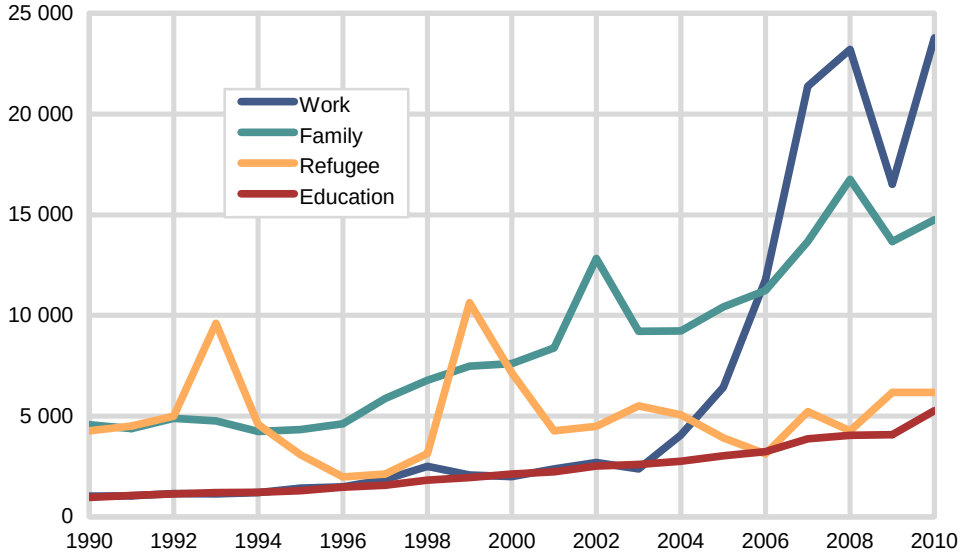


Figure 2 shows the reported motives for immigration to Norway since 1990, when the collection of these statistics started, as defined by reason for the residence permit granted.[1] We see that the number of persons admitted following an application for asylum has varied around a fairly constant level. The

[1] From 1 October 2009 non-Nordic citizens of the European Union (except Bulgarians and Romanians) only need to declare the main purpose of the stay when registering with the Norwegian authorities.

peak in 1993 is related to the war in Bosnia while the 1999-peak is mostly related to the Kosovo conflict. Student immigration to Norway has been steadily increasing from a low level. The number of people who come for work used to be at the same, quite low level, but has increased dramatically since the expansion of the EU in May 2004. Family reunion has been an important reason for immigration but is related to the other reasons and in particular to those who come for work or seeking protection. Note that these statistics do not include immigrants who are citizens of another Nordic country because they have had free access to Norway since 1957 and do not have to state any reason for immigrating when registering with the Population register.[2] Also, the statistics do not include intended stays of less than six months.

Figure 2. Immigration to Norway by registered reason for immigration[1] 1990-2009



[1] Does not include citizens of the other Nordic countries (Denmark, Finland, Iceland and Sweden)

From the mid 1970s immigration policy became a new theme in Norwegian politics and attempts at restricting immigration were put in place by a new law. Later various additional measures have been introduced, but not all of these have been restrictive. Some have been of a more liberal nature. From 1994 and onwards immigration into Norway has been affected by Norway joining the EEA. In this paper we study the effects of various immigration policy measures on immigration to Norway from all countries in the world using a macro data panel from 1969 to 2010. Policies have not been uniform across countries so we specify and test country specific or region specific policies. In order to do this we translate various immigration policies into a set of dummies for each policy. We shall return to this in Section 3 of the paper.

[2] Citizens of other countries need a residence or work permit and the basis for granting the permit is registered by UDI.

There are many studies that analyse migration based on a single destination country. The study by Clark *et al*. (2007) for the United States and by Hatton (2005) for the United Kingdom, both find evidence for the role of immigration policies. Karemera *et al*. (2000) study migration to North American destinations while Mayda (2010) studies migration to 14 OECD countries. See also Massey *et al*. (1993) for a description of various theories of migration. A number of variables have been suggested as driving forces in these migration studies. Some relate to cultural and linguistic factors while other take on a more economic perspective and focus on differences in economic opportunities such as income and labour market features. Our main focus is to analyse how changes to Norwegian immigration policies have influenced migration to Norway during the previous four decades. We incorporate some of the main ideas in previous studies of migration, and test if migration policies in Norway can explain some of the changes in immigration flows over time and from particular countries or groups of countries. Using a panel of 179 countries with statistics from 1969 to 2010 we conclude that not only do economic variables explain changes in migration to Norway over time but some of the major policy changes that have taken place are also important in understanding immigration to Norway.

In the next section we present our modelling framework while the third section discusses the data and in particular how we have created the policy intervention dummies that are linked to various immigration policies. The fourth section presents our main results and a number of sensitivity tests. We conclude in section five.

2. Modelling framework

Our basic model dates back to Roy (1951) and is elaborated by Borjas (1987). For a recent application see Mayda (2010). There are two countries: (o)rigin and (d)estination. The log of wages that an individual living in the origin country would receive if not migrating (w_o) is assumed to be

$$\log(w_o) = \mu_o + \varepsilon_o, \text{ where } \varepsilon_o \sim N(0, \sigma_o^2). \quad (1)$$

Here μ_0 is interpreted as determined by individual observables such as education, gender etc., while ε_0 captures unobservable characteristics with zero mean and a constant variance. For individuals who immigrate there is a similar wage model in the destination country

$$\log(w_d) = \mu_d + \varepsilon_d, \text{ where } \varepsilon_d \sim N(0, \sigma_d^2). \quad (2)$$

The error terms are possibly correlated with a correlation coefficient ρ. Hatton (2005) and Clark *et al.* (2007) let the $\mu's$ depend linearly on skill which is also assumed to be distributed normally so that $\log(w_o)$ and $\log(w_d)$ are also normally distributed.

The decision to immigrate or not is determined by the sign of an index I:

$$I = \log\left(w_d/(w_o + c)\right) \approx \left(\mu_d - \mu_o - \delta\right) + \varepsilon_d - \varepsilon_o. \tag{3}$$

Here c is the level of mobility costs while δ is the wage equivalent mobility cost. Immigration occurs if the value of the index I is positive. Summing over all individuals in the origin country, the emigration probability, P, from the origin country is given by

$$P = \Pr\left(\varepsilon_d - \varepsilon_o > -\left(\mu_d - \mu_o - \delta\right)\right) = 1 - \Phi\left(\left(-\mu_d + \mu_o + \delta\right)/\sigma_\varepsilon\right) = \Phi\left(\left(\mu_d - \mu_o - \delta\right)/\sigma_\varepsilon\right). \tag{4}$$

Here, σ_ε is the standard deviation of the difference of the error terms, $\varepsilon = \varepsilon_d - \varepsilon_o$, and Φ is the standard normal cumulative distribution function. Equation (4) captures some important features of empirical models of immigration. Higher income in the origin country lowers P, while higher income in the destination country increases P. In addition, the income effects are the same but with opposite signs. The variance of ε is given by

$$\sigma_\varepsilon^2 = \sigma_d^2 + \sigma_o^2 - 2\sigma_{do}. \tag{5}$$

If the destination country has a more equal distribution of income than the origin country, and this would usually be the case when Norway is the destination country, an increase in inequality in the destination country will lower σ_ε.[3] If the term in the brackets in (4) is negative so that the income in the destination country is higher than in the origin country adjusted for migration costs, an increase in destination inequality will increase immigration as argued for by Borjas (1987), Hatton (2005), and Clark *et al.* (2007). Borjas (1987) was the first to include the income distribution as a feature affecting migration. He finds that countries with more income inequality have lower emigration rates. For this

[3] Note that $\partial\sigma_\varepsilon/\partial\sigma_d = \left(\sigma_d - \sigma_o\right)/\sigma_\varepsilon$ when ε_d and ε_o are assumed to be perfectly correlated.

to be the case there must be a strong positive correlation between earnings for immigrants in the origin and the destination countries and less income inequality in the destination country. If the mean income in the destination country is higher than in the origin country – which is a major motive for emigration in the first place – and inequality increases in the origin country, then high-income persons in that country will have fewer incentives to emigrate while low-income persons in the origin country are not affected. Total emigration is then reduced. Thus, changes in the distribution of income in the origin country select or motivate on average different people to emigrate.[4] Mayda (2010) argues for including also a quadratic term of relative income inequality and finds empirical support for this specification. Also Hatton (2005) and Clark *et al.* (2007) find significant effects of variables characterising the income distribution in their models.

P in (4) is the emigration probability defined as emigration divided by the relevant population in the origin country or the emigration rate. If a model is specified using the number of emigrants as the endogenous variable while the size of the population of the origin country enters as a regressor, this restriction can be tested. This is done by Karemera *et al.* (2000) who include the (log) population in the emigration equation but their results do not support using the emigration rate specification. Kim and Cohen (2010) combine the specification in (4) into a gravity model. Let M_{od} denote the number of immigrants at any time from country o to country d, P_o the population of the origin and P_d the population in the destination, the simplest gravity model is

$$M_{od} = kP_oP_d / d_{od}, o \neq d, \tag{6}$$

where k is a constant and d_{od} refers to the distance between o and d. The standard specification used is achieved by dividing by P_o on both sides of Eq. (6) so the added feature of the gravity model is really the inclusion of the population of the destination country. Kim and Cohen (2010) test the restriction of unit elasticities of the population terms in the equation and generally reject the restriction; although in several versions their estimate of the elasticity of P_o is not far from one.[5]

[4] When σ_ε goes towards infinity it follows from (4) that the emigration probability goes towards 0.5. Thus in this case the individual acts as if he tosses a coin whether he should emigrate or stay.

[5] However, in the current paper we do not relate our model to the gravity specification.

Higher monetary costs of migration relative to income in the destination country reduce migration according to the model in (4). A theoretical model of the effects of mobility costs is the focus of Carrington *et al.* (1996). The idea here is that mobility costs decrease with the number of migrants already settled in the destination country because they send information about job and housing markets to friends and family in the origin country and generally provide a network for new entrants. The empirical specification of mobility costs is a central part of econometric analyses of immigration. Standard proxies used are language differences, geographical distance, and migration policy indicators. It is common to include social indicators like crime and corruption indicators of political systems in order to explain migration flows. Several studies referred to earlier use more or less these variables in their econometric specifications. We proxy these factors using the number of resident immigrants by country divided by the Norwegian population as one indicator for migration costs. In addition our model includes fixed effects for all countries to capture other country specific factors. We also allow for these factors to change over time by including country specific time trends.

3. Data and specification of immigration policies

Statistics on demographic and economic variables

Statistics for immigration to Norway from every country in the world are readily available in the statistics database, "Statbank" on the webpage of Statistics Norway.[6] We have chosen to model immigration by country of departure and not citizenship. Statistics on immigrants by citizenship are available, but that series starts much later and makes the study of immigration policies before 1986 impossible.[7] Also it is not entirely clear what to prefer in our context. An Ethiopian who has lived in Sweden for some time may just as well be motivated by the same factors as a Swede even if the policies that apply to him/her are different (if (s)he has not acquired Swedish citizenship). Statistics on the stock of immigrants by country is also found in this database.

For a number of the countries in the world, immigration to Norway does not take place every year. In fact for some small islands in the Pacific and Caribbean migration to Norway is a rare event. To take one example: during the period 1969 – 2010 there are four years of recorded immigration to Norway from Samoa. In these cases we have simply excluded the country from our list. We have also excluded countries where immigration never reaches 5 persons in any year. For some countries where

[6] http://www.ssb.no/english/subjects/00/00/10/innvandring_en/

[7] With one exception noted below the fact that the regulations apply to country of citizenship and not of previous residence is not expected to influence the results.

immigration is quite regular, there are also some years with no recorded immigration. These zero observations have been excluded from the sample in line with Kim and Cohen (2010). Table B2 shows the number of observations by country included in the sample.[8]

Population statistics for all countries have been taken from United Nations, Population Division.[9] The statistics for Norway have been taken from the Statbank, as referred to earlier.

For economic statistics we rely on relative income measured by GDP per capita in PPPs and current US dollars based on Penn World Tables cf. Heston *et al*. (2011). We use GDP-figures in nominal terms as it is relative GDP-levels that are used in the model. We have also included the unemployment rate in Norway.[10] These figures are taken from OECD-databases and usually go back to 1970. Income data are problematic. We have relied on three main sources of information. High quality data, sometimes even going back before 1970, are generally available for countries taking part in the Luxembourg Income Study (LIS).[11] For most countries however, we rely on the WIDER database.[12] For Latin-American countries we also use data from the SEDLAC homepage.[13] The WIDER database indicates data quality by using a scale from 1 to 4. When possible we rely mostly on high quality data but have tried to make our coverage as complete as possible. In general, data are better and comparable the more recent they are. For some countries there are comparable figures only for a few years. These are used to calibrate the level and lower quality data are used to interpolate between these years. When also these are missing linear interpolation is used.

Immigration policies and legislation in Norway

We now turn to how we have translated Norwegian immigration policies into quantitative variables. First, we emphasise that immigration from the other Nordic countries (Denmark, Finland, Iceland and Sweden) has not been affected by any policy changes after the establishment of a Nordic passport union in 1957, which gave Nordic citizens free access to all the Nordic countries without needing

[8] In Table B4 we list the countries that are excluded from our analysis.

[9] World Population Prospects: The 2008 Revision - Extended CD-ROM Edition.

WPP2008_ASCII_FILES/WPP2008_DB02_POPULATIONS_ANNUAL

[10] In some subsample estimations we also exploit the unemployment level in the origin country. For many countries in the sample no reliable unemployment data have been found and the sample where unemployment in the origin country is included is therefore much smaller than the total sample.

[11] Data can be found on http://www.lisdatacenter.org/data-access/keyfigures/

[12] Cf. UNU-WIDER World Income Inequality Database, Version 2.0c, May 2008 available at http://www.wider.unu.edu/. LIS data is also included in the WIDER database.

[13] http://sedlac.econo.unlp.edu.ar. Database updated by April 2011.

passports, resident permits or work permits. It is also possible for Nordic citizens to commute or immigrate to Norway for short term stays, e.g. to work, without even having to register with the population register that represents the main source of the immigration statistics used in this study. Consequently, no changes in immigration policies affect Nordic citizens.

Table 1. An overview of policy dummies and their expected sign in the econometric model

DDUM1974	Ban on general work permits. All countries. Negative
DUM1977	Residence permits not granted to illegally entrants. All countries. Negative
DUM1981	Residence permits for immigrant students and school attendants. They were also given work permits. More liberal rules for family reunions. All countries. Positive
DUM1991	Easier family reunion, work permits given to applicants for residence. All countries. Positive
DUM1994	Norway joins the EEA. EEA-citizens free access. Positive
DUM1997	Liberalisation related to the Geneva-convention. Refugees. Positive
DUM1998	Liberalisation for refugees. Positive
DUM1999	New law on human rights. UN convention on women and children. Positive
DUM2000A	Easier access for people with specialist competence. Positive
DUM2000B	Easier access for Iraqis. Positive
DUM2001A	Schengen-convention. Liberalisation for Schengen member countries (”S”)
DUM2001B	Schengen-convention may affect immigration from non-Schengen countries (“O”) negatively
DDUM2003	Liberalisation in 1997 tightened in 2003. Affecting mostly people from Afghanistan, Iraq, Somalia and countries in former Yugoslavia. Negative
DDUM2004	Extension of EU included Czech republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia. Positive for these countries
DUM2005	Easier access for Vietnamese refugees on the Philippines and Iraqis. Positive
DUM2006	More restrictive rules for family reunion for immigrants arriving on tourist visa. Negative for non-EU countries
DUM2007EU	New EU members: Bulgaria and Romania. Positive for these two countries
DUM2007A	New EU members from 2004 included in the Schengen area. Positive
DUM2007B	Residence for certain asylum seekers. Positive
DUM2008	Stricter economic demands for family reunion. Negative
DUM2009A	Temporary and transition rules applying to new (from 2004) EU members lifted. Positive effect for countries affected by Dummy 2004.
DUM2009B	Switzerland joins Schengen. Positive

Out of a large number of changes to laws and regulations listed on the home page of the Norwegian Directorate of Immigration[14] we have selected 21 as basis for specifying policy dummies to capture various aspects of policy changes, where some changes apply to all countries, some to a group of countries and, sometimes only to very few or even a single country. Since some of the policy changes are partly overlapping in time, one cannot include too many of the policy dummies in the model specification. Table 1 summarises the policy variables included in our study. We have included what we regard as the most important policy changes. We disregard minor changes such as higher visa fees

[14] http://www.udi.no/Oversiktsider/Statistikk-og-analyse/FoU---rapporter1/Historisk-oversikt-over-regelverksendringer-/.

(which are anyway quite moderate). A certain element of subjectivity must of course be used when choosing what to include and what to exclude and here we have relied on expert advice from the immigration authorities in our selection of policy changes. The presentation of the policy changes in Table 1 gives an idea of the level of detail that we address and implicitly what we have excluded in the sense that other changes are not judged as being important enough on a priori grounds relative to those we have included. We refer to Appendix C for a more detailed explanation of the policy dummies. We should also note by specifying changes as step dummies we cannot be sure that we actually capture a policy change. The step dummies could in principle capture other changes affecting immigration. We do try to address this issue to some extent with robustness checks in Section 4.

4. Model and empirical results

In this paper we consider a specification of the following type:[15]

$$\begin{aligned} &\log(M_{i,t}/P_{i,t}) = \beta_1 \log(M_{i,t-1}/P_{i,t-1}) + \beta_2 \log(IS_{i,t-1}/PNOR_{t-1}) + \\ &\beta_5 \log(GDPCAP_{i,t-2}/GDPCAPNOR_{t-2}) + \beta_4 URNOR_{t-1} + \beta_5 UR_{i,t-1} + \\ &\beta_6 GINIRATIO_{it} + \beta_7 GINIRATIO_{it}^2 + INTERV_{it}\,\gamma + \rho_1 DUMCHILE_t + \\ &\rho_2 DUMLIBERIA_t + \rho_3 DUMSOMALIA_t + \mu_i + \delta_i(t-1966) + \varepsilon_{it}; \\ &t = 1969,\ldots,2010,\ i \in I_{145}. \end{aligned} \tag{7}$$

The left hand side variable in Eq. (7) is the log of the (scaled) gross immigration rate (gross immigration to Norway divided by the population) of country *i* in year *t*. As explanatory variables we have, in addition to the lagged endogenous variable, six "incentive" variables and a country-specific vector of intervention variables, $INTERV_{it}$. Finally we have added (i) some dummy variables to account for large residuals for some countries (Chile, Liberia and Somalia), (ii) country specific fixed effects, μ, (iii) linear country-specific deterministic trends, δ, and (iv) a genuine white noise error term, ε. The incentive variables are:

(i) the log of the ratio between the immigration stock of country *i* and the Norwegian population (IS/PNOR) lagged one year, to capture effects on immigration costs in that a higher number of previous immigrants from a country will make it less costly for newcomers to settle in Norway, cf. Carrington *et al.* (2003),

[15] We specify (7) with lags on the incentive variables corresponding to what we have ended up with in connection with our reference model. The lags were chosen such that the incentive variables entered the equation with the correct sign and as significant as possible. Furthermore, one may argue, from a theoretical point of view, that the immigrants probably need some time to assess relevant information in conjunction with an immigration decision.

(ii) the log of GDP per capita of country *i* divided by GDP per capita for Norway lagged two years, (GDPCAP/GDPCAPNOR) in order to capture the relative income effect,

(iii) the unemployment rate in Norway (URNOR) lagged one year, to capture the effect of labour market slackness on migration,

(iv) the unemployment rate in the origin country to capture the effects of labour market condition as a push factor behind emigration,

(v) a second order polynomial in the ratio between the income distribution in the origin country and the income distribution of Norway to capture a selection mechanism behind immigration.

The variables contained in the vector with intervention variables, $INTERV$, are those occurring in the text column of Table 2 after the variable *DUMSOMALIA*. For further information on these variables cf. Table 1, Table B1 and Appendix C. It is not uncommon to include fixed period effects in panel data models. However, in the current we have decided not to do so. Since the models already contain various time dummies that are assumed to influence the vast majority of countries and since all the model specifications involve the Norwegian unemployment rate, inclusion of year dummies will raise questions of identification and lead to overparameterized models with unclear interpretation.

I_{145} denotes a set with 145 current country numbers that are listed in Table B2. The panel data set is unbalanced and Table B2 gives an overview of the effective number of observations for each country in I_{145}. We have, as noted earlier, omitted some small countries and observations for which the number of immigrants to Norway in the current and previous year is less than five persons.[16]

Main Empirical results

Since we have information on foreign unemployment and income distribution only for a subset of countries these variables are not included in our basic model.[17] Weighted least squares, with weights based on population size, is our main estimation method, but we also present estimates based on ordinary least squares.[18] We have not tested the assumption of exogenous policy dummies. Heuristically

[16] Cappelen *et al.* (2011), who use the same data material as in the current paper, consider subsample estimation for different geographical areas. Such type of robustness analysis is not undertaken in this paper, but is viewed as a topic for further work.

[17] The reference model corresponds to the restricted case in Table 2.

[18] All the calculations have been done by means of TSP version 5.0, cf. Hall and Cummins (1995). This software program contains a module for panel data analysis. However, this routine has not been utilized since we (i) consider weighted regression and (ii) incorporate country-specific linear deterministic trend effects. Thus, we have estimated the model using the routine for weighted least squares. This is facilitated by including a large amount of deterministic variables that take care of country specific effects and country specific linear trends. We do not consider random effects models in this paper. Consistent estimation of random effects models with lagged endogenous variables requires instrumental variables. We leave this for future analysis.

we do have some arguments in support of exogeneity. All variables in the main model except the unemployment and the policy dummies rate are trending. It is impossible to argue that the unemployment rate is correlated with the policy dummies. The first two restrictive dummies were introduced at a time when the unemployment rate was low by historical standards. The liberalisation in 1981 also took place at a time of low unemployment although slightly higher than in 1974 and 1977. The dummies that capture Norway's relationship to the EU are also not related to contemporaneous variables in the model. The 1994 enlargement affected several countries and Norway's decision not to join might possibly be related to economic factors (as in 1972 when there also was a no majority in a referendum). The enlargements in 2004 and 2007 clearly had nothing to do with Norwegian politics.

The main empirical results are reported in Table 2.[19] In the left part of this table we consider the unrestricted case and in the right part a restricted case. The restricted case is mainly obtained by excluding insignificant variables from the econometric specification.[20] However, when economic variables enter with a correct sign, we have retained them in the models even if the attached estimated slope parameters are not very significant. The restricted specification cannot be rejected when tested against the unrestricted specification using an LR-test.[21] Hence, in the following we only comment on the restricted case.

As seen from Table 2 we obtain correct signs of the estimated effects of the lagged endogenous variable and the incentive variables. The effect of the lagged endogenous variable is large and highly significant. The lagged stock of immigrants from a specific country relative to the Norwegian population (log-transformed) enters significantly in the specification and with a positive sign as expected. GDP per capita relative to the level in Norway (with a two year lag and log-transformed) is included as suggested by theory, but its estimated slope coefficient only has a t-value of about 1.4 (in absolute value). The Norwegian unemployment rate enters significantly. An increase in the Norwegian unemployment rate decreases, ceteris paribus, immigration to Norway.

[19] We do not report estimates of the country-specific fixed effects and the country-specific linear trend effects in Table 2.

[20] All the country-specific fixed effects have been retained, as well as country-specific trend variables with estimates with t-values higher than unity in absolute value.

[21] The unrestricted model contains 319 unknown parameters including the variance of the error term and has a log-likelihood value equal to –3,493.99. The corresponding figures for the restricted model are 233 and –3,506.17. Thus using an LR-test statistic the restricted model cannot be rejected against the unrestricted model.

Table 2. Empirical analysis of immigration to Norway from the entire world. Unrestricted and restricted specification[a]

Variable	Unrestricted case		Restricted case	
	Estimate	t-value	Estimate	t-value
$log(M/P)_{t-1}$	0.592	46.940	0.598	49.169
$log(IS/PNOR)_{t-1}$	0.030	1.590	0.030	2.315
$log(GDPCAP/GDPCAPNOR)_{t-2}$	-0.038	-0.899	-0.046	-1.413
$URNOR_{t-1}$	-0.060	-6.750	-0.059	-7.071
DUMCHILE	1.466	3.482	1.414	3.407
DUMLIBERIA	2.399	2.701	2.395	2.720
DUMSOMALIA	1.790	2.995	1.814	3.112
DNNORDIC×DDUM1974	-0.105	-3.479	-0.104	-3.694
DNNORDIC×DUM1977	-0.063	-2.186	-0.059	-2.148
DNNORDIC×DUM1981	0.073	2.662	0.075	3.354
DNNORDIC×DUM1991	-0.099	-3.232	-0.096	-3.593
DEEA×DUM1994	0.109	1.603	0.142	2.606
DREFUGEE×DUM1997	0.788	3.637	0.800	4.029
DNNORDIC×DUM1998	0.047	1.277	0.052	1.567
DNNORDIC×DUM1999	-0.190	-4.844	-0.189	-4.900
DUMMYIRAQ×DUM2000B	-0.141	-0.408		
DNNORDIC×DUM2000A	-0.075	-1.952	-0.074	-1.953
DSCHENGEN×DUM2001A	0.123	1.727	0.140	2.059
DNNORDIC×(1-DSCHENGEN)×DUM2001B	0.143	4.572	0.144	4.823
DREFUGEE×DDUM2003	-0.088	-0.415		
DEXTEU×DDUM2004	0.885	4.560	0.900	6.271
DVIETNAM×DUM2005	0.147	1.225	0.146	1.243
DVISA×DUM2006	0.009	0.283		
DBULROM×DUM2007EU	0.493	2.060	0.502	2.129
DEXTEU×DUM2007A	0.080	0.347		
DLIB×DUM2007B	0.062	1.580	0.073	2.487
DSTRICT×DUM2008	-0.190	-5.984	-0.189	-6.145
DTRANS×DUM2009A	0.254	1.058		
DSWI×DUM2009B	0.132	0.227		
Number of observations	4,220		4,220	
R^2	0.947		0.946	

[a]Left hand side variable $log(M/P)_t$. For the definition of the variables in the text column see Table B1.

We find that the majority of the policy intervention variables enter with the correct sign. For some of the intervention variables we find no significant effects. In Table 3 we give a qualitative overview of the obtained results. For the immigration regulations introduced in 1974 and 1977, respectively, the correct negative sign is obtained. The liberalisation introduced in 1981 has as expected a positive effect. For the liberalization policy launched in 1991 we obtain a significant estimate with the wrong sign. As explained in Appendix C the policy changes in 1991 consisted of both restrictive measures and liberalisations so the total estimated effect is perhaps not surprising.

Table 3. Expected and estimated sign of coefficients for policy variables. Restricted specification[a]

Variable	Expected sign	Estimated sign
DNNORDIC×DDUM1974	Negative	Negative
DNNORDIC×DUM1977	Negative	Negative
DNNORDIC×DUM1981	Positive	Positive
DNNORDIC×DUM1991	Positive	Negative
DEEA×DUM1994	Positive	Positive
DREFUGEE×DUM1997	Positive	Positive
DNNORDIC×DUM1998	Positive	Positive
DNNORDIC×DUM1999	Positive	Negative
DNNORDIC×DUM2000A	Positive	Negative
DSCHENGEN×DUM2001A	Positive	Positive
DNNORDIC×(1-DSHENGEN)×DUM2001B	Negative	Positive
DEXTEU×DDUM2004	Positive	Positive
DVIETNAM×DUM2005	Positive	Positive
DBULROM×DUM2007EU	Positive	Positive
DLIB×DUM2007B	Positive	Positive
DSTRICT×DUM2008	Negative	Negative

[a]Left hand side variable $log(M/P)_t$. For the definition of the variables in the text column see Table B1.

A liberalization aimed at refugees was introduced in 1997. A correct sign is obtained for the estimated coefficient attached to this variable, and the estimate is significant. Also for the liberalization launched in 1998 we obtain the correct sign and a significant estimate. A wrong sign is obtained in connection with the liberalization in 1999. The Schengen area convention introduced in 2001 is expected to increase immigration to Norway from countries in the Schengen area but to lead to less immigration from the countries outside the Schengen area. Let us first consider the Schengen area. For this area we obtain the right positive sign, but, against intuition, the estimate of the effect for the non Schengen area is also positive and significant. The absolute value is equal to the estimate for the Schengen area. In 2003 a stricter regime for family-reunion was introduced. This intervention is restricted to influence potential immigrants from Afghanistan, Iraq, Somalia and countries in former Yugoslavia. We are unable to find any negative effect of this intervention variable. In 2004 there was an extension of the EU/EEA area with some new East-European countries. The consequence was that people from these new countries obtained easier access to Norway. Hence, the sign of the estimated effect is in accordance with our a priori expectation. The dummy that captures the positive immigration effect from Philippines and Iraq to Norway enters with the correct sign, but the effect is not very significant. In 2007 there was another extension of the EU/EEA area since Bulgaria and Romania were included. In accordance with our expectations we obtain a positive effect of this extension. The stricter demands for family reunion introduced in 2008 had, as expected, a significant negative influence.

We have also included dummies for Chile, Liberia and Somalia. A look at preliminary estimation results revealed that the residuals for these three countries were especially large in some years. Hence the dummy variables *DUMCHILE*, *DUMLIBERIA* and *DUMSOMALIA* are included to account for these large residuals.[22] The estimates of the three attached parameters are all positive and significant.

Table 4. Empirical analysis of immigration to Norway from the entire world. Restricted specification. Model without incentive variables and model without trend variables[a]

Variable	Reference (restricted)		Without incentive variables		Without trend variables	
	Estimate	t-value	Estimate	t-value	Estimate	t-value
$log(M/P)_{t-1}$	0.598	49.169	0.605	51.447	0.755	72.798
$log(IS/PNOR)_{t-1}$	0.030	2.315			0.057	5.264
$log(GDPCAP/GDPCAPNOR)_{t-2}$	-0.046	-1.413			0.264	13.498
$URNOR_{t-1}$	-0.059	-7.071			-0.061	-7.005
DUMCHILE	1.414	3.407	1.466	3.511	1.371	3.126
DUMLIBERIA	2.395	2.720	2.318	2.616	2.206	2.456
DUMSOMALIA	1.814	3.112	1.864	3.178	0.882	1.686
DNNORDIC×DDUM1974	-0.104	-3.694	-0.088	-3.121	-0.082	-2.786
DNNORDIC×DUM1977	-0.059	-2.148	-0.052	-1.904	0.024	0.845
DNNORDIC×DUM1981	0.075	3.354	0.035	1.727	0.134	5.852
DNNORDIC×DUM1991	-0.096	-3.593	-0.222	-12.923	0.015	0.535
DEEADUM1994	0.142	2.606	0.138	2.520	0.082	1.708
DREFUGEE×DUM1997	0.800	4.029	0.848	4.249	0.202	1.673
DNNORDIC×DUM1998	0.052	1.567	0.161	5.482	0.106	3.086
DNNORDIC×DUM1999	-0.189	-4.900	-0.141	-3.675	-0.192	-4.705
DNNORDIC×DUM2000A	-0.074	-1.953	-0.073	-1.918	-0.069	-1.735
DSCHENGEN×DUM2001A	0.140	2.059	0.136	1.999	0.249	3.952
DNNORDIC×(1-DSCHENGEN)× DUM2001B	0.144	4.823	0.102	3.505	0.189	6.032
DEXTEU×DDUM2004	0.900	6.271	0.933	6.474	0.714	6.080
DVIETNAM×DUM2005	0.146	1.243	0.121	1.022	0.156	1.669
DBULROM×DUM2007EU	0.502	2.129	0.555	2.340	0.916	4.264
DLIB×DUM2007B	0.073	2.487	0.119	4.134	0.098	3.199
DSTRICT×DUM2008	-0.189	-6.145	-0.149	-4.899	-0.200	-6.164
Number of observations	4,220		4,220		4,220	
R^2	0.946		0.945		0.936	

[a] Left hand side variable $log(M/P)_t$. For the definition of the variables in the text column see Table B1.

In Table 4 we report estimation results for two special cases of the reference model. In the third column we report the estimates of a model where the parameters attached to the incentive variables are constrained to zero. The main impression is that the parameter estimates attached to the policy intervention variables are not much changed qualitatively by the zero restrictions. The sign of the

[22]The binary variable *DUMCHILE* is one in 1987 and 1988 and zero in all other years and affects only Chile. The binary variable *DUMLIBERIA* is one in 2003 and 2004 and zero in all other years and affects only Liberia. The binary variable *DUMSOMALIA* is one in the years 1988–2010 and zero in all the years before 1988 and affects only Somalia.

estimates are the same as in the reference specification. So the estimates of the effects of the intervention variables seem to be fairly robust with respect to whether the incentive variables are included or not. In the column next to the last of Table 4 we report the estimates of a model where all the country specific trend variables have been omitted. For this case we obtain a higher estimate of the coefficient attached to the lagged endogenous variable and a positive significant effect of the relative GDP-variable. Thus, the presence of country specific linear trends seems to be necessary in order to get the right sign of the relative GDP-effect. The model with omitted country specific linear trend variables contains 170 parameters (includeing the variance of the error term) and has a log-likelihood value equal to –3774.52. Thus if one tests this specification against the reference specification using an LR-test one obtains a $\chi 2$ value of 561.06. The associated degree of freedom is 65. Hence, the specification without country specific trends is clearly rejected.

Our main estimation method is weighted least squares with population as weights. The reason for this is that we are pooling countries that differ substantially in population size. We have also estimated the reference model with ordinary least squares. The results are reported in Table A1. Even if most of the estimates retain their sign they differ somewhat from those obtained when using weighted least squares with population weights and so does the estimation uncertainty. For instance the variable representing the immigration restrictions launched in 1977 still have the right sign, but the magnitude of the estimated slope coefficient of this variables has been almost halved and it has now turned insignificant. Thus, it makes a difference which estimation method that is used.[23]

In the second column of Table B2 the effective number of observations for each country involved in the estimation of the main model is reported. For some of the countries the number of effective observations is rather low. In light of a potential problem of biased estimation stemming from few observations in the time dimension in dynamic models with fixed effects, cf. Nickell (1981), we have reestimated the main model after excluding countries with fever than 15 observations. The estimates in this case are reported in Table A2 and they show there is no substantial change in any of the estimates, which may imply that there is no “Nickell-bias”.

[23] We have also estimated the reference model with weighted least squares using immigration weights. However, some of the results appear rather strange. The estimate of the slope parameter attached to the immigration stock now turns negative and besides the coefficient of the lagged endogenous variable is substantially lower than when weighted least squares is based on population weights. Finally, we have carried out weighted least squares using log population as weights. This variant produced results that resemble those obtained using ordinary least squares.

Changes in the income distribution

As commented on earlier in the paper changes in the income distribution in both the origin and destination country may influence immigration. It is relevant to ask whether this effect is important from an empirical point of view. For 101 of the 145 countries considered when estimating the reference model we have access to time series for the Gini-coefficient. Using this subsample we reestimated the reference model after having added a second order polynomial in the ratio between the Gini-coefficient of the origin country and Norway. Whereas the reference model was estimated using 4,220 observations the augmented model is estimated with 3,083 observations. The results are shown in Table 5. We obtain a significant positive estimate of the first order variable and a significant negative estimate of the quadratic term.[24] Within our sample an increase in the inequality of the income distribution of the origin leads, mainly, to, an increase in the immigration to Norway. In this augmented model the estimate of the income ratio is smaller and substantially less significant than in the reference model, the t-value now being only around 0.4 in absolute value. Generally the estimates of the common parameters in the augmented and reference model are similar. We now get a smaller and insignificant estimate of the coefficient attached to the intervention directed towards refugees from 1997. This is not surprising since some of the countries influenced by this variable are omitted from the subset of data used in the conjunction with the subsample estimation. However, by and large, including variables on income inequality for a smaller set of countries with appropriate data, does not change our conclusions with regard to the qualitative effects of policy interventions.

[24] From Eq. (7) we have that $GINIRATIO_{it}$ denotes the ratio between the Gini-coefficient in country *i* and Norway in year *t*. In the estimated regression the effect of the variable is specified as $\hat{\beta}_6 GINIRATIO_{it} + \hat{\beta}_7 GINIRATIO_{it}^2$, where $\hat{\beta}_6 = 0.935$ and $\hat{\beta}_7 = -0.203$. Note that the derivative is given by $\hat{\beta}_6 + 2\hat{\beta}_7 GINIRATIO$. In our sample *GINIRATIO* varies between 0.697 and 2.915. An increase in GINIRATIO yields an increase in the immigration for most of the countries. However, when evaluating the term $\hat{\beta}_6 + 2\hat{\beta}_7 GINIRATIO$ in the observed data points, we find that it is negative in at least one year for 24 countries.

Table 5. Empirical analysis of immigration to Norway. Models without and with time series of Gini-variables[a]

Variable	Without Gini-variables		With Gini-variables	
	Estimate	t-value	Estimate	t-value
$log(M/P)_{t-1}$	0.598	49.169	0.583	40.391
$log(IS/PNOR)_{t-1}$	0.030	2.315	0.034	2.220
$log(GDPCAP/GDPCAPNOR)_{t-2}$	-0.046	-1.413	-0.017	-0.412
$URNOR_{t-1}$	-0.059	-7.071	-0.053	-5.729
GINIRATIO			0.935	4.753
GINIRATIO SQUARED			-0.203	-3.601
DUMCHILE	1.414	3.407	1.478	3.320
DUMLIBERIA	2.395	2.720		
DUMSOMALIA	1.814	3.112		
DNNORDIC×DDUM1974	-0.104	-3.694	-0.092	-3.015
DNNORDIC×DUM1977	-0.059	-2.148	-0.054	-1.809
DNNORDIC×DUM1981	0.075	3.354	0.057	2.287
DNNORDIC×DUM1991	-0.096	-3.593	-0.106	-3.554
DEEA×DUM1994	0.142	2.606	0.147	2.488
DREFUGEE×DUM1997	0.800	4.029	0.516	0.745
DNNORDIC×DUM1998	0.052	1.567	0.069	1.896
DNNORDIC×DUM1999	-0.189	-4.900	-0.209	-4.889
DNNORDIC×DUM2000A	-0.074	-1.953	-0.038	-0.902
DSCHENGEN×DUM2001A	0.140	2.059	0.150	2.030
DNNORDIC×(1-DSCHENGEN)×DUM2001B	0.144	4.823	0.153	4.592
DEXTEU×DDUM2004	0.900	6.271	0.933	5.832
DVIETNAM×DUM2005	0.146	1.243	0.168	1.178
DBULROM×DUM2007EU	0.502	2.129	0.476	1.723
DLIB×DUM2007B	0.073	2.487	0.061	1.846
DSTRICT×DUM2008	-0.189	-6.145	-0.205	-5.560
Number of observations	4,220		3,083	
R^2	0.946		0.952	

[a] Left hand side variable $log(M/P)_t$. For the definition of the variables in the text column see Table B1. Note that some of the variables in the text column have to be redefined when one considers estimation using data only for countries for which we have access to time series of Gini coefficients. For example *DREFUGEE* degenerates to an indicator dummy for Croatia, Macedonia and Slovakia since we, cf. Table B2, do not have income distribution data for Afghanistan, Iraq, Somalia, Bosnia Herzegovina, and Montenegro and Serbia.

The importance of the unemployment rate in the origin country

In the reference model the Norwegian unemployment rate enters as a significant explanatory variable with a negative sign. An interesting question is whether the unemployment rate in the origin country also plays a role. Unfortunately, we only have unemployment rates for a small group of selected countries, mostly OECD-countries. In Table 6 we consider a subsample estimation using data for 31 countries in which we add the foreign unemployment rate lagged one year as an additional regressor.[25] As is seen from the left hand part of Table 6 we obtain a significant positive estimate of the unemployment level in the origin country and as before a negative coefficient for the Norwegian unemployment level. The difference in absolute value suggests that the two unemployment variables

[25] The countries are listed in Table B3.

should be specified as two separate variables in the regression. Just using the difference in the unemployment rates does not seem to be empirically valid. Note that for this subsample we obtain a significant negative estimate of the relative income variable as expected. However, we still struggle with some of the signs of the effects of the intervention variables, for instance the effects related to the two liberalization interventions in 1999 and 2000. In the right hand part of Table 6 we report results from a specification in which we also have added a second order polynomial in the Gini-coefficient ratio but the two involved variables are highly insignificant for this subset of countries.

Table 6. Empirical analysis of immigration from countries for which one observes the origin unemployment level[a]

Variable	Without Gini-variables		With Gini-variables	
	Estimate	t-value	Estimate	t-value
$log(M/P)_{t-1}$	0.602	23.194	0.599	22.243
$log(IS/PNOR)_{t-1}$	0.057	1.741	0.071	1.940
$log(GDPCAP/GDPCAPNOR)_{t-2}$	-0.182	-2.656	-0.221	-2.853
$URNOR_{t-1}$	-0.041	-4.571	-0.037	-3.907
UR_{t-1}	0.009	2.505	0.008	2.153
GINIRATIO			0.002	0.005
GINIRATIO SQUARED			-0.007	-0.065
DNNORDIC×DDUM1974	-0.056	-1.719	-0.060	-1.786
DNNORDIC×DUM1977	-0.070	-2.436	-0.073	-2.509
DNNORDIC×DUM1981	-0.042	-1.686	-0.050	-1.916
DNNORDIC×DUM1991	0.093	3.184	0.084	2.786
DEEA×DUM1994	0.058	1.945	0.061	1.985
DNNORDIC×DUM1998	-0.045	-1.245	-0.039	-1.057
DNNORDIC×DUM1999	-0.108	-2.481	-0.106	-2.389
DNNORDIC×DUM2000A	-0.116	-2.713	-0.118	-2.684
DSCHENGEN×DUM2001A	0.202	4.410	0.191	4.001
DNNORDIC×(1-DSCHENGEN)×DUM2001B	0.060	1.667	0.048	1.305
DEXTEU×DDUM2004	0.815	6.877	0.794	6.455
DLIB×DUM2007B	-0.016	-0.408	-0.015	-0.374
DSTRICT×DUM2008	-0.063	-1.479	-0.016	-0.338
Number of observations	1,052		982	
R^2	0.983		0.979	

[a] Left hand side variable $log(M/P)_t$. For the countries included in this estimation see Table B4. For the definition of the variables in the text column see Table B1. Note that some of the variables in the text column are redefined when one considers estimation using data only for countries for which one has access to origin unemployment rates. For example *DEXTEU* is now one for Estonia, Hungary, Poland and Slovakia and zero for all other countries included in the estimation of the econometric relation.

Some counterfactual exercises

We now use the estimated model for counterfactual analysis. We will consider two policy changes. Simulation I tries to answer how immigration to Norway would have changed if the 1973-policy regime had been maintained in the subsequent years. The second policy analysis (Simulation II) addresses how Norwegian membership in the European Economic Area (EEA) and the Schengen area has affected immigration. These analyses are not without problems. First, we are unable to obtain the "correct" sign of all the estimated parameters related to the intervention dummies, cf. Table 3.

Second, we implicitly will have to assume that the estimates of the slope parameters are not affected by the counterfactual situation. Third, the dataset is, as mentioned earlier, unbalanced, which creates problem for the dynamic simulation of all the countries in the model. Finally, it is a very partial exercise in that all other variables of the model are assumed unaffected. If immigration is higher, several of the right hand side variables might possibly be affected too and these changes are not included in the simulations. One obvious example is that a change which increases immigration will most likely also increase the stock of immigrants unless there is a similar increase in emigration. The latter effect is ignored in these simulations. The countries included in, respectively, Simulation I and Simulation II are listed in the two last columns of Table B2. The point of departure is the reference model.

In Simulation I we study the "global" intervention effects and start the dynamic simulations in 1974. As a reference we simulate a model that corresponds to the restricted case in Table 2. For each year we deduce the total number of immigrants from the 70 countries indicated in the column next to the last in Table B2. In the counterfactual simulation we set, cf. Table B1, the following policy variables to zero: *DDUM1974*, *DUM1977*, *DUM1981*, *DUM1997*, *DUM1998*, *DUM2007B* and *DUM2008*.[26] The simulation results are reported in Table 7. In the first column we report the reference path, whereas the counterfactual path is reported in the second column. The two last columns contain the difference in immigration between the counterfactual and the reference path in absolute and relative terms. In the 1970s we note the impact of the restrictions launched in 1974 and 1977. Our estimate is that immigration to Norway due to these two policies was reduced by 28 percent by 1980. The effects increase over time due to the lagged responses of the policies. The 1981-liberalisation reduced the effects of the more restrictive policies significantly during the first half of the 1980s. The policies of the 1970s and early 1980s thus seem to have reduced total immigration by roughly 16 percent. The liberalisation in 1998 increases immigration further and by early 2000s the total effects of the mentioned policies have reduced immigration by only 5 percent compared to policies that were in place before 1974.

If we look at the accumulated changes over three decades the total effect on immigration has been considerable. By 2010 total immigration was reduced by nearly 116 000 persons due to these immigration policies according to our model. But we should note the partial character of the simulations. Although some of the immigrants would have emigrated again, the stock of immigrants has been

[26] Since the variables *DNNORDIC×DUM1991*, *DNNORDIC×DUM1999*, *DNNORDIC×DUM200A* and *DNNORDIC×(1-DSCHENGEN)×DUM2001B* enter with the wrong sign, we include them both in the reference and counterfactual simulations. Thus we refrain from interpreting these variables as intervention variables.

negatively affected by the policies. A lower stock of immigrants would have reduced the number of immigrants further since stocks of immigrants in Norway reduce transaction costs. On the other hand a higher number of immigrants may have increased unemployment and led later to fewer immigrants. These arguments simply add up to the need of analysing the issue within a much more complete "model" of the Norwegian society.

Table 7. Counterfactual analysis of immigration to Norway (70 countries). Simulation I[a]

Year	Reference path	Counterfactual path	Absolute difference	Difference in percent
1974	16,969	18,066	1,097	6.5
1975	17,626	19,584	1,958	11.1
1976	17,807	20,301	2,494	14.0
1977	17,613	21,167	3,554	20.2
1978	18,023	22,360	4,337	24.1
1979	18,165	22,978	4,813	26.5
1980	18,350	23,497	5,147	28.0
1981	19,953	24,589	4,636	23.2
1982	20,781	25,019	4,238	20.4
1983	20,830	24,730	3,900	18.7
1984	20,147	23,727	3,580	17.8
1985	20,229	23,716	3,487	17.2
1986	21,296	24,907	3,611	17.0
1987	23,660	27,686	4,026	17.0
1988	25,999	30,492	4,493	17.3
1989	24,482	28,636	4,154	17.0
1990	21,929	25,639	3,710	16.9
1991	19,220	22,380	3,160	16.4
1992	17,739	20,613	2,874	16.2
1993	16,776	19,476	2,700	16.1
1994	16,966	19,732	2,766	16.3
1995	17,886	20,831	2,945	16.5
1996	19,298	22,502	3,204	16.6
1997	21,889	25,392	3,503	16.0
1998	25,959	28,992	3,033	11.7
1999	26,463	28,773	2,310	8.7
2000	25,975	27,752	1,777	6.8
2001	28,362	30,083	1,721	6.1
2002	30,417	32,102	1,685	5.5
2003	31,635	33,276	1,641	5.2
2004	32,676	34,344	1,668	5.1
2005	34,633	36,409	1,776	5,1
2006	37,572	39,152	1,580	4,2
2007	47,901	47,908	7	0,0
2008	52,562	55,407	2,845	5,4
2009	55,288	60,296	5,008	9,1
2010	57,657	63,934	6,277	10,9
Sum	960,733	1,076,448	115,715	12,0

[a]The reference path corresponds to dynamic simulation starting in 1974 using the estimated parameters reported for the restricted case in Table 2. For the counterfactual path we set the values of the intervention variables *DDUM1974*, *DUM1977*, *DUM1981*, *DUM1997*, *DUM1998*, *DUM2007B* and *DUM2008* to zero in all years and perform dynamic simulation. The countries involved are listed in the column next to the last in Table B2.

Simulation II captures effects of Norwegian membership in the EEA and the Schengen area which implies that the enlargement of the EU in 2004 and 2007 also affects Norway. We now start the simulations in 1994 to capture the first policy change. In this case simulations are done for the 139 countries indicated in the last column of Table B1. Under the counterfactual simulations we put, cf. Table B1, the following variables to zero: *DUM1994*, DUM2001A, *DDUM2004* and *DUM2007EU* keeping the other policy dummies as in the reference simulation. So we may interpret this simulation as showing the effect of Norway not joining the EEA and the further implications of not being associated to the EU system. The implication of the EEA membership in 1994 is quite modest according to our model. Immigration increased by roughly 5 percent. The effect of joining the Schengen area increases this rate somewhat during the early 2000s, but the really large effects come from the enlargement of EU in 2004. By 2006 immigration has increased by roughly 12 percent and the second enlargement with Bulgaria and Romania increases immigration even further so that the effect in 2010 was around 20 percent. If we accumulate these effects up till 2010 we notice that immigration to Norway has increased by 77 000 as a consequence of these policies compared to a counterfactual situation where Norway did not join at all.

Table 8. Counterfactual analysis of immigration to Norway (139 countries). Simulation II[a]

Year	Reference path	Counterfactual path	Absolute difference	Difference in percent
1994	25,910	25,320	-590	-2.3
1995	24,614	23,682	-932	-3.8
1996	24,956	23,778	-1,178	-4.7
1997	29,708	28,311	-1,397	-4.7
1998	36,262	34,540	-1,722	-4.7
1999	38,055	36,343	-1,712	-4.5
2000	35,469	33,867	-1,602	-4.5
2001	37,714	35,542	-2,172	-5.8
2002	39,446	36,880	-2,566	-6.5
2003	40,109	37,321	-2,788	-7.0
2004	40,914	36,961	-3,953	-9.7
2005	43,504	37,148	-6,356	-14.6
2006	47,082	41,325	-5,757	-12.2
2007	59,315	52,136	-7,179	-12.1
2008	64,604	55,368	-9,236	-14.3
2009	67,920	53,186	-14,734	-21.7
2010	71,401	57,873	-13,528	-18.9
Sum	726,983	649,581	-77,402	-10.6

[a]The reference path corresponds to dynamic simulation starting in 1994 using the estimated parameters reported for the restricted case in Table 2. For the counterfactual path we set the values of the intervention variables *DUM1994*, *DUM2001A*, *DDUM2004* and *DUM2007EU* to zero in all years and perform dynamic simulation. The countries involved are listed in the last column of Table B2.

5. Conclusions

Using unbalanced panel data we have modelled immigration to Norway from countries all over the world during the period 1969–2010. Our main focus has been to assess the effects of immigration policies on immigration to Norway. Immigration policies have been proxied using a number of time series dummy variables. These policy intervention variables have been included in a standard economic model of migration that accounts for the effects of incentive variables such as relative income, income distribution and labour market features. Unobserved country-specific heterogeneity is modelled by including country specific fixed effects and country specific linear trends in order to take into account geographical distance, culture and language differences and other fairly stable effects that might affect migration from individual countries to Norway.

For the incentive variables we, abstracting from the income distribution variables, obtain estimates with the expected sign, even if the significance of some of the estimates is rather moderate. Even if many of the country-specific fixed effects and trend effects are insignificant, the presence of these variables seems to be important. When the country-specific trend effects are omitted a substantial drop in fit and less sensible estimates of the effects of the incentive variables are obtained. However, more parsimonious specifications of unobserved country-specific heterogeneity are a relevant topic for future research.

The majority of policy intervention variables enter with the a priori expected sign, but for some of them we obtain counterintuitive results. In a counterfactual exercise we have investigated the effect of the general immigration policies that have been launched since 1974. As a rough estimate we find that the accumulated number of immigrations over then period 1974-2010 would have been about 116 000 persons higher without these policies. In relative terms, the immigration would have increased with 12 per cent if one had pursued a policy without the general immigration interventions.

In another experiment we investigated the importance of Norway joining the European Economic Area in 1994 and the subsequent changes in immigration policy that followed from this step, that is the membership in the Schengen area and the enlargement of EU. Again as a rough estimate we found that the accumulated immigration over the time period 1994-2010 would have been 10 per cent lower without Norwegian involvement in the European Economic Area.

References

Borjas, G. J. (1987): Self-Selection and the Earnings of Immigrants, *American Economic Review*, 77, 531–553.

Cappelen, Å., J. Ouren and T. Skjerpen (2011): Effects of immigration policies on immigration to Norway 1969-2010, Reports 40/2011, Statistics Norway.

Carrington, W. J., E. Detragiache, and T. Vishwanath (1996): Migration with Endogenous Moving Costs, *American Economic Review*, 86, 909– 930.

Clark, X., T. J. Hatton and J. G. Williamson (2007): Explaining U.S. Immigration, 1971–1998, *The Review of Economics and Statistics*, 89, 359–373.

Hall, B.H. and C. Cummins (2005): *TSP Reference manual Version 5.0.* TSP International.

Hatton, T. J. (2005): Explaining trends in UK immigration, *Journal of Population Economics*, 18, 719–740.

Heston, A., R. Summers and B. Aten (2011): *Penn World Tables, Version 7.0*. Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania. March 2011.

Karemera, D., V. I. Oguledo, and B. Davis (2000): A gravity model analysis of international migration to North America, *Applied Economics*, 32, 1745–1755.

Kim, K. and J. E. Cohen (2010): Determinants of International Migration Flows to and from Industrialized Countries: A Panel Data Approach Beyond Gravity, *International Migration Review*, 44, 899–932.

Massey, D. S., J. Arango, G. Hugo, A. Kouaouci, A. Pellegrino and J. E. Taylor (1993): Theories of International Migration: A Review and Appraisal, *Population and Development Review*, 19, 431– 466.

Mayda, A. M. (2010): International Migration: A Panel Data Analysis of the Determinants of Bilateral Flows, *Journal of Population Economics* 23, 1249–1274.

Nickell, S.J. (1981): Biases in Dynamic Models with Fixed Effects. *Econometrica*, 49, 1417–1426.
Roy, A. D. (1951): Some Thoughts on the Distribution of Earnings, *Oxford Economic Papers*, 3, 135–146.

Appendix A: Additional estimation results

Table A1. Empirical analysis of immigration to Norway. Restricted specification. Weighted regression and OLS[a]

Explanatory variable	Weighted regression		Unweighted regression	
	Estimate	t-value	Estimate	t-value
$log(M/P)_{t-1}$	0.598	49.169	0.531	42.198
$log(IS/PNOR)_{t-1}$	0.030	2.315	0.047	3.617
$log(GDPCAP/GDPCAPNOR)_{t-2}$	-0.046	-1.413	-0.019	-0.586
$URNOR_{t-1}$	-0.059	-7.071	-0.048	-4.695
DUMCHILE	1.414	3.407	1.591	5.522
DUMLIBERIA	2.395	2.720	2.476	7.990
DUMSOMALIA	1.814	3.112	1.854	6.337
DNNORDIC×DDUM1974	-0.104	-3.694	-0.062	-1.480
DNNORDIC×DUM1977	-0.059	-2.148	-0.030	-0.795
DNNORDIC×DUM1981	0.075	3.354	-0.013	-0.441
DNNORDIC×DUM1991	-0.096	-3.593	-0.061	-1.845
DEEA×DUM1994	0.142	2.606	0.129	2.257
DREFUGEE×DUM1997	0.800	4.029	0.458	3.755
DNNORDIC×DUM1998	0.052	1.567	-0.005	-0.106
DNNORDIC×DUM1999	-0.189	-4.900	-0.052	-1.010
DNNORDIC×DUM2000A	-0.074	-1.953	-0.113	-2.205
DSCHENGEN×DUM2001A	0.140	2.059	0.111	1.612
DNNORDIC×(1-DSCHENGEN)×DUM2001B	0.144	4.823	0.061	1.484
DEXTEU×DDUM2004	0.900	6.271	0.759	10.113
DVIETNAM×DUM2005	0.146	1.243	0.057	0.323
DBULROM×DUM2007EU	0.502	2.129	0.525	2.932
DLIB×DUM2007B	0.073	2.487	-0.025	-0.602
DSTRICT×DUM2008	-0.189	-6.145	-0.099	-2.259
Number of observations	4,220		4,220	

[a]Left hand side variable $log(M/P)_t$. For the definition of the variables in the text column see Table B1. Weights based on population size.

Table A2. Empirical analysis of immigration to Norway from the entire world. Countries with fewer than 15 observations omitted. Weighted least squares estimates[a]

Explanatory variable	Full sample		Countries with more than 14 observations	
	Estimate	t-value	Estimate	t-value
$log(M/P)_{t-1}$	0.598	49.169	0.605	48.569
$log(IS/PNOR)_{t-1}$	0.030	2.315	0.028	2.095
$log(GDPCAP/GDPCAPNOR)_{t-}$	-0.046	-1.413	-0.048	-1.465
$URNOR_{t-1}$	-0.059	-7.071	-0.059	-6.948
DUMCHILE	1.414	3.407	1.402	3.327
DUMLIBERIA	2.395	2.720	2.388	2.670
DUMSOMALIA	1.814	3.112	1.794	3.032
DNNORDIC×DDUM1974	-0.104	-3.694	-0.105	-3.666
DNNORDIC×DUM1977	-0.059	-2.148	-0.057	-2.033
DNNORDIC×DUM1981	0.075	3.354	0.074	3.280
DNNORDIC×DUM1991	-0.096	-3.593	-0.092	-3.395
DEEA×DUM1994	0.142	2.606	0.140	2.518
DREFUGEE×DUM1997	0.800	4.029	0.794	3.941
DNNORDIC×DUM1998	0.052	1.567	0.053	1.581
DNNORDIC×DUM1999	-0.189	-4.900	-0.190	-4.805
DNNORDIC×DUM2000A	-0.074	-1.953	-0.074	-1.921
DSCHENGEN×DUM2001A	0.140	2.059	0.138	2.006
DNNORDIC×(1-DSCHENGEN)×DUM2001B	0.144	4.823	0.143	4.681
DEXTEU×DDUM2004	0.900	6.271	0.890	6.101
DVIETNAM×DUM2005	0.146	1.243	0.147	1.231
DBULROM×DUM2007EU	0.502	2.129	0.502	2.095
DLIB×DUM2007B	0.073	2.487	0.075	2.487
DSTRICT×DUM2008	-0.189	-6.145	-0.190	-6.013
Number of observations	4,220		3,956	
R^2	0.946		0.949	

[a]Left hand side variable $log(M/P)_t$. For the definition of the variables in the text column see Table B1. Note that some of the variables in the text column are redefined when one omits countries with less than 15 observations. For instance since Slovenia is omitted *DEXTEU* is one for Czech republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland and Slovakia.

Appendix B: Details on data

Table B1. An overview of intervention dummies, the countries that are influenced by the various policy dummies and the expected sign of the effects of the dummy variables[1]

Intervention dummies	Country/Country area dummies	Definition of country/country area dummies	Description of intervention	Expected sign
DDUM1974	*DNNORDIC*	*DNNORDIC* is 1 for all countries except Denmark, Finland, Iceland and Sweden.	Ban on general work permits introduced in February 1974. All countries.	Negative
DUM1977	*DNNORDIC*		Residence permits not granted to illegally entrants.	Negative
DUM1981	*DNNORDIC*		Residence permits for immigrant students and school attendants. They were also given work permits. More liberal rules for family reunions.	Positive
DUM1991	*DNNORDIC*		Easier family reunion, work permits given to applicants for residence.	Positive
DUM1994	*DEEA*	*DEEA* is one for Austria, Belgium, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain and United Kingdom	Norway joins the EEA. EEA-citizens free access.	Positive
DUM1997	*DREFUGEE*	*DREFUGEE* is one for Afghanistan, Iraq, Somalia and for countries in former Yugoslavia.	Liberalisation related to the Geneva-convention. Refugees.	Positive
DUM1998	*DNNORDIC*		Liberalisation for refugees.	Positive
DUM1999	*DNNORDIC*		New law on human rights. UN convention on women and children.	Positive
DUM2000A	*DNNORDIC*		Easier access for people with specialist competence.	Positive
DUM2000B	*DIRAQ*	*DIRAQ* is 1 for Iraq	Easier access for people from Iraq.	Positive
DUM2001A	*DSCHENGEN*	*DSCHENGEN* is one for Austria, Belgium, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain	Schengen-convention. Liberalisation for Schengen member countries.	Positive
DUM2001B	*(1-DSCHENGEN)* DNNORDIC*		Schengen-convention. Possible tigthening for countries outside the Schenger-area.	Negative

Table B1 (Cont.)

Intervention dummies	Country/Country area dummies	Definition of country/country area dummies	Description of intervention	Expected sign
DDUM2003	*DREFUGEE*	*DREFUGEE* is one for Afghanistan, Iraq, Somalia and for countries in former Yugoslavia.	Liberalisation in 1997 tightened in 2003.	Negative
DDUM2004	*DEXTEU*	*DEXTEU* is one for Czech republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.	Extension of EU	Positive
DUM2005	*DVIETNAM*	*DVIETNAM* is one for Irag and Philippines	Easier access for Vietnamese refugees to the Philippines and Iraq.	Positive
DUM2006	*DVISA*	*DVISA=(1-DEEA)*(1-DEXTEU)* DNNORDIC*	More restrictive rules for family reunion for immigrants arriving on tourist visa from non-EU countries.	Negative
DUM2007EU	*DBULROM*	*DBULROM* is one for Bulgaria and Romania	New EU members	Positive
DUM2007A	*DEXTEU*	See *DDUM2004*	New EU members in 2004 included in Schengen area	Positive
DUM2007B	*DLIB*	*DLIB=(1-DEEA)*(1-DEXTEU)* (1-DBULROM)*DNNORDIC*	Residence given for asylum seekers not able to return	Positive
DUM2008	*DSTRICT*	*DSTRICT=(1-DEEA)*(1-DEXTEU)* (1-DSWI)*DNNORDIC*, where *DSWI* is one for Switzerland and 0 otherwise	Stricter economic demands for family reunion.	Negative
DUM2009A	*DTRANS*	*DTRANS* is one for Czech republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.	Temporary transition rules applying to new (from 2004) EU members lifted (except Cyprus and Malta)	Positive
DUM2009B	*DSWI*		Switzerland joins the Schengen-area	Positive

[1] *DUMj* (j=1977, 1981, 1991, 1993, 1994, 1997, 1998, 1999, 2000A, 2000B, 2001A, 2001B, 2005, 2006, 2007EU, 2007A, 2007B, 2008, 2009A, 2009B) is a dummy variable that is 0 before the year indicated and 1 from this year on. *DDUM1974* is a dummy variable that is 0 before 1974, equal to 0.917 (≈11/12) in 1974 and 1 from 1975 on. *DDUM2003* is zero before 2003, 0.5 in 2003 and 1 in the years thereafter. *DDUM2004* is zero before 2004, 0.67 (≈2/3) in 2004 and 1 in the years thereafter.

Table B2. The number of observations by countries in different cases

Country	Current number	Number of observations	Are timeseries for Gini-index available?	Is the country involved in simulation experiment I?	Is the country involved in simulation experiment II?
Afghanistan	1	23	No	Yes	Yes
Albania	2	19	Yes	No	Yes
Algeria	3	39	Yes	Yes	Yes
Angola	4	24	No	No	Yes
Argentina	5	42	Yes	Yes	Yes
Armenia	6	11	Yes	No	Yes
Australia	7	42	Yes	Yes	Yes
Austria	8	42	Yes	Yes	Yes
Azerbaijan	9	13	Yes	No	Yes
Bahrain	11	10	No	No	Yes
Bangladesh	12	35	Yes	No	Yes
Belarus	14	17	Yes	No	Yes
Belgium	15	42	Yes	Yes	Yes
Benin	17	5	No	No	No
Bhutan	18	14	No	No	Yes
Bolivia	19	37	Yes	Yes	Yes
Bosnia Herzegovina	20	18	No	No	Yes
Botswana	21	33	Yes	No	Yes
Brazil	22	42	Yes	Yes	Yes
Brunei	23	9	No	No	Yes
Bulgaria	24	35	Yes	Yes	Yes
Burundi	26	11	No	No	Yes
Cambodia	27	12	Yes	No	Yes
Cameroon	28	35	Yes	No	Yes
Canada	29	42	Yes	Yes	Yes
Cape Verde	30	14	No	No	Yes
Chile	33	39	Yes	Yes	Yes
China	34	42	Yes	Yes	Yes
Colombia	35	39	Yes	Yes	Yes
Congo	37	39	No	Yes	Yes
Congo Brazzaville	38	33	No	No	Yes
Costa Rica	39	33	Yes	No	Yes
Cote Divoire	40	35	Yes	No	Yes
Croatia	41	18	Yes	No	Yes
Cuba	42	17	No	No	Yes
Cyprus	43	26	Yes	No	Yes
Czech Republic	44	17	Yes	No	Yes
Denmark	45	42	Yes	Yes	Yes
Dominican Republic	47	32	Yes	No	Yes
Ecuador	48	35	Yes	No	Yes
Egypt	49	42	Yes	Yes	Yes
El Salvador	50	10	Yes	No	Yes
Eritrea	52	16	No	No	Yes
Estonia	53	19	Yes	No	Yes
Ethiopia	54	42	No	Yes	Yes
Finland	56	42	Yes	Yes	Yes
France	57	42	Yes	Yes	Yes
Gambia	59	35	No	No	Yes
Germany	61	39	Yes	Yes	Yes
Ghana	62	39	No	Yes	Yes
Greece	63	42	Yes	Yes	Yes
Guatemala	65	31	Yes	No	Yes
Guinea	66	10	Yes	Yes	Yes
Guyana	68	2	No	No	No
Honduras	70	11	Yes	No	Yes

Table B2 (Continued)

Country	Current number	Number of observations	Are timeseries for Gini-index available?	Is the country involved in simulation experiment I?	Is the country involved in simulation experiment II?
Hong Kong	71	42	Yes	Yes	Yes
Hungary	72	39	Yes	Yes	Yes
Iceland	73	42	No	Yes	Yes
India	74	42	Yes	Yes	Yes
Indonesia	75	42	Yes	Yes	Yes
Iran	76	42	Yes	Yes	Yes
Iraq	77	24	No	No	Yes
Ireland	78	42	Yes	Yes	Yes
Israel	79	42	Yes	Yes	Yes
Italy	80	42	Yes	Yes	Yes
Jamaica	81	28	Yes	Yes	Yes
Japan	82	42	Yes	Yes	Yes
Jordan	83	26	Yes	Yes	Yes
Kazakhstan	84	13	Yes	No	No
Kenya	85	42	Yes	Yes	Yes
Kuwait	86	20	No	No	Yes
Kyrgyzstan	87	7	Yes	No	No
Laos	88	12	No	No	Yes
Latvia	89	19	Yes	No	Yes
Lebanon	90	39	No	Yes	Yes
Liberia	92	26	No	Yes	Yes
Libya	93	35	No	Yes	Yes
Lithuania	94	19	Yes	No	Yes
Luxembourg	95	35	Yes	No	Yes
Macao	96	10	No	No	No
Macedonia	97	16	Yes	No	Yes
Madagascar	98	35	Yes	No	Yes
Malawi	99	11	Yes	No	Yes
Malaysia	100	35	Yes	No	Yes
Mali	102	24	Yes	No	Yes
Malta	103	19	No	No	Yes
Mauritius	105	14	Yes	No	Yes
Mexico	106	42	Yes	Yes	Yes
Moldova	108	11	Yes	No	Yes
Mongolia	109	13	No	No	Yes
Morocco	111	39	Yes	Yes	Yes
Mozambique	112	28	No	No	Yes
Namibia	113	18	No	No	Yes
Nepal	114	34	No	Yes	Yes
Netherlands	115	42	Yes	Yes	Yes
New Zealand	116	42	Yes	Yes	Yes
Nicaragua	117	24	Yes	No	Yes
Nigeria	119	40	Yes	Yes	Yes
Oman	121	26	No	No	Yes
Pakistan	122	39	Yes	Yes	Yes
Paraguay	125	29	Yes	Yes	Yes
Peru	126	39	Yes	Yes	Yes
Philippines	127	42	Yes	Yes	Yes
Poland	128	39	Yes	Yes	Yes
Portugal	129	42	Yes	Yes	Yes
Qatar	131	35	No	No	Yes
Romania	132	33	Yes	Yes	Yes
Russia	133	18	Yes	No	Yes
Rwanda	134	19	No	No	Yes
Saudi Arabia	137	34	No	No	Yes
Senegal	138	18	Yes	No	Yes
Sierra Leone	140	30	No	No	Yes

Table B2 (Continued)

Country	Current number	Number of observations	Are timeseries for Gini-index available?	Is the country involved in simulation experiment I?	Is the country involved in simulation experiment II?
Singapore	141	35	Yes	No	Yes
Slovakia	142	17	Yes	No	Yes
Slovenia	143	7	Yes	No	Yes
Somalia	145	27	No	No	Yes
South Africa	146	42	Yes	Yes	Yes
South Korea	147	39	Yes	Yes	Yes
Spain	148	42	Yes	Yes	Yes
Sri Lanka	149	35	Yes	No	Yes
Sudan	152	36	No	Yes	Yes
Swaziland	154	6	No	No	Yes
Sweden	155	42	Yes	Yes	Yes
Switzerland	156	42	Yes	Yes	Yes
Syria	157	29	No	No	Yes
Tajikistan	158	6	Yes	No	No
Tanzania	159	42	Yes	Yes	Yes
Thailand	160	39	Yes	Yes	Yes
Togo	162	16	No	No	Yes
Trinidad and Tobago	164	30	No	No	Yes
Tunisia	165	39	Yes	Yes	Yes
Turkey	166	42	Yes	Yes	Yes
Uganda	168	33	Yes	Yes	Yes
Ukraine	169	18	Yes	No	Yes
United Arab Emirates	170	25	No	No	Yes
United Kingdom	171	42	Yes	Yes	Yes
United States	172	42	Yes	Yes	Yes
Uruguay	173	20	Yes	Yes	Yes
Uzbekistan	174	10	Yes	No	Yes
Venezuela	176	40	Yes	Yes	Yes
Vietnam	177	34	Yes	Yes	Yes
Yemen	178	12	Yes	No	Yes
Zambia	179	38	Yes	Yes	Yes
Zimbabwe	180	31	No	Yes	Yes
Serbia and Montenegro	185	19	No	No	Yes
Total		4,220			

Table B3. Countries included in estimations involving the origin unemployment rate[1]

Country	Current number
Australia	7
Austria	8
Belgium	15
Canada	29
Czech Republic	44
Denmark	45
Estonia	53
Finland	56
France	57
Germany	61
Greece	63
Hungary	72
Icelanda	73
Ireland	78
Israel	79
Italy	80
Japan	82
Luxembourg	95
Mexico	106
Netherlands	115
New Zealand	116
Poland	128
Portugal	129
Slovakia	142
South Korea	147
Spain	148
Sweden	155
Switzerland	156
Turkey	166
United Kingdom	171
United States	172

[1]In the estimation where both the Gini ratio variable and the origin unemployment rate are used as regressors. Iceland is omitted since one does not have access to a time series of Gini coefficents for this country.

Table B4. Countries omitted from the econometric analyses and their total number of immigrants to Norway 1967–2010

Country	Current number	Total number of immigrants 1967–2010
Bahamas	10	76
Barbados	13	68
Belize	16	20
Burkina Faso	25	52
Central African Republic	31	9
Chad	32	32
Comoros	36	6
Djibouti	46	88
Equatorial Guinea	51	30
Fiji	55	62
Gabon	58	124
Grenada	64	38
Guinea Bissau	67	41
Haiti	69	49
Lesotho	91	72
Maldives	101	58
Mauritania	104	33
Micronesia	107	9
Niger	118	86
Panama	123	131
Papua New Guinea	124	39
Puerto Rico	130	13
Samoa	135	20
Sao Tome and Principe	136	2
Salomon Islands	144	6
St. Lucia	150	13
St. Vincent and the Grenadines	151	12
Suriname	153	46
Timor Leste	161	33
Tonga	163	18
Turkmenistan	167	50
Vanuatu	175	3

Appendix C. Description of migration policy dummies

In 1957 a law concerning foreigners was passed ("Fremmedloven"), basically enacting a liberal regime for immigration to Norway. One could come to Norway without a work permit and apply for the permit after having arrived. There was no assessment of skill requirements for work, and after two years of residence you were granted permanent residence permit. In 1971 this law was slightly modified. A potential immigrant had to apply for work before coming to Norway and had to have arranged for some kind of accommodation before a permit was granted.[27] In 1975 this rather liberal regime was formally modified by the introduction of new regulations based on the 1957 law. Changes took place in how the law was enforced, and included a ban on general work permits: the employers now had to confirm that the immigrant was a specialist, the work had to last at least one year, and the immigrant had to be literate (in his or her mother tongue). However, there were also some elements of liberalisation relating to possibilities of family reunions. We introduce a policy dummy for this change specified as a step dummy since this change has been in effect ever since. There were preliminary changes introduced in February 1974 and formally made in 1975 so the variable *DDUM1974* is zero until 1973 and 1 for the years 1975–2009 and roughly 0.9 in 1974. In principle all (non-Nordic) countries are affected by the dummy and we expect the estimated effect of the policy change to be negative.

In 1977 a change in a regulation was introduced stating that residence would not be granted to persons entering Norway illegally. We expect *DUM1977* (that is zero before 1977 and one thereafter) to enter with a negative sign. In 1981 a number of minor changes to immigration rules were introduced that generally made it easier for immigrants to enter and stay. Foreigners coming to Norway to study or go to school would be granted a residence permit and foreign students were also given a work permit. When studies had been completed it was made easier for foreigners to remain and work in Norway. A step dummy (*DUM1981*) is introduced, taking on the value of one from 1981 being zero before that year. We expect the effect of this dummy to enter with a positive sign.

In 1991 a number of minor changes in how immigration policies were practised took place. Family reunion was made easier and immigrants without a residence permit were granted a residence permit while the application was considered. Some minor changes were of a more restrictive nature, but all in

[27] In line with the policy dummies introduced in this section one could ask why we have not tried to estimate any effect of the 1971 change in regulations. The answer is that we have tried but the result was that the estimated coefficient had the wrong sign and was also insignificant perhaps due to few observations before 1971. This result is available upon request.

all we expect these changes captured by *DUM1991* to have a positive effect on immigration from 1991 and onwards.

Norway joined the European Economic Area (EEA) in 1994. In practice this meant that citizens of the EU gained free access to work in Norway for three months or to stay for six months as job-seekers, as well as getting in principle the same social benefits as Norwegian citizens. Although there was a time limit to the length of residence without obtaining a residence permit, there were in practice unlimited possibilities for extensions. We expect *DUM1994* to enter with a positive sign for all members of the EEA.

In 1997 a liberalisation took place in accordance with the Geneva-convention on how refugees should be handled by the immigration authorities in Norway. The changes were related to immigrants from countries in civil war. *DUM1997* is not expected to affect many countries and therefore not to be important for overall immigration but is expected to enter with a positive sign.

Another liberalisation took place in 1998 affecting people who are persecuted in their home country for various reasons. The rules regarding refugees were to be interpreted in a more liberal way. We expect *DUM1998* to affect immigration to Norway positively and (in principle) affect all countries.

In 1999 the UN convention on children and women was made part of the Norwegian legislation. In addition work permits were given for different lengths of time and did not expire automatically after two years. All these changes are expected to lead *DUM1999* to enter with a positive sign. The changes are expected to affect all countries.

In 2000 a liberalisation took place relating to work permits for specialists with competences that are in excess demand in the Norwegian labour market. *DUM2000A* is expected to enter with a positive sign. Also Iraqis were granted easier access to Norway captured by *DUM2000B*.

In 2001 Norway joined the Schengen agreement that identifies countries covered by a common policy for issuing short term visitors' visa that are valid for all visits to all countries that are party to the convention. It also extends the area where as a citizen of a member country you do not need a passport to enter one of the other member countries (but you may need another form of identity document). The Schengen agreement covers most members of the EU as well as all EFTA countries, but not all member countries joined in 2001. The convention may have limited immigration to Norway for some non-

Schengen countries. We capture the effect of the Schengen agreement by two intervention dummies, labelled *DUM2001A* and *DUM2001B*. The former is directed to the Schengen countries, whereas the latter is directed towards the countries outside the Schengen area. A priori we expect *DUM2001A* to enter with a positive effect and *DUM2001B* with a negative effect.

The liberalisation of 1997 was partly reversed in May 2003. Former asylum applicants had previously been exempted from the requirement to provide for family member applying for a residence permit. From 2003 this exemption would no longer apply to those families whose reference person had been granted a residence permit on humanitarian grounds following an asylum application, as long s/he had not yet been granted a permanent residence permit. In practice this tightening of rules applied mainly to immigrants from Afghanistan, Iraq, Somalia and former Yugoslavia, although in theory it is more general. So *DDUM2003* is zero before 2003, equal to one half in 2003 and one thereafter, and is expected to enter with a negative sign.

In 2004 a number of countries joined the EU and citizens of these countries then also gained easier access to Norway. Some transition rules were put in place (lifted in 2007 and 2009) but it seems that in practice they limited immigration only marginally. Thus, *DDUM2004* affects only the new members of the EU from that year and is expected to affect immigration from these countries positively.
In 2005 two changes in policy were introduced, enabling Iraqis and Vietnamese boat refugees (or near relatives) living in the Philippines easier access to Norway. Hence *DUM2005* only applies to Iraq and The Philippines.[28] The dummy is expected to affect immigration from these two countries positively.

A more restrictive policy was introduced in 2006. Foreigners who had arrived on tourist visa and then applied for family reunion were now less likely to be granted residence. This applied in principle to all countries and *DUM2006* is expected to enter with a negative sign.

In 2007 a number of changes in regulations affecting potential immigrants from EEA countries as well as more generally were made. The new EU members in 2004 were included in the Schengen area. This is captured by the dummy *DUM2007A*. Bulgaria and Romania became members of the EU but with some restrictions on access to Norway (parallel to those imposed on new EU-members in 2004). The effect of this is captured by *DUM2007EU*. Asylum seekers whose application was rejected and who had not managed to return within 3 years, from no fault of their own, could be granted a residence

[28] Note that because our statistics are for country of previous residence, not citizenship the dummy applies to the Philippines and Iraq and not Vietnam.

permit. We expect *DUM2007B* to enter with a positive sign and apply to all countries except the EU and EEA countries. All these dummies are expected to enter with a positive sign.

2008 saw a tightening of rules related to family reunion when authorities made it more difficult for family members to enter if the ability to provide for the family was not met. *DUM2008* is expected to enter with a negative sign.

Finally in 2009 transitional restriction affecting the countries that joined EU in 2004 (except Cyprus and Malta) are lifted and the *DUM2009A* is expected to enter with a positive sign but to affect only citizens of those countries. In 2009 Switzerland joins Schengen and this is captured by *DUM2009B*.[29]

[29] The Norwegian implementation of the EU Free Movements Directive from 1. October 2009, cf. Footnote 1, was too late to be included in this analysis.

B

Returadresse:
Statistisk sentralbyrå
NO-2225 Kongsvinger

Statistics Norway

Oslo:
PO Box 8131 Dept
NO-0033 Oslo
Telephone: + 47 21 09 00 00
Telefax: + 47 21 09 00 40

Kongsvinger:
NO-2225 Kongsvinger
Telephone: + 47 62 88 50 00
Telefax: + 47 62 88 50 30

E-mail: ssb@ssb.no
Internet: www.ssb.no

ISSN 0809-733X

Statistisk sentralbyrå
Statistics Norway