

A General Method for Estimating the Number of Unauthorised Immigrants Using Standard Data Sources

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What is required

- In principle, the method is applicable to any country with:
 - Time series on inflows of authorised migrants, the longer the better
 - A data source which covers, in principle, all immigrants, both authorised and unauthorised
 - Population censuses or household surveys
 - Statistic required is the number of immigrants by year of entry
 - And ... not too many or too serious data quality / reliability problems

An example to illustrate the « residual method »:

Suppose the outflow rate for all immigrants is 2% of the stock per year.

year	Population of authorised immigrants at beginning of year	Outflow of authorised immigrants	Inflow of authorised immigrants	Population of authorised immigrants at end of year	Average duration of presence at end of year (years)
	A	$B=0,02 * A$	C	A-B+C	
2001	0	0	1 058 902	1 058 902	0,50
2002	1 058 902	21 178	1 059 356	2 097 080	0,99
2003	2 097 080	41 942	703 542	2 758 680	1,61
2004	2 758 680	55 174	957 883	3 661 390	2,06
2005	3 661 390	73 228	1 122 257	4 710 419	2,45
2006	4 710 419	94 208	1 266 129	5 882 340	2,82
2007	5 882 340	117 647	1 052 415	6 817 108	3,30
2008	6 817 108	136 342	1 107 126	7 787 892	3,76
2009	7 787 892	155 758	1 130 818	8 762 952	4,21
2010	8 762 952	175 259	1 042 625	9 630 318	4,70
Total		870 735	10 501 053		

If in 2010, our survey /census tells us that 11 million immigrants entered since 2001 and were still present at end-of-year 2010, then there were $11\,000\,000 - 9\,630\,318 = 1\,369\,682$ unauthorised immigrants who entered over the period and were still present end-of-year 2010.

Therefore, to estimate the number of unauthorised immigrants who entered over a specified period and were still present at the end of the period, we need:

- The number of authorised immigrants who entered over the period
- The number of these who left over the period (by means of the outflow rate)
- The number of total immigrants who entered over the period and were still present at the end of the period

Note also that both the stock and the duration of residence of authorised immigrants are functions of the inflows and the outflow rate.

The methodology

- What we have
 - Total authorised inflows by year
 - Total number of immigrants (=S)
 - Average duration of presence of all immigrants (=d)
 - a=authorised, u=unauthorised
- What we have to do => express both S_a and d_a as functions of the inflows and the outflow rate (=o)
- What we solve → 2 equations with two unknowns (p_u and o), by assigning specific values of d_u/d_a , the duration ratio (=r).

- $S_a = S * (1 - p_u)$ stock (1)

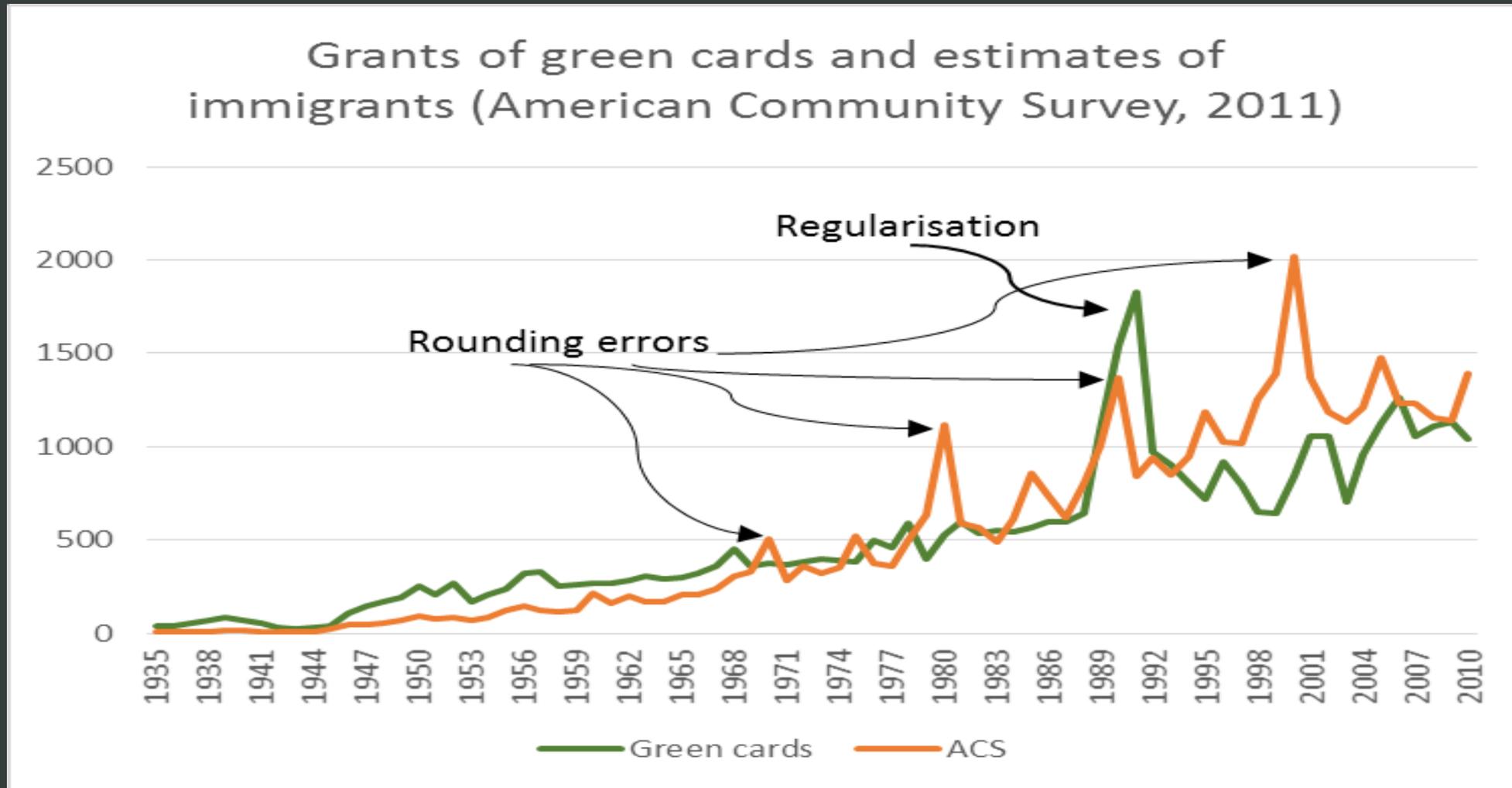
- $d = p_a * d_a + p_u * d_u$ average duration

Rearranging yields:

- $d_a = d / (1 - p_u + p_u * d_u/d_a)$ (2)

third unknown

An example: the United States



- Source: DHS Yearbook of Immigration Statistics, Table 1
- Stock of immigrants 2010 = 39 955 854 \leftrightarrow Sum of green cards 1931-2010 = 38 637 335

Some estimates for the United States for 2010

Entry period of unauthorised	Duration ratio d_u/d_a	Estimate of unauthorised (000s)
In 2010	0	5 148
Last 15 years	0,39	6 798
Last 22 years	0,55	7 774
Last 30 years	0,68	8 733
Last 75 years	1	12 100

- « r » values proxied by average duration estimates for all immigrants for a subset (e.g. 15 years) of the full entry period (75 years) relative to that for the full period.
- Poor agreement with « official » estimates → 11 384 K
- Why? → Grants of green cards are not entries; for this to work, one needs to have year of entry of persons granted green cards, to line up with stock data by year of entry.

Adjusting for the fact that green cards are not entries

- Allow recipients to arrive for up to six years before they received their green cards
- Estimate the proportion who entered in the receiving year and each of the six previous years by maximising the correlation (over entry years) between the estimated authorised inflows still present and the observed number of immigrants present from the census / household survey.
- Revised estimates:

Entry period of unauthorised	Duration ratio d_u/d_a	Estimate of unauthorised (000s)
All at once	0	7 066
Last 15 years	0,39	9 623
Last 22 years	0,55	11 177
Last 30 years	0,68	12 829
Last 75 years	1	18 158

What other data problems can arise?

- The inflows in this case cover only permanent immigrants, but the census / household stock may include some temporary migrants, who will then « appear » as unauthorised → overestimation
- The census / household survey may be subject to undercoverage, which would result in an underestimate of the unauthorised.

These effects are thus offsetting, to a certain (unknown) extent.

- The rate of outflow of the authorised may vary over time (for example, due to a change in policy which results in more immigrants returning to their country of origin), which will affect the estimate of the unauthorised.
- Moral of this tale → one cannot apply this method blindly.
 - And it may be possible to take into account each of the above in the estimation.

Is the methodology applicable to other countries? →

Yes

- Need a data source which covers (in principle) the unauthorised → census or LFS.
- Need flow data which line up with stock data → presence of regularisations/changes of status in flows results in downward bias in estimate of unauthorised, unless there is info on their year of entry
- Does not require 75 years of entry data => the same methodology can be applied to stock and duration data starting from a recent date in the past => for example, one could estimate the unauthorised who arrived within the past twenty years, with inflow data for the 20 years and stock and duration-of-residence data for persons present less than 20 years.
- Possibility of one methodology applicable to all countries, using standard data sources.
- Does not yield a point estimate (so far), but can provide a good indication of the size of the unauthorised immigrant population.

Thank you for your attention.

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Preliminary write-up of the
methodology on LinkedIn