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Immigration and Crime in Spain, 1999-2006
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Abstract:

Crime in Spain is not high, by European standards, but together with immigration, crime rates have increased significantly in the last decade. The goals of this paper are (i) to evaluate empirically the extent to which there is either a negative or a positive correlation between crime and immigration and, (ii) to provide a preliminary assessment of the extent to which a causal mechanism can be identified. We find that both immigrants and natives have contributed to the increase in the crime rate. However, the contribution of immigrants seems to be relatively higher. This result is partly explained by the fact that immigration has contributed to the main increase of the collective of males aged 20 to 50, which are responsible for most offences, and by differences in socioeconomic opportunities between migrants and natives. After controlling for such differences, being an immigrant still plays a significant role, but its estimated effect is diminished and the gradual decrease in the crime rates for each nationality appears to indicate a lower propensity to commit criminal offences among the newly-arrived immigrants. We find significant differences in the behavior of immigrants towards crime by their nationality of origin. The crime gap between immigrants and natives is moderate, and can be largely explained by a higher propensity of immigrants to commit minor offences. This type of crimes, although being the less serious, generates a strong perception of insecurity among native population, but its number has decreased in recent years.

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1. Introduction

Immigration and crime are intrinsically interconnected in the pop culture of the Spanish media as in many other countries. Newspapers report everyday how certain criminal acts are committed by immigrants. Even political parties take this issue as a serious matter that justifies changes in policies. Opinion polls reflect that a significant part of the population considers immigration an important problem and relates immigration to crime. According to an opinion poll published by the newspaper *El Mundo*, over two thirds of the population (66%) think there is a relation between immigration and public un-safety (*El Mundo*, newspaper, August 18th, 2008). Naturally the relationship between crime and immigration is neither new nor confined to Spain. However, what is unclear is the extent to which such relationship in fact exists beyond anecdotal episodes and relatively cavalier statistical interpretations of pre-selected data.

According to economic standard models of crime, as the one proposed by Becker, 1968 and Polinsky and Shavell, 2000 immigrants may undercomply with the law more frequently than natives, if their benefits of crime are higher or their costs are lower. Benefits and costs of crime could be different from that of natives: difficulties in the labor market and lack of economic opportunities (Bianchi, Buonanno and Pinotti, 2008); ethnical homogeneity as a mechanism of control and quality assurance (Garoupa, 2007); different costs of undercompliance due to distinctive cultural perceptions (Dharmapala and Garoupa 2004; McAdams 2000); or even less knowledge of local laws, can affect the costs and benefits of committing a crime and explain the differences in crime rates (Garoupa, 1997). Only a serious and rigorous empirical analysis can decide if that profile does actually prevail in reality.

The goal of this paper is to use Spain as a case study to (i) evaluate empirically the correlation between crime and immigration and, (ii) provide a preliminary assessment of the extent to which a causal mechanism - such as "ceteris paribus, being an

immigrant makes an individual more likely to perpetrate crimes" – can be identified. We answer (i) in the positive and (ii) in the negative.

In the first part of the paper, Section 2, we intend to perform a comprehensive description of crime in Spain. Our results are summarized in the following.

When compared to other European countries, the crime rate in Spain cannot be considered particularly high. The notable exception is theft-related crime, for which Spain is second only to France. But the prominence of France and Spain can be explained observing that tourists are often the passive targets of theft-related crimes, and that Spain and France can have large populations of tourists.

The available statistics for Spain make it possible calculate the crime rate in accordance with the number of arrested and convicted persons, two different sources of information which complement each other, as it is possible to know the nationality of the arrested persons and the province of origin of the convicted persons. Using both sources, we have evidence that the crime rate in Spain has increased from 2000 to 2006 from 2.4 to 3.2 per thousand inhabitants in terms of convicted persons, and from 5.2 to 6.3 per thousand inhabitants in the case of arrested persons. These increases are not negligible when compared to other European countries.

It is worth noting that the crime rate has not increased steadily, but has experienced sudden changes over the period under study. The most important of these changes took place in 2003, when bodily harm conducts were no longer considered to be a minor but a criminal offence. In fact, if we follow in detail the evolution of different types of crimes during this period, the greatest growth is precisely related to this type of offences against persons, while offences against property have experience a slight decrease in numbers.

Crime rates of immigrants are substantially higher than those of natives. Although those differences are still true today, they have been substantially reduced in the last few years: the gap between their respective rates (in terms of per 1000 inhabitants) is now close to 19 points, when using the data available for arrested persons.

When looking in closer detail at the role of foreign population in the growth of crime rates, the first thing that draws attention is that both groups, immigrants and natives, have contributed to its growth. More specifically, 32 percent of the crime rate growth can be attributed to natives committing a greater number of offences, while a 48 percent can be attributed to the arrival of immigrants with higher crime rates than natives. If we examine in detail the number of committed offences, we can observe that the arrival of immigrants have resulted in a lack of progress in the reduction of offences against property and in a minor increase in the number of offences against Collective Security (i.e. drugs and trafficking). In the case of natives, their contribution to the increase in the crime rate is primarily concentrated in offences against persons. Although this type of offence is increasing at a faster rate among immigrants than natives, when we compare the population growth of both groups in the last few years, its growth is particularly significant among natives. This can be mostly attributed to the more intense prosecution of this type of offences, rather than to increasing crime rates among natives.

Further analysis of the (partial) contribution of immigrants to the growth of the crime rate in Spain reveals that, in particular, foreigners from African countries have made a significant contribution to the increase in the number of drug and property related offences. For the rest of immigrants, it appears to exist a certain link between country of origin and type of offences, although this not particularly significant. In any case, the gradual decrease in the crime rates for every nationality appears to indicate a lower propensity to commit criminal offences among the newly-arrived immigrants.

In the period under study, we also find an increase in the number of minor offences (misdemeanours), but a decrease in the number of arrested persons for this type of offences. This is the result of an increase in the number of minor offences against property, which usually have relatively low rates of resolution and detainment. For this type of minor offences, foreigners show a significant higher crime rate than natives, especially in the case of foreigners from Algeria and Romania. The incidence of minor offences against property among natives have significantly decreased in the period.

In this work we also attempt to elucidate the reasons behind the differences between the criminal rates of immigrants and natives. More particularly, we want to assess whether these differences are due to the fact that immigrants find themselves in a social and economic situation where the propensity to commit an offence is higher, or whether

they can be attributed to cultural factors. From the data available about homicides, a type of criminal offence easy to compare between both groups, we find that both factors are relatively significant.

In the second part of the paper, section 3, we focus on property crimes and minor crimes. Our econometric results confirm the conclusions of the descriptive analysis: crime rate and immigrants' share are positive and significantly correlated, even after controlling for all observed socioeconomic and demographic factors. Controlling for socioeconomic and demographic factors, which capture differences among natives and immigrants that potentially affect the propensity towards crime, the effect of the immigrants' share is reduced but it is still significant.

The econometric analysis of section 3 provides an an assessment of the effect of immigration on the crime rate that parallels the findings of our descriptive analysis: immigration matters in order to explain the crime rate, but its importance should not be overstated. Age reveals as the main channel through which immigration has led to an increase in the crime rate. In particular, the fact that immigration tends to increase the weight of males aged 20 to 50 in Spanish population, which is the group more prone to commit crime, is behind the significant effect of the immigrants' share.

A further econometric exercise shows that even after controlling for socioeconomic factors, a differential in crime rates between native and immigrants remains. Our estimates indicate that higher proportions of American, non-UE European, and African immigrants tend to widen the crime differential, with the estimated effect being largest for the latter ones.

2. Immigration and crime in Spain.

2.1 The evolution of the crime rate in Spain, 2000-2006

The crime rate (CR) is calculated as the ratio of number of offences to total population. It is also the most appropriate variable to measure the evolution of crime incidence when there has been a significant population growth (as it has been the case of Spain for the last few years), because this population increase is taken into account in this

measure, thus showing whether the increase in the number of offences has been offset or not by the population growth.

During an episode of substantial population growth, it can be expected a corresponding increase in the number of committed offences. Notwithstanding, the main matter of concern is whether the increase in crime incidence exceeds the population growth rate or not.

When comparing with neighbouring countries, the crime rate in Spain is not particularly high, fluctuating from 50 to 60 offences per thousand inhabitants for the year 2006. (See Figure 1)[2].

Fig. 1. UE 15 Crime Rates, 2006

Source: Eurostat
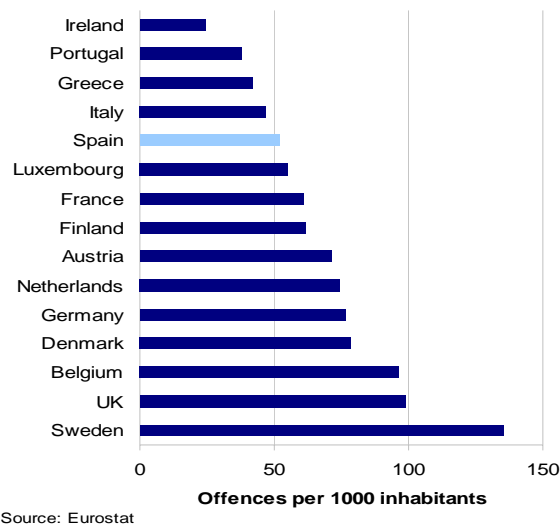
If we focus our attention in some of the most standardised offences, like homicide and theft (see Figures 2 and 3), which can be regarded as more comparable across countries, Spain is ranked at an average position in relation to homicides, but ranks close to the top in terms of theft. In the last case, it is just behind France, the other main tourist destination in the EU15. For this reason, it can be argued that a more accurate

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[2]It is difficult, though, to compare crimes between different countries. A particular behavior like drug consumption is considered to be an offence in some countries while not in others. Likewise, certain acts can be considered minor offences while in other countries are prosecuted as criminal offences, eliciting different judicial responses and sentences. Despite these differences, international comparisons are still useful as a point of reference for our work.

picture would require calculating theft-rates using as not only nationals, but also tourists, who are often the passive victims of these petty crimes, as population of reference. An alternative would be to subtract the number of theft-related crimes suffered by tourists to the total.

Fig. 2 and 3: UE Rates of Homicide and Theft (respectively), 2006

Source: Eurostat

Source: Eurostat
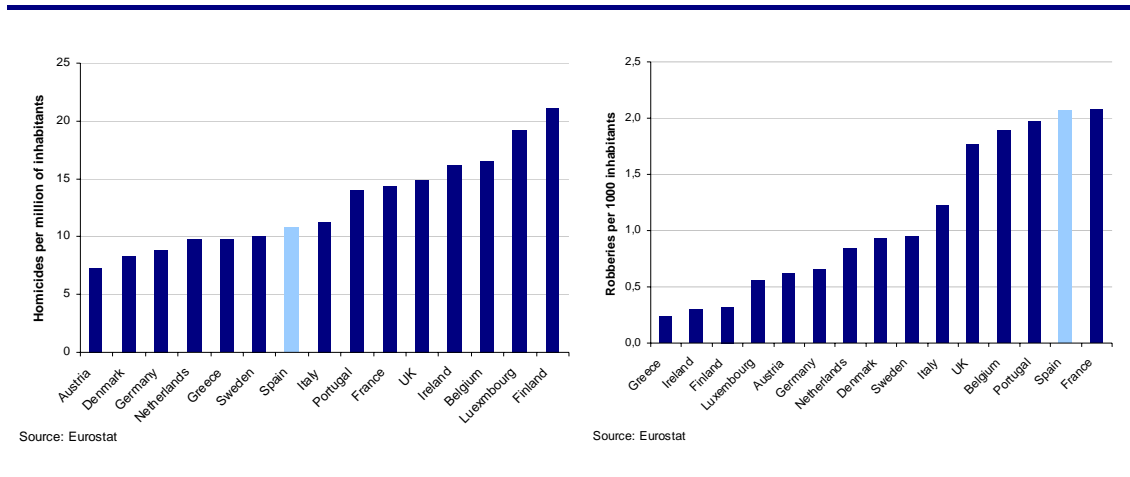
The available data for Spain make it possible to estimate the crime rates in relation to the number of arrested and convicted persons. These represent two complementary sources of information: on the one hand, the data for arrested persons provides us with information about the nationality of likely offenders and, on the other, the data for convicted persons indicates the province in which the criminal offence took place (there are also other important differences which will be explained below). Both sources of information reveal the growth of crime rates in Spain for the period from 2000 to 2006, moving from 2.4 to 3.2 per thousand inhabitants in the case of convicted persons, and from 5.2 to 6.3 per thousand inhabitants in the case of arrested persons.

This is a moderate growth in terms of crime rate. (To put this figures in context we can consider, for example, that the current difference in crime rates between Spain and France or Spain and Germany is 9 and 27 points respectively). But this growth, though moderate, is still significant when compared to the downward trend in crimes rate experienced by other EU countries for the same period of time. As can be seen in Figure 4, Spain is one of the EU countries with the highest growth in its crime rate.

Fig. 4: UE Crime Rate Variations, 2000-2006

Source: Eurostat
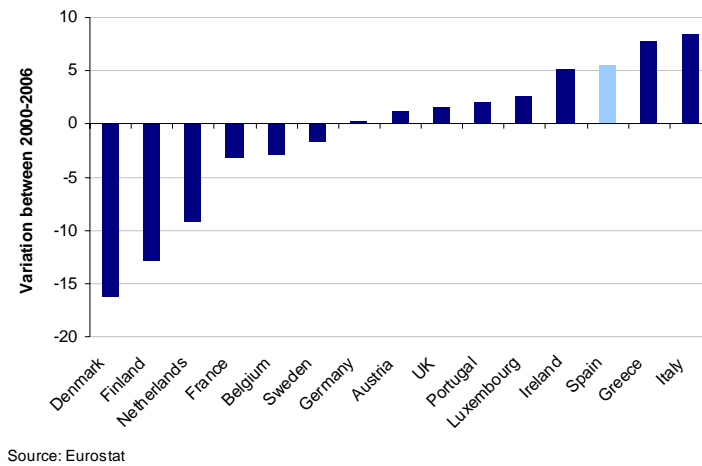
The evolution of the crime rate, as illustrated in Figure 5 below, has not followed a parallel pattern for our two alternative measures based on arrested and convicted persons. The crime rate based on arrested persons has experienced a rapid growth from 2003 onwards. When basing on convictions, the crime rate has also exhibited an increasing trend, punctuated by a slowdown between 2003 and 2005 before resuming its upward trajectory.

Fig. 5: Evolution of Crime Rate in Spain, 2000-2006

Source: MIR, GenCat and INE
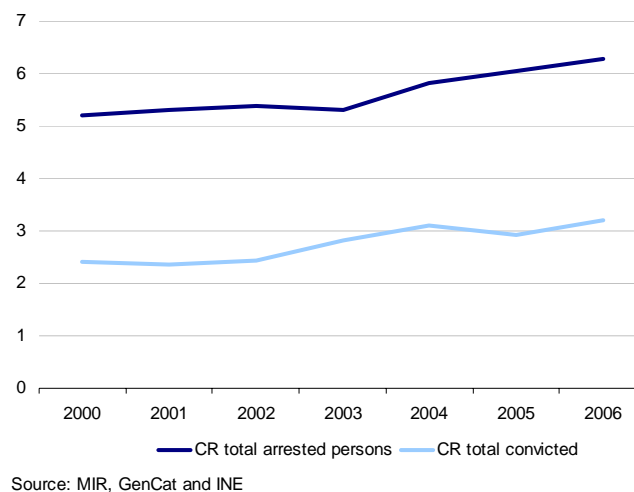
In addition to several irregularities detected in official statistics for the year 2003 (especially when comparing crime rates for nationals and foreigners), this specific

downward trend in the crime rate based on convicted persons is explained by important legislative changes that were introduced in the existing Penal Code that very same year. These changes hardened the prosecution of offences, with the result that certain types of behaviors, previously considered as minor offences or misdemeanors, constituted criminal offences since then. Since 1999, a number of special courts had been created to deal with cases of domestic violence, and stricter sentences associated with this type of offences were applied from 2004 onwards. These facts evolve as a consequence of the widespread perception in the Spanish society of the seriousness of this type of offences. Hence, previously ignored offences related to domestic violence, were treated with increasing severity and prosecuted with the full force of the law since then.

Table 1 shows the evolution of the main offences as well as their respective crime rates for the period under study, measured in terms of convicted individuals. Offences against property, by far the most numerous, did not increase substantially. But offences against persons (homicides and bodily harm) and against their freedom (threats and domestic violence) exhibit a significant increase. Crime rates for each particular offence appear to confirm this upward trend, showing the extent to which crime rates differ for each type of offence.

Table 1: Evolution of Committed Offences and Crime Rates, 2000-2006

	2000	2006	2000-2006	2000	2006	2000	2006	2000	2006
	Commited offences		Growth Rate	Crime Rate		CR Total Población		R Varones 20-50	
Property	785,149	823,864	4.9%	96.0	81.1	19.4	18.4	83.7	76.1
Persons	19,143	77,723	306.0%	12.0	53.7	0.0	0.0 #	0.0	0.0
Homicide and Murder	1,192	1,467	23.1%	1.0	1.3	0.0	0.0 #	0.0	0.0
Battery	17,286	75,671	337.8%	11.0	52.4	0.0	0.0 #	0.0	0.0
Others	665	585	-12.0%	0.0	0.0	0.0	0.0	0.1	0.1
Sexual freedom	7,276	9,951	36.8%	2.5	3.0	0.2	0.2	0.8	0.9
Freedom of the individual	20,038	36,438	81.8%	1.9	13.5	0.5	0.8	2.1	3.4
Domestic relations	7,076	5,426	-23.3%	4.9	6.9	0.2	0.1	0.8	0.5
Collective Security	46,132	35,965	-22.0%	83.4	95.1	1.1	0.8	4.9	3.3
Public Order	18,039	26,876	49.0%	8.1	14.3	0.4	0.6	1.9	2.5
Administration of Justice	5,033	22,001	337.1%	0.5	0.2	0.1	0.5	0.5	2.0
Falsifications	9,937	14,115	42.0%	6.6	5.4	0.2	0.3	1.1	1.3
Others	5,447	7,176	31.7%	20.7	28.7	0.1	0.2	0.6	0.7
Total Offences	923,270	1,068,568	15.7%	243.2	319.3	22.8	23.9	98.5	98.6

Source: MIR, GenCat and INE. Note: Conviction Rare computed as the ratio of convicted persons to total poplation (per 1000 inhabitants).

2.2. Offences committed by foreigners

The apparent correlation between the arrival of immigrants and the growth of crime rates poses an interesting question about the relationship between both variables. A proper answer requires analyzing, first of all, the actual crime rates for nationals and immigrants provided by the two main available sources, namely, the statistics of arrested and convicted persons.

2.2.1 Age and gender

If we want to compare nationals and immigrants, we have to take into account two important aspects which set both groups apart: their gender and age composition.

Age has a direct relation with the commitment of offences. Most penal infractions are concentrated at younger ages. This is a particularly relevant in the case of Spain, an ageing population which has received a massive influx of relatively young immigrants due to the predominantly economic nature of their arrival. The distribution of offences by age for both nationals and immigrants is shown on Table 2 and Figure 6. Almost 70 percent of the offences by nationals and 80 percent of the offences by immigrants were committed by persons aged between 20 and 50 years. For this reason, we will use this age group to make a fair comparison between nationals and immigrants.

Table 2: Distribution of offences by age, 2006

	Between 16-40	Between 20-50
Nationals	72.0%	73.0%
Immigrants	84.6%	81.6%
Total	76.3%	76.0%

Source: MIR

Fig. 6: Age Histogram (total arrested persons, including minor crimes), 2002 y 2006.

2002

Soruce: MIR — Nationals ■ Immigrants

2006

Source: MIR — Nationals ■ Immigrants
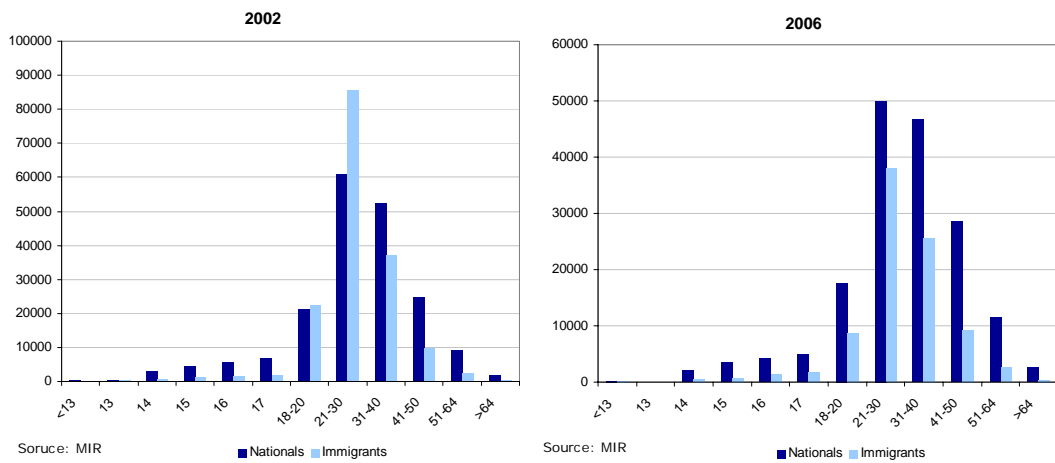
The different age distribution between nationals and immigrants has important implications for the existing differences in the crime rates of both groups. For the age-group with a higher propensity to commit an offence, namely, the male population between 20 and 50 years old, the differences are substantially higher because we only consider nationals in that particular age bracket. In Figure 7, we show the differences for the number of arrested persons, revealing the extent to which the immigrants who have arrived to Spain at a later date show a lesser propensity to commit offences.

Fig. 7: Convergence of Arrest Persons' CR by Nationality, 2002- 2006

— (CR nat. total) - (CR inm. total)   — (CR nat. m 20-50) - (CR inm. m 20-50)

Source: MIR and INE
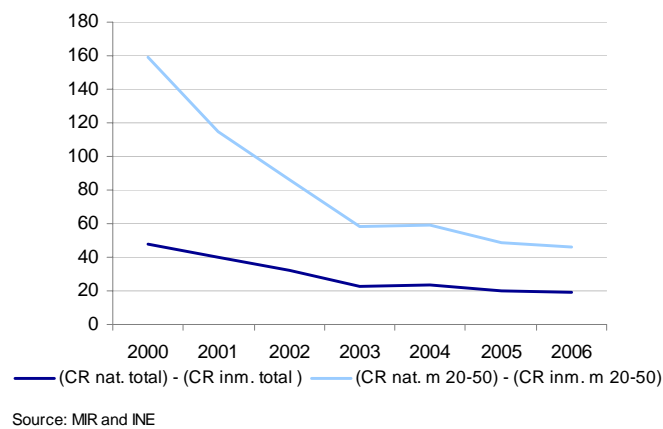
In a similar way, gender affects the propensity to criminal activity, with males committing a disproportionate share of offences. Figures 8 and 9 show the distribution by gender and nationality of the offences committed in 2006. As it can be observed, for the majority of nationalities, including Spanish, 90 percent of offences were committed by males. Particularly significant is the case of immigrants from African countries, among who the rate is close to 100 percent, as immigrants coming from this continent are predominantly male.

Fig. 8: Distribution by Gender (percentage) and Nationality of Detained Persons and Foreign Population in Spain (respectively), 2006

Source: INE
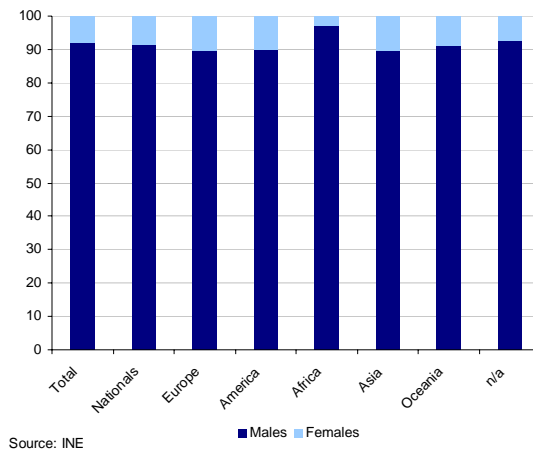
Fig. 9: Distribution by Gender and Selected Nationalities of Foreign Population in Spain, 2006

Source: INE
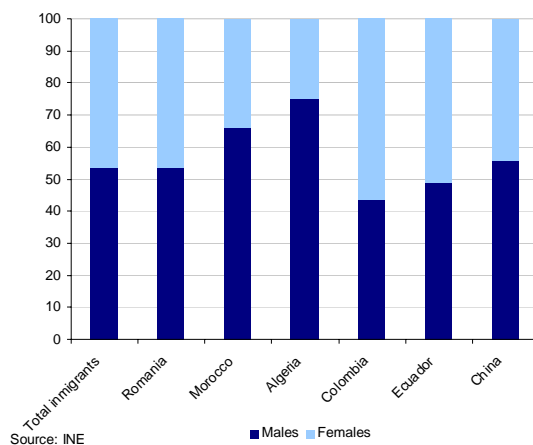
If we focus now on the different types of offences, the same gender pattern is repeated with only minor modifications (see Figure 10). Homicide and bodily harm offences are mainly committed by men: this figure reaches 100 percent in the case of Asian immigrants, being about 80 percent in the case of Latin-American immigrants. Only for offences related with fraud and theft, we find a greater representation of females. In comparison with their Spanish counterparts, Central European and Latin-American women exhibit higher rates, while African women show lowest. The greater weight of female immigrants in some types of offences is clearly evident in the case of offences against the family, with differences close to 30 points between Latin American and Centre European women and their Spanish counterparts.

When studying the offences committed by immigrants, gender is consequently an important factor. Although immigrants living in Spain appear to be evenly distributed in terms of gender, this is not the case when we disaggregate by regions of origin and nationalities. For some countries of origin like, for example, Morocco, there is a clearly greater presence of male immigrants, while for other Latin American countries the situation is just the opposite, like in the case of Dominican Republic. To attain certain degree of homogeneity in our comparison, as we have already done in the case of age, we are going to focus our analysis primarily on males.

Fig. 10: Types of Offence by Gender and Nationality, 2006

13

PROPERTY

FALSIFICATIONS

Source: INE

■ Male ■ Females

Source: INE

■ Male ■ Females
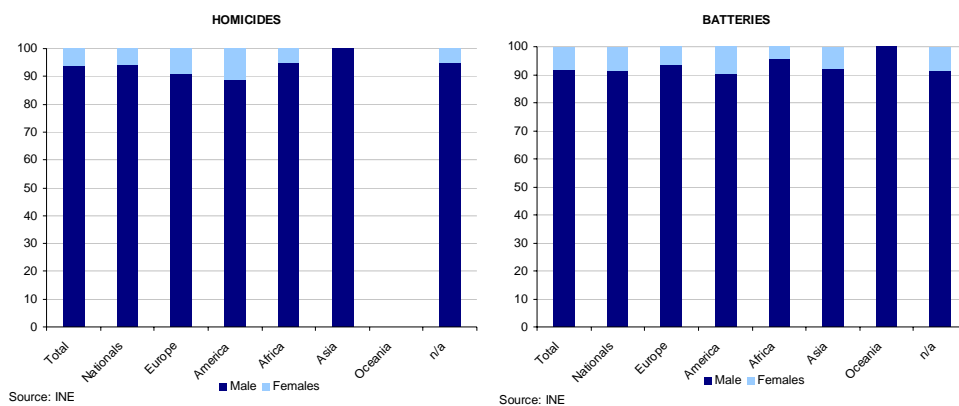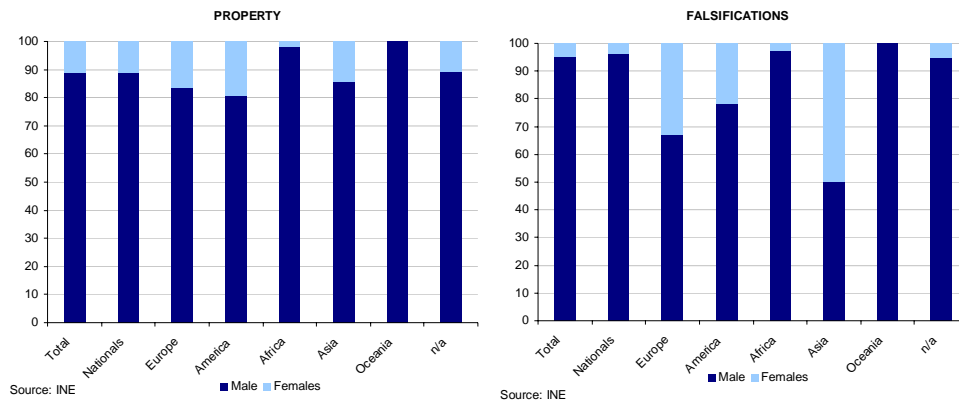
2.2.2. Crime rates for nationals and immigrants.

Figures 11 and 12 show the crime rates for arrested and convicted persons, both nationals and immigrants, as well as the existing gap between them. The first thing that is worth to mention is that the crime rate differential between nationals and immigrants has significantly decreased over time. Currently, the difference is just 46 points in the case of arrested persons and 15 points in the case of convicted persons. The latter differential, for example, is similar to differential in crime rates between the Spanish provinces of Valladolid (4.9) and Cádiz (22.2).

The discrepancies between the data based on arrested and convicted persons are also remarkable. On the one hand, the rates of arrested offenders increased for nationals but decreased for foreigners. On the other hand, conviction rates have been largely stationary, but followed a U shaped pattern for foreigners. These facts will be analyzed in detail later on.

Fig. 11 and 12: Crime Rates for Arrested and Convicted Persons (respectively), 2006

Source: MIR and INE

Source: MIR and INE
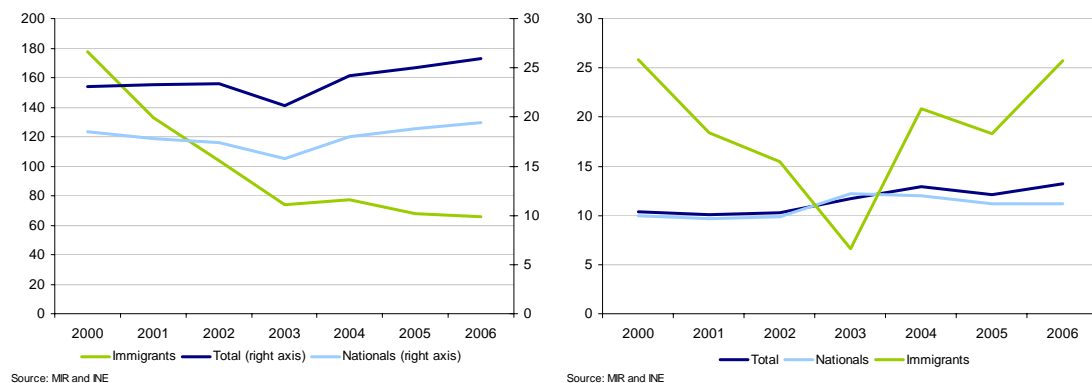
Figures 13 and 14 show the evolution of immigrants' rates of crimes against persons and property, respectively, based on convictions and arrests. Both figures shed further information why there are different trends in the available series of arrested and convicted foreign persons, emphasizing at the same time the greater propensity among foreigners to commit offences against property. In Figure 13 (left-hand side), we can observe that the trend in offences against persons is quite similar for arrested and convicted persons. In Figure 14, by contrast, the trend resembles that observed in Table 1 (offences against property), meaning that those offences contribute mostly to the total crime rate. Despite an increase in the number of offences, as it can be clearly observed in the number of convicted individuals, the number of arrested persons has fallen due to the existing difficulties in resolving this type of offences[3].

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[3] The Spanish Home Office Yearbook reported estimates show that the percentage of resolution for property offences does not reach a 20 percent, while for the rest of offences is well above an 80 percent.

Fig. 13 and 14: Crime Rates (per 1000 inhabitants) for Offences against Persons (left) and Property (right) 2000-2006

Source: MIR and INE

Source: MIR and INE
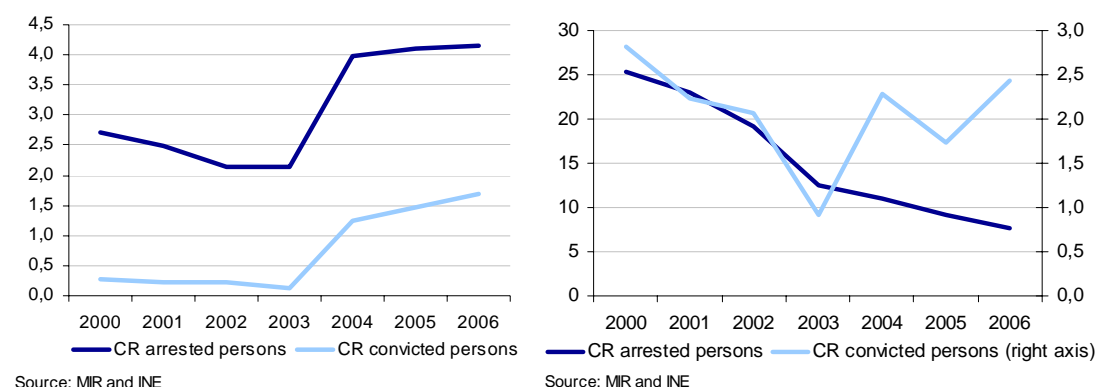
If we look in more detail to the types of committed offences, the crime rates for nationals remain relatively stable, with the major exception of offences against persons which triple their number and for offences against property which experience a slight decrease. In the case of immigrants, the crime rates decrease for all type of offences except for offences against persons, which experience a slight increase.

Table 3: CR for Main Types of Offences, Nationals and Immigrants, 2000-2006

	2000			2006		
	Total	Nationals	Immigrants	Total	Nationals	Immigrants
Persons	1.3	1.1	9.3	4.8	3.7	11.4
Property	11.3	9.0	87.2	8.8	6.8	21.3
Sexual Freedom	0.4	0.3	3.2	0.5	0.3	1.4
Falsifications	0.7	0.3	16.2	0.7	0.2	4.0
Others	8.8	7.4	53.5	8.3	6.9	17.3
TOTAL	22.5	18.2	169.4	23.2	18.0	55.4

Source: MIR. Note: Rates per 1000 males aged20-50.

Nationals and immigrants have both contributed to the increase in the number of offences. To understand better the contribution of both groups, we include a shift-share decomposition of the crime rate for the period 2000-2006. The shift-share decomposition disaggregates the variation in the crime rate in three components. First, the composition effect, namely, the share of the variation in the crime rate due to population changes; Second, the effect which measures the variation of criminality of

both collectives, i.e., the fact that the overall crime rate growth can be attributed to an the increase of the crime rate for nationals and / or immigrants. Last, the residual term of interaction between both changes.[4].

In this particular case, we decompose the growth of the crime rate for 2000-2006 into three elements. The first element will be the composition effect, which indicates the extent to which the increase of each population group (Columns 1N and 1I for nationals and immigrants, respectively) over the total population affects the increase in the crime rates. This element should be interpreted as the contribution of the growth in each population group assuming that the crime rate for each group remains unaltered. The second element (Columns 2N and 2I in Table 5 for nationals and immigrants respectively) measures the contribution of the increase in the crime rate of the population group to the increase in the overall crime rate. This element should be interpreted assuming that the size of population groups has remained constant since 2000.

$$TD_t - TD_{t-1} = \sum_{i=1}^{11} \left[TD_{Nit-1}(\alpha_{Nt} - \alpha_{Nt-1}) + TD_{Iit-1}(\alpha_{It} - \alpha_{It-1}) \right] +$$

$$\sum_{i=1}^{11} \left[\alpha_{Nt-1}(TD_{Nit} - TD_{Nit-1}) + \alpha_{It-1}(TD_{Iit} - TD_{Iit-1}) \right]$$

$$\sum_{i=1}^{11} \left[(TD_{Nit} - TD_{Nit-1})(\alpha_{Nt} - \alpha_{Nt-1}) + (TD_{Iit} - TD_{Iit-1})(\alpha_{It} - \alpha_{It-1}) \right]$$

Where the crime rate is equal to:

$$TD_t = \frac{D_t}{P_t} = \sum_{i=1}^{11} \frac{D_{it}}{P_t} = \sum_{i=1}^{11} \left[\frac{D_{Nit}}{P_{Nt}} \frac{P_{Nt}}{P_t} + \frac{D_{Iit}}{P_{Iit}} \frac{P_{It}}{P_t} \right] = \sum_{i=1}^{11} \left[TD_{Nit} \alpha_{Nt} + TD_{Iit} \alpha_{It} \right]$$

And where TD = Crime Rate per inhabitant, D = number of offences, P = population (millions), α_{It} = proportion of immigrants in the total population, α_{Nt} = proportion of natives in total population, $\alpha_{It} + \alpha_{Nt} = 1$, TD_{Iit} = Crime Rate for immigrants, TD_{Nit} = Crime Rate for natives and the sub-indexes are N = natives; I = immigrants; i = type of offence (i= 1, …, 11).

If immigrants commit offences with the same frequency as nationals, the first term of our equation will be small, meaning that their own characteristics did not result in an increase in the number of offences. On the other hand, if this term is substantial in relation to the other component, it will indicate that the increase in the number of offences is not due to a uniform increase among both nationals and immigrants in their propensity to commit more offences, but to the greater presence of foreigners.

Table 4: CR Evolution. Shift-Share Decomposition (%), 2000-2006

	1N	1I	2N	2I	3N	3I	TOTAL
Homicide	-0.2	0.7	0.2	-0.1	0.0	-0.3	0.3
Battery	-1.9	3.2	47.6	4.1	-5.4	15.7	63.2
Freedom	-0.3	0.3	9.2	0.4	-1.0	1.5	10.1
Moral integrity	0.0	0.0	6.8	0.3	-0.8	1.3	7.6
Sexual Freedom	-0.4	0.8	-0.1	0.0	0.0	0.2	0.6
Non-assistance to a person in danger	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Domestic relations	-0.9	0.8	3.1	0.0	-0.4	0.1	2.8
Property	-16.5	39.9	-42.9	-3.2	4.9	-12.2	-30.0
Against the Treasury Department	-0.1	0.1	0.1	0.0	0.0	0.0	0.1
Collective Security	-14.1	40.6	-5.2	-2.0	0.6	-7.8	12.0
Falsifications	-1.1	4.7	-3.6	-0.6	0.4	-2.2	-2.3
Against the Public Administration	-0.1	0.3	-0.4	-0.1	0.0	-0.3	-0.5
Against the Administration of Justice	-1.2	1.0	14.4	0.8	-1.6	2.9	16.2
Poblic order	-1.4	4.5	5.6	0.2	-0.6	0.7	8.9
Others	-3.5	9.9	5.0	0.0	-0.6	-0.1	10.7
Total	-41.5	106.9	39.8	-0.1	-4.5	-0.6	100.0

Source: elaborated using INE data

If we first look at the total figures in the last row, we observe that the composition effect is behind 65% (106.9 – 41.5) of the growth in the number of offences., In other words, the increase of the immigrant population, who exhibit higher conviction rates, explains two thirds of the crime increase. The other relevant fact which contributes to the total growth in the number of offences is the increase in the crime rate for nationals (Column 2N), Whereas the crime rate for immigrants has remained stable.

There are other significant facts that arise when we examine the different types of offences. When we take into account the crime rate among nationals, a substantial reduction (-16.5 percent) would be expected in the number of offences against property. The arrival of immigrants appears to have offset such effect (39.9 percent), since their contribution to the increase in the number of offences is concentrated in these offences, along with offences against Collective Security (drugs and trafficking).

It is also worth mentioning bodily harm offences and, in general, offences against individuals, freedom and moral integrity. We have already noted that their prosecution has intensified through the provision of better resources and the implementation of more severe court sentences. Since we can control the results with the shift-share decomposition in relation to the population growth experienced by both groups, we can clearly observe that the growth of this type of offences has become particularly relevant in the case of nationals but not of immigrants. In other words, although these types of offences have increased more among immigrants than among nationals, when we compare the population growth of both groups, we can perceive that this increase has been more significant among nationals. This is probably the result of a greater prosecution of this type of offences rather than of being committed more frequently.

Finally, offences against the administration of justice (mainly, breach of conviction) are predominantly committed by nationals, and contribute substantially to the growth of offences during this period.

2.2.3 Offences and nationalities

Nationality is also a relevant factor when considering the evolution of offences in Spain. In Table 5 we implement a decomposition as in the previous chart, but in terms of nationalities (note that the third component of interaction is not shown on this chart due to lack of space, the full chart can be found in the Appendix). Within the overall contribution of the immigrant population to crime growth, this table allows to examine the specific contribution of each nationality and to elucidate if the most relevant factor for each case is the population growth of that particular nationality or the actual increase of its crime rate.

Table 5: CR Evolution by Nationalities. Shift-Share Decomposition (%), 2000-2006

	1EU	1AM	1AF	1AS	2EU	2AM	2AF	2AS	TOTAL
Person	0.1	-1.1	1.1	0.0	-0.3	-1.1	0.6	0.4	-1.3
Property	1.4	-8.1	10.7	0.2	17.9	9.1	25.7	3.3	58.1
Sexual Freedom	0.0	-0.5	0.4	0.0	0.3	0.4	0.8	0.1	1.5
Drugs	0.1	-2.2	2.8	0.0	1.9	2.2	6.9	0.4	11.6
Falsifications	0.2	-2.9	1.8	0.1	1.7	3.3	4.3	1.1	10.5
Others	0.5	-3.0	4.5	0.0	5.3	2.6	9.9	1.0	19.5
TOTAL offences	2.3	-17.8	21.1	0.3	26.9	16.4	48.2	6.2	100.0

Source: elaborated using MIR data

Almost 70 percent (21.1 in column 1AF plus 48.2 in column 2AF) of the growth in immigrants' crime rate can be attributed to foreigners coming from the African continent; a 30 percent to Europeans (columns 1EU and 2EU), a 6.5 percent to Asians; a slight negative contribution of the 1.3 percent for foreigners coming from the American continent (1AM and 2AM). If we distinguish by type of offence, Africans contribute to the increase in all of them. Europeans also made a relative contribution to the increase of offences against property, and to a lesser extent Latin-American and Asian immigrants.

It is worth noting that in the case of African immigrants their contribution to the increase in the number of offences is due to an increase in criminality rather than to a population growth. This result points out the lack of integration currently experienced by this collective. This new pattern, namely, the increase in the number of offences attributed to higher criminality rather than population growth, can be found in the case of almost all nationalities, but with a lesser intensity than in the case of African immigrants.

Statistics about arrested persons provide further details for all different nationalities, providing an overall picture of the crime situation in the last few years. In particular, the disaggregation by nationalities reveals relevant factors which are not apparent with a disaggregation by continents of origin. There are obvious differences between countries within the same continent, like Europe or America.

To select the most relevant countries of origin for our analysis, we exploit the data provided by the municipal census (*Padrón Municipal*) of the National Institute of Statistics (INE). Figure 15 shows the male population between 20 and 50 years of age (the age group more prone to commit offences) of the major nationalities. As it can be observed, in contrast with the case of Morocco, the number of Colombian immigrants has increased at a slower rate, while the number of Ecuadorian immigrants has experienced a decrease in the last year.

Fig. 15: Evolution of Male Immigrants (20-50 age), 2000-2006

Source: INE
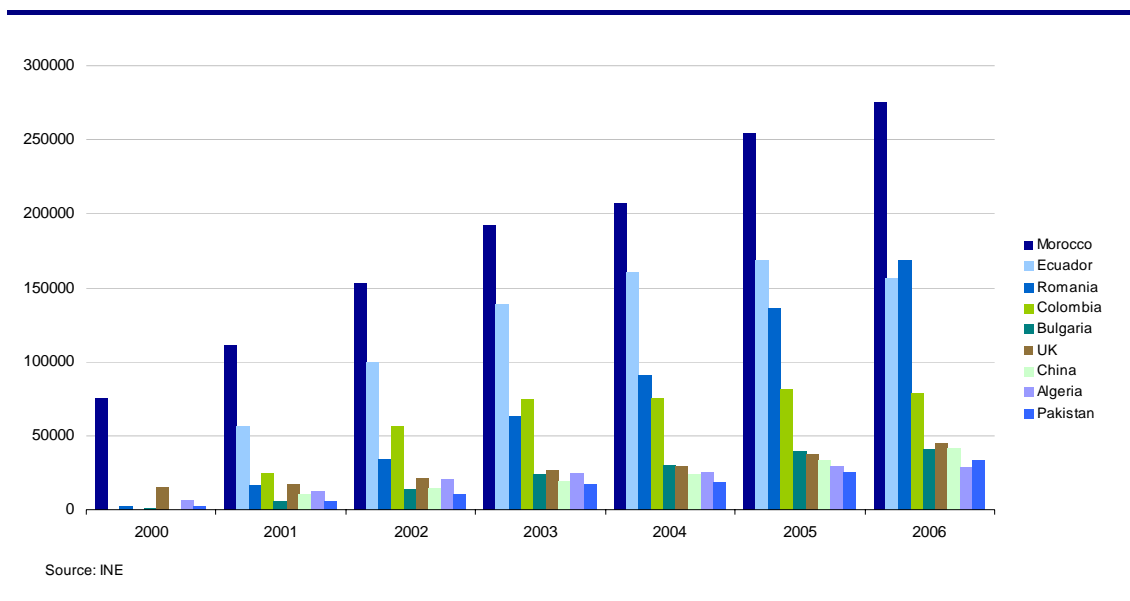
If we observe the crime rates for the different nationalities (according to the number of arrested individuals) there appear three important aspects. First, the crime rates for nationals, as we have already mentioned, is lower than for the rest of nationalities in all types of offences

		Romania	UK	Colombia	Ecuador	Peru	Algeria	Morocco	China	TOTAL immg	SPAIN
PERSONS	Homicide	0.4	0.8	0.8	0.3	0.2	1.1	0.6	0.4	0.5	
	Battery	3.5	5.8	3.0	2.8	1.9	5.6	4.6	1.5	3.3	
	Others	5.4	8.5	6.3	9.5	7.2	4.2	4.1	1.8	5.7	
	Total	9.2	15.2	10.2	12.6	9.3	10.9	9.3	3.6	9.5	3.0
PROPERTY	Aggravated robbery	5.8	1.7	4.6	3.2	2.6	29.0	11.9	0.5	6.1	
	Burglary	24.2	5.6	5.0	1.5	2.0	57.7	12.0	0.6	10.0	
	Theft	21.8	2.8	3.3	2.6	5.8	33.1	3.3	0.8	6.5	
	Fraud	3.6	2.6	1.2	0.5	1.6	2.3	0.6	1.3	2.0	
	Others	11.3	10.8	4.0	3.1	3.3	26.6	11.3	30.8	11.0	
	Total	66.6	23.5	18.1	10.9	15.4	148.6	39.0	33.9	35.6	7.9
SEXUAL FREEDOM	Total	4.5	1.9	1.4	1.6	1.4	2.2	2.0	0.4	1.9	0.3
DRUG TRAFFIC	Total	0.9	6.0	11.0	0.7	0.7	12.6	11.7	0.1	6.4	2.4
FALSIFICATIONS	Total	11.8	2.4	4.5	3.0	3.1	8.4	5.1	9.5	6.2	0.2
OTHERS	Total	16.3	22.3	11.7	9.4	11.5	31.2	22.2	8.0	16.2	4.2
TOTAL OFFENCES	Total	109.4	70.9	55.7	40.2	41.4	215.7	89.4	55.6	75.8	18.1

Note: CRIME RATE = (arrested persons / pop 20-50) x 1000
Source: MIR and INE

Secondly, there is a significant heterogeneity in the case of the offences committed by each nationality, which suggest certain "specialisation" of crimes according to countries of origin. Leaving aside the case of individuals from Algeria, a relatively small collective in terms of the overall immigrant population, it appears that Romanian concentrate in offences against property, Moroccan in drug trafficking, and Chinese in falsifications.

Finally, the other significant aspect is that the crime rate (measured as the number of arrested individuals per thousand inhabitants) has evolved differently between different nationalities. The crime rate has fallen for all nationalities since 2001 (see light blue column in Figure 16), but at different rates. The fall has been more significant for Romanian delinquents, slightly lesser for Moroccans, and much lower for Colombians and Chinese.

Source: MIR and GenCat
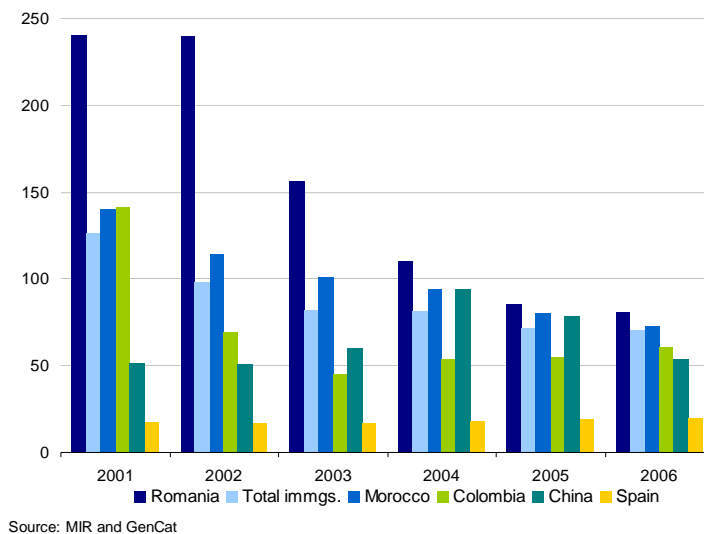
The most interesting question here is whether this fall in the crime rate is due to the fact that the population growth (in this case, of male immigrants aged between 20 and 50 years) is greater than the increase in the number of crimes committed by that specific population group, which, if it is the case, will indicate an "improvement" in the profile of the more recently arrived immigrants. To examine this question, Figures 17 to 20 show the growth rates of the different types of offences and the population from different nationalities in Spain.

In the case of Romania, we can observe that the crime rate for minor theft for Romanian arrested persons has declined rapidly from the 342 per thousand in 2000 to the 12.2 per thousand in 2006. Does this sharp decline result from a population growth (which will increase the rate denominator), or from a reduction in the number of offences (which will decrease the rate nominator)? Data available show than both variables have in fact increased, but the population has grown at a greater rate than the number of committed offences (see Figure 17). Thus, offences have increased (most likely, by the arrival of more immigrants) but at a slower rate than the growth of the Romanian immigrant population, which results in a substantial decrease in the crime rate of this collective.

In the case of Moroccan immigrants, the crime rate for drug trafficking has fallen from 21.5 per thousand in 2000 to 7.8 per thousand in 2006 (see Figure 18) In fact, the overall trend for drug trafficking offences among this immigrant collective appears to have slowed down, having experienced a significant reduction in the last two years. Although there has been also a slowdown in their population growth, this is still higher than the increase in the number of offences, thus resulting in a partial reduction in their crime rate.

For Colombian immigrants, the evolution has been remarkably different. Their crime rate appears to have stabilised in 2006 around the 0.7 per thousand inhabitants, after falling from 2.1 per thousand inhabitants in 2000 (see Figure 19). Until 2004, population growth was higher than the number of homicides and, as a result, crime rates exhibited a relative reduction until then. Since 2004, however, homicides committed by Colombian immigrants have grown more than its population, with a peak in the crime rate that year. In 2006, both population and the number of offences have grown at similar rates and, therefore, the crime rate for Colombian immigrants has remained relatively stable.

Finally, the crime rate among the Chinese immigrant population has experienced substantial variations during the period (See Figure 20), largely due to population growth, although there is a tendency to decrease (from 13.4 per thousand to 9.8 per thousand) in the last few years.

Fig. 17, 18 19 and 20: Growth of Offences and Immigrants by Nationalities, 2001-2006

GROWTH RATE OF BURGLARY/ROBBERY AND ROMANIAN IMMIGRANTS

Aggravated Robbery — Burglary — Theft — Population

Source: MIR and INE

GROWTH RATE OF DRUG TRAFFIC AND MOROCCAN IMMIGRANTS

Drugs Traffic — Population

Source: MIR and INE

GROWTH RATE OF HOMICIDES AND COLOMBIAN IMMIGRANTS

Homicide — Battery — Population

Source: MIR and INE

GROWTH RATE OF FALSIFICATIONS AND CHINESE IMMIGRANTS

Falsifications — Population (right axis)

Source: MIR and INE

2.2.4. Minor offences (misdemeanours) and foreigners

At the beginning of this paper, we mentioned that part of the interest in analysing the relationship between immigration and crime lies in the public perception of both phenomena and their possible correlation. In Spain, a majority of the national population appears to be positively convinced of the existence of a close relationship between both of them. In the creation of such a widespread perception, the role of offences is not as relevant as that of minor offences or misdemeanours. There are few people, for example, who have been direct witness of a homicide. However, if we think of the people who might have been victims of non-violent theft, the number of them increases substantially. The extent to which these minor offences are experienced by the majority of the population will consequently determine to a large extent the public perception of crime, much more than the actual number of offences committed.

In relation to minor offences, the most relevant aspect for the period under study is the growth of these types of offences, significantly higher than the number of criminal offences, while the number of arrested individuals has decreased for the same period (see Figure 21).

Table 7: Evolution of Committed Minor Offences and their CR, 2000-2006

	2000	2001	2002	2003	2004	2005	2006
Property	669843	757373	829684	829706	888540	954994	994657
Person	184067	189338	192527	202252	205055	218208	229337
General Interests	3316	3428	2969	2793	2698	2781	2533
Public Order	9300	10464	12384	13112	12620	10535	10778
Special Legislation	194	162	13				
TOTAL	866720	960765	1037577	1047863	1108913	1186518	1237305
Population*	9377932	9666300	9973648	10264698	10404419	10691791	10833088
CRIME RATE	92.4	99.4	104.0	102.1	106.6	111.0	114.2

Source: MIR, GenCat and INE. Note: population considered are males aged 20-50. Crime Rate computed per 1000 inhabitants

Fig. 21: Persons Arrested for Minor Offences

Source: MIR
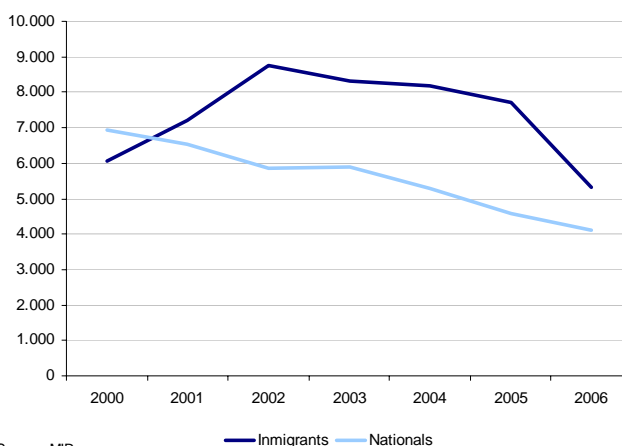
How have foreigners contributed to the growth in the number of minor offences? There is no easy answer to this question, as we do not know who have committed them. The available information about arrested persons, which distinguishes between nationals and foreigners, is far from representative of the actual offenders, given the low rate of arrests for this type of minor offences. When we compare the crime rates for, nationals and immigrants, we can see that the rate for nationals decreases slightly for the period

under study, moving from 7.6 per thousand to 4.4 per thousand, while for foreigners it falls quite significantly from 225.3 per thousand to 35.2 per thousand (See Figure 22 below).

Fig. 22: CR Evolution according Persons Arrested for Minor Offences, 2000-2006

Source: MIR
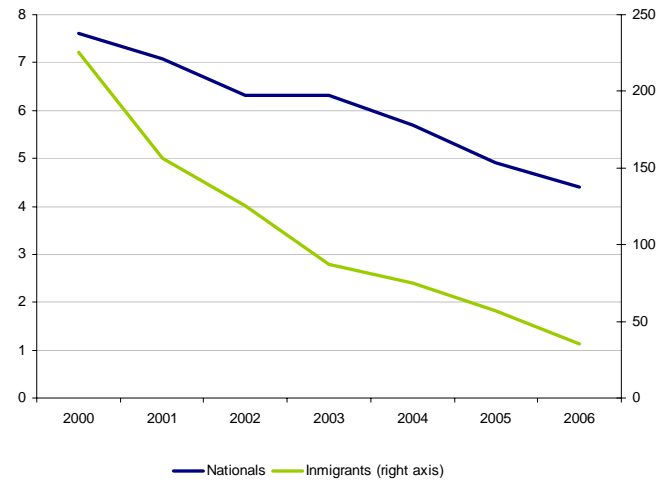
Looking at the immigrants' crime rates along 2000-2006 by country of origin (Figure 23), we observe that Algerian and Romanian show, by far, the highest crime rates.

Fig. 23. CR of Minor Offences by Nationalities, (average) 2000-2006

Source: MIR and INE
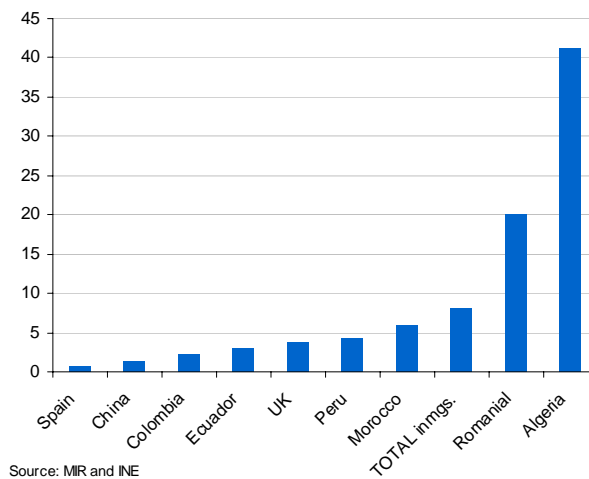
2.2.5. Immigration or Culture

The main economic models of crime behavior attempt to explain the reasons why foreigners may have higher crime rates than nationals. In the last instance, these models provide rationale to situations in which being an immigrant in a foreign country partially reduces the opportunity cost to commit a crime when compared to nationals. However, there is also another possible explanation: the immigrants bring with them a whole set of values, rules, and experiences (i.e. a culture) which do not consider such criminal activities to be totally reprehensible and, as a result, they may have a greater propensity to commit certain types of offences.

We have seen how the differential in crime rates between nationals and immigrants has significantly narrowed in the period under study, although there remains a substantial gap. We have shown the specific types of offences and the nationalities which have mostly contribute to the continuing existence of this crime gap between nationals and immigrants in terms. Some of the points raised in our analysis will be explored in more detail in the next section.

In this section, we are going to provide further evidence to disentangle which one of the two possible alternatives proposed at the beginning of this paper contributes mostly to the crime rate differential between nationals and immigrants.

For such purpose, we proceed as follows. We first concentrate on a particular criminal offence (in this case, homicide) which is similarly defined worldwide in all the legislative codes, and is therefore particularly useful to in Spain for different nationalities (first column in Table 8). We also report the homicide rates committed in the countries of origin, obtained from the United Nations data (Column 2). Finally, we compute the ratio between the homicide rates in the host country (Spain) and in the country origin by nationality (Column 3).

If the resulting ratio is fairly similar for different countries of origin, this would support the idea that something in the fact of being immigrant makes them to maintain similar crime rates between their country of origin and their host country. This would imply that if we take the crime rate for a particular country of origin and multiply it for a

constant (common to immigrants of any origin), we would obtain the crime rate in the host country for the immigrants coming from that particular country.

However, if the ratio differs widely by nationality of origin, it would suggest that the factor behind crime propensity is not the fact of being an immigrant, but rather the whole set of values, rules and experiences, brought by immigrants. In such case, the crime rates are different because each nationality has some indelible traits which are not easily forgotten by the fact of having migrated to a different country.

Our results in Table 8 provide support to both hypotheses. On the one hand, the ratios of homicide rate in the host country to homicide rate in the country of origin suggest the existence of three distinct groups of countries of origin, which, in addition, have its basis on strong cultural differences between the three continents of origin. The existence of clear differences between these three groups is in accordance with the role of cultural differences in explaining higher crime rates among immigrants by origin. On the other hand, there are important similarities within nationalities in each group. These similarities are not observed if we only look at the homicide rates by nationality in the country of origin or in the host country. This result supports the first hypothesis by which immigrants have a crime rate different than nationals by the mere fact of being an immigrant.

Table 8: CR comparison by countries

	CR mean	CR origin	CR mean / CR origin
UK	14,8	1,5	9,6
Romania	26,7	2,4	10,9
Algeria	98,7	1,7	56,9
Morocco	30,8	0,5	64,8
Colombia	29,1	59,3	0,5
Ecuador	13,1	17,0	0,8
Peru	5,5	4,9	1,1
China	14,3		

Source: MIR, INE and UN Office on Drugs and Crime.
Note: CR mean shows the CR ratio for the number homicides per 1000 inhabitants,
CR origin is the CR recorded in each country.

III. EMPIRICAL ANALISYS

Our main information sources for crime are the data on convictions from the Ministerio del Interior (Spanish Ministry of Home Affairs) and the data about committed crimes from Instituto Nacional de Estadística (Spanish National Statistics). Both sources provide province-level annual data between 1999 and 2006.

The data about committed crimes includes no information regarding the nationality of lawbreakers, but data on convictions is broken down between national and non-national convicted criminals. Besides, there is a disaggregation by type of crime, among economic crimes (including property and other economic crimes), and crimes against the persons. However, this information is only available for those criminals already convicted.

In both cases, the crime rates (based on either committed crimes or convicted criminals) where defined as crime rates per each 10,000 inhabitants, for which the corresponding province populations from Census were used. When the crime rates were computed for nationals and non-nationals, the relevant population was the province number of nationals and non-nationals, respectively.

The main descriptive statistics of the province crime rates between 1999 and 2006 are shown in Table 9. We also show the ratio of convicted to arrested, as a measure of deterrence.

Table 9: Descriptive Statistics: Province Crime Rates per thousand inhabitants, 1999-2006.

	Obs	Mean	Std.Dev.	Min	Max
CR: crimes	416	19.80	11.85	0.29	72.22
CR: property crimes	416	16.26	13.39	0.07	171.44
CR: minor offences	416	34.71	19.15	0.03	91.96
CR: total crimes	416	54.51	29.18	0.45	147.87
Conviction rate: total crimes					
Total	416	2.89	2.02	0.51	18.45
Immigrants	416	10.17	17.47	0.43	194.61
Natives	416	2.60	1.46	0.46	14.36
Conviction rate: property crimes					
Total	416	0.88	0.59	0.06	5.66
Immigrants	416	3.08	5.33	0.00	59.43
Natives	416	0.80	0.43	0.06	4.19
Conviction rate: crimes against persons					
Total	416	0.31	0.27	0.03	2.25
Immigrants	416	0.95	1.46	0.00	14.53
Natives	416	0.28	0.22	0.03	1.74
Deterrence: convicted/ arrested	416	7.13	9.14	0.43	99.04

As socioeconomic determinants of the crime rates, we make use of several demographic and socioeconomic variables at the province level. Our main variable is the immigrants' share by province and year, defined as the ratio of foreign population to total population. Other variables include the proportion of urban population, defined as those living in municipalities above 100,000 inhabitants, and the proportion of males aged 20 to 50, both for foreign and nationals.

Besides, we also exploited the Encuesta de Población Activa (Spanish Labor Force Survey) to compute the average time of residence of foreigners and the educational level of nationals and non-nationals (defined as the proportion of people aged 20 to 50 who completed studies above the primary level). In addition, we obtained the unemployment rates for males aged 20 to 50 of nationals and non-nationals. We concentrate on this group because most crimes are committed by males aged 20 to 50, so it is important to control for differences in this group among nationals and migrants. These variables were computed by region, so that we do not have cross-section variability between provinces in the same region.

We have also considered the province GDP per capita (in thousand euros) and the share of services and building industries in province GDP, both obtained from the regional accounts.

Table 10: Descriptive Statistics: Provincial Demographic and Economic Variables, 1999-2006.

	Obs	Mean	Std.Dev.	Min	Max
Immigrants' share	416	4.28	3.9	0.25	20.14
Pop. urban areas (>100,000 inhabitants)	416	27.14	21.65	0	75.99
Share of male aged 20-50: natives (%)	416	22.77	1.32	19.02	26.58
Share of male aged 20-50: immigrants (%)	416	35.93	6.99	15.85	57.27
Year of residence (immigrants) (years	416	4.81	1.61	2.19	12.13
Educated natives aged 20-50 (%)	416	82.02	6.65	68.14	95.05
Educated immigrants aged 20-50 (%)	416	66.8	14.14	9.94	100
Unemployment rate: male natives 20-50 (%)	416	11.66	4.97	4.35	26.56
Unemployment rate: male immigrants 20-50 (%)	415	15.97	6.07	4.64	59.99
GDP per capita (thousand euros)	416	17.1	4.29	9.2	31.54
GDP Serv. & Building Ind./ GDP total (%)	364	73.77	9.03	55.92	94.65

At first sight, if we consider the simple correlation between the crime rate and the immigrants' share at the province level (Figure 24), there is not a clear relation between them. When we consider the rate of crimes committed by foreigners and the immigrants' share, the relation is also weak. Besides, the negative sign contradicts the hypothesis that posits that crime rates are higher the higher the concentration of immigrants, due to network effects. In particular, the provinces with the highest rates of crimes committed by foreigners (Cádiz and Sevilla) are among the ones with low immigrants' shares (2.7 and 2.5 percent, the national average being 9.3 percent). In contrast, the rates of crimes committed by foreigners are below the national average in those provinces with the highest immigrants' share, as Alicante and Almería (with 20.1 and 17.4 percentage of immigrant population and foreigners' crime rates of 2.08 and 1.33 percent, the national average being 2.51 percent.

Figures 24 y 25: Correlation between immigrants' concentration and total crime rate (left) and foreigners' crime rate at the province level, 2006
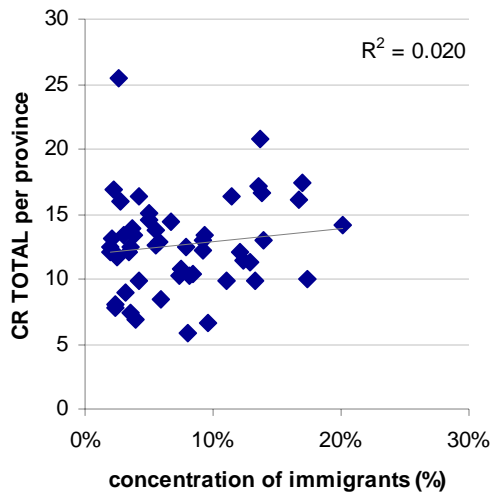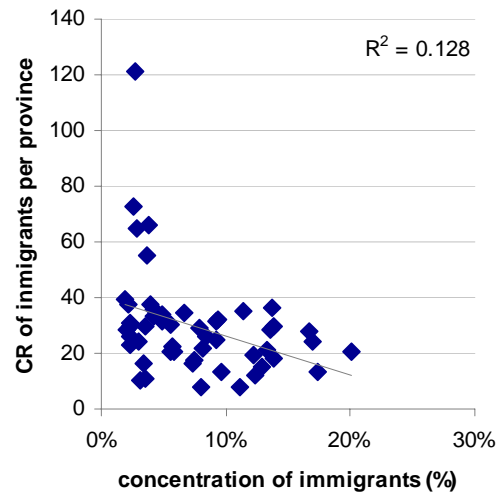
Source: INE.   Source: INE.

In order to provide a more rigorous assessment of the relationship between crime incidence and immigration, we will specify and estimate an econometric model. Given the information available about crime behavior, in particular, the lack of data on crime experience at the individual level, our empirical model is not fully coherent with a model for individual behavior. We focus on province level data to estimate a model based on the hypotheses that lead to the economic model of crime. We should keep in mind the data limitations, which make that we cannot infer implications about individual behavior from our empirical findings.

Our aim is to explore whether there exists a link between the incidence of crime and the increasing percentage of immigrants in the Spanish population. For this purpose, we use longitudinal data of provinces between 1999 and 2006.

Our variable of interest is the province crime rate (measured as the ratio of crimes to province population). Given our concern with the potential incidence of the immigration, we include as explanatory variables the share of foreign residents in total population. Besides, we consider those variables which capture the opportunity cost of crime activities relative to the legal activities, which have been discussed earlier. In addition, in order to control for differences in demographic and socioeconomic conditions between migrants and nationals, we include, for each two groups, the proportion of males aged 20 to 50, the unemployment rate for this age group, and the

percentage of educated people within this age group. Furthermore, in order to control for differential effects by immigrant country of origin, we have considered the weight of immigrants from four regions of origin: non-UE Europe, Latin America, Africa, and Asia.

Several contributions (Sah, 1991; Glaeser et al., 1996; Fajnzylber et al., 2002; Grogger, 1995) have pointed out the potential importance of criminal experience, learning-by-doing in criminal activities, as well as the scarcity of opportunities in legal activities for ex-convicts. The importance of these effects can be tested introducing the lagged crime rate among the covariates, in line with Buonanno and Montolio (2007).

Our empirical specification, using sub indices i and t to denote provinces and years, respectively, can thus be written as

$$C_{i,t} = \rho C_{i,t-1} + \beta' X_{i,t} + \eta_i + \alpha_t + u_{i,t}$$

where C denotes the crime rate, and X is the vector of further covariates affecting crime rate; the last three terms denote unobserved terms capturing unobserved heterogeneity among provinces, aggregate shocks common to all provinces, and idiosyncratic shocks.

In this context, the existence of province-level unobserved heterogeneity introduces a potential endogeneity problem to the extent that province-level omitted factors can be correlated with the observed covariates. This is the case, by construction, whenever the lagged crime rate is included. Under the assumption that province-specific unobserved factors are invariant over time, the availability of longitudinal or panel data may yield consistent estimates by means of a fixed-effects transformation that removes the unobserved heterogeneity term, whereas the parameters of interest remain unchanged after such transformation. The fact that there are endogenous variables among the covariates (the lagged dependent variable, among others), requires an instrumental variable procedure.

The obvious instruments are the lagged values of the covariates, which are uncorrelated with the error term. Nevertheless, we also consider the share of services and building industries in province GDP as instrument for the share of resident immigrants in province population. This variable is positively correlated with the share of immigrants in each province total population (see left graph in Figure A.1), due to the high labor

participation of immigrants in these activities. Nevertheless, the full exogeneity of this variable could be questioned, to the extent that as this variable increases, the labor opportunities of immigrants increase, and migrants might become less prone to involve in criminal activities. In such case, the use of this instrument could induce a negative bias when estimating the relation between immigrants' share and crime rate. However, this argument, which seems appropriate in static terms, is weakened in dynamic terms. In the right graph of Figure A.1, we find that the regional unemployment rate for immigrants, if anything, is positively correlated with the share of services and building industries in regional GDP. In fact, we find that the immigrants' unemployment rate moves in the same direction as the weight of services and building in regional GDP, which challenges the previous reasoning. The high geographical mobility of immigrants is behind this result, thus inducing the positive correlation between the geographical concentration of immigrants and the importance of those activities that offer them more employment opportunities. Nevertheless, we have implemented estimations with and without this instrument, and our results are robust to the inclusion of this variable in the instrument set.

The estimation approach consists on a generalized method of moments (GMM) estimator (see Hansen, 1982; Arellano and Bond 1991). In particular, our estimation approach consists of a system-GMM estimator proposed by Arellano and Bover (1995) and developed by Blundell and Bond (1998). Given the small sample size, the standard errors must be appropriately corrected from potential finite-sample bias following Windmeijer (2004).

We will consider three different measures of the dependent variable: total crimes, property crimes and minor crimes. The OLS estimates are inconsistent in the presence of province unobserved effects correlated with the covariates. In particular, if there are unobserved province characteristics that are related with the share of immigrants in the province, we would obtain an inconsistent estimate of the effect of immigration on crime. The within-province transformation would remove any time-invariant province effect, but it requires strict exogeneity of the right-hand-side variables, what it is not the case if the lagged crime rate is among the explanatory variables.

In Table A1, we report OLS estimates (excluding the lagged crime rate) and the within-province estimates. The most remarkable fact is that OLS estimates produce a positive

and significant coefficient of the concentration of immigrants on crime rates. This would lead to conclude that immigration has a positive effect on the local crime rate, even after controlling for province specific characteristics, such as economic conditions and the population composition. The significance of the immigrants' share disappears when we implement the within-province estimation, except for minor crimes. However, these estimates are not reliable too, since it is well-known the inconsistency of this estimator in the presence of the lagged dependent variable.

The GMM estimates are reported in Table A2. In the first two columns, we have only included the immigrants' share and the lagged crime rate, so that other province observed characteristics, such as economic conditions and population composition, were excluded. In the first two specifications, the immigrants' share exhibits a positive and significant effect for total crime, and also for property and minor crimes. The estimates in the last two columns include province-level variables that capture demographic and socioeconomic conditions for nationals and non-nationals. Interestingly, the lagged crime rate loses its significance when these additional control variables were included. Most variables were no significant at the 10 percent level, but jointly they add explanatory power to the specification. Both for total crimes and for the two types of crimes considered, the immigrants' share is positive and significant even after controlling for all the observed socioeconomic and demographic factors. In comparison with OLS estimates, though, the estimated effects are, in general, substantially smaller.

In the case of total crimes, we find that the share of males aged 20 to 50 is negative for immigrants, but not significant, and positive for nationals. Besides, the coefficient of this variable for nationals is sizeable. We can interpret it as follows: a one percent increase in the proportion of national males between 20 and 50 years would lead an increase of 3.9 additional crimes per thousand inhabitants. In relative terms, given that the sample mean of the total crime rate was about 600 in 2006, a one percent increase in national males aged 20 to 50 would lead to an average increase in total crime around 6.5 percent. In 2006, the ratio of males aged 20 to 50 to total males was 69 percent for immigrants and 46 percent for nationals. In the case of nationals, this figure is fairly constant in the sample period, whereas the proportion of this age group among immigrants was at its maximum in 2005 and 2006. The non significance of the share of this age group for male immigrants is easily explained by the fact that the immigrants'

share is highly correlated with the share of this age group, even after controlling for province effects (80%). Behind our result, there remains the fact that the age distribution of immigrants is very different from the age distribution of nationals. In particular, distribution of immigrants is strongly biased towards the group with the highest crime incidence, males aged 20 to 50, so that the immigrants' share captures all the effect of any increase in this group.

Looking at the effect of the immigrants' share, the estimated effect implies that a one percent increase in the concentration of immigrants would lead to an average increase of 1.9 further crimes per each thousand inhabitants, which approximately amounts to a 3.2 percent increase in the total crime rate. Nevertheless, given the relative size of immigrants and nationals, the absolute effect on the total crime rate is still larger for immigrants: male immigrants aged 20 to 50 represented, in 2006, one sixth of male nationals aged 20 to 50.

The specification tests, namely the Hansen-Sargan and the AR(2) tests, yield mixed evidence. Whereas the high p-value of the AR(2) test does not indicate specification error, the Hansen-Sargan test has a p-value of 2 percent, which sheds some doubts on the specification. It may be pointing out that some of the instruments used are invalid. But this test is a general specification test. For instance, it could be indicating misspecification of the functional form. In particular, we are aggregating different types of crime when computing the total crime rate, and assuming that the effects of all the variables are proportional to the number of any type of crime. We can investigate whether this latter explanation has empirical support, concentrating on separate estimates by type of crime.

Concerning crime types, we first find that the specification tests are much more favorable when we use disaggregated categories of crime. This finding reflects the fact that socioeconomic and demographic variables have different effects on different types of crime.

Both for property and minor crimes, we find again that immigrants' share and the share of male nationals aged 20 to 50 have a significant effect. In the case of immigrant share, we find that a one percent increase of this variable would lead to average increases of 4.6 percent in the rate of crimes against property, and 3 percent in the rate of minor crimes.

Notice that behind the apparently higher effect of immigration on minor crimes, there is the fact that the incidence of minor crimes is the highest. Moreover, it is worth noticing that minor crimes include misdemeanors, entailing mostly economic or administrative sanctions but not penal and imprisonment measures. In this latter case, the relative lack of knowledge of immigrants might be behind their higher propensity to commit minor crimes.

The significant coefficients of the share of national males aged 20 to 50 imply, on average, that a one percent increase in the size of this group would increase property crimes by 15 percent, and minor crimes by 7.4 percent. Again, the relative effects of this national population group are higher than the effect of immigrant population, but if we account for the relative sizes of both populations, the absolute effect is higher for immigrants. In any case, the positive effect of immigration on crime, although significant, must be qualified. The contribution of immigration to the crime phenomenon is strongly related with the fact that an increase in immigrants lead to an increase in total population of the male group more prone to commit crime.

Our results are fairly coherent with the predictions of the economic model of crime, so that once that we control for socioeconomic and demographic factors, some of which capturing differences among nationals and immigrants that potentially affect the propensity towards crime, the effect of the immigrants' share is reduced. In particular, our results show that the fact that immigration tend to increase the weight of males aged 20 to 50 in Spanish population, which is the group more prone to commit crime, is behind the significant effect of the immigrants' share. Regarding this, we find that an increase in the proportion of this population group within national population would also have a significantly positive effect on crime.

In the previous estimates, we have provided evidence about the province crime rate and the weight of immigrants in province population. We now investigate an alternative model, which considers the crime rate differential between immigrants and nationals, and see how immigrants' share affect this differential, once after controlling for socioeconomic factors. We thus consider the following equation,

$$(C^I - C^N)_{i,t} = \rho (C^I - C^N)_{i,t-1} + \beta' X_{i,t} + \eta_i + \alpha_t + u_{i,t}$$

The only information related with province crime rate which is available separately for nationals and non-nationals is provided by the number of convictions. Thus, we have measured the difference in the crime rate between immigrants and nationals using this variable, which also provides disaggregation for total crimes, economic crimes, and crimes against persons.

In addition to immigrants' share in the province, we consider among the covariates those factors capturing the heterogeneity among national and immigrant population which might be relevant within the economic approach to crime activities. These variables are the differences between immigrants and nationals in the unemployment rate, the average level of education, and the weight of males aged 20 to 50 in total population. We have also included the average duration of residence of non-UE foreigners. Moreover, in order to control for differential effects by immigrant country of origin, we have considered the weight of immigrants from four regions of origin: non-UE Europe, America, Africa, and others. Besides, the equation above was estimated with and without the weight of services and building in province GDP among the instrument set.

In all the specifications for the differential in the rates of total crimes, the immigrants' share exhibits a negative coefficient, generally significant, what points out that the crime rate differential would narrow as the immigrants' concentration increases. Besides, the education gap between non-nationals and nationals has a negative effect on the crime differential, which is significant at the 10 percent. Hence, the crime differential becomes lower the lower the education gap.

We now discuss the results disaggregated by type of crime. In the case of economic crime, we find again that the differential in property crime rates is narrowed as the immigrants' share increases. From estimates in the second and fourth columns, we find evidence of a negative composition effect in immigrants' population. In particular, the fourth column estimates indicate that a higher proportions of American, non-UE European, and African immigrants tend to widen the crime differential, the estimated effect being larger for the latter ones. This result would suggest that cultural differences in attitudes towards economic crime.

Interestingly, the unemployment rate difference exhibits a positive and significant effect, thus reflecting the fact that the crime rate differential increases when the

differences in employment opportunities are widened. Last, differences in the proportion of males aged 20 to 50 have a significant effect, but negative, what is contrary to expected.

With regard to crimes against persons, the model has much lower explanatory power. However, this result is not surprising, since this type of crime is expected to be relatively unaffected by socioeconomic reasons. The strongest result here is that the crime rate differential increases with the immigrants' time of residence. Also, the proportion of African immigrants and the differential in the proportion of males aged 20 to 50 has a positive effect on the crime differential.

IV. CONCLUSIONS

Crime rates in Spain are not (by European standards) but have steadily increased in the last couple of years. The rates of crimes committed by immigrants are substantially higher than nationals. Although those differences are still true today, they have been substantially reduced in the last few years. Both immigrants and nationals have contributed to crime rate growth. The arrival of immigrants has resulted in a lack of progress in the reduction of offences against property and in a minor increase in the number of offences against Collective Security (i.e. drugs and trafficking). In the case of nationals, their contribution to the increase in the crime rate is primarily concentrated in offences against persons. Econometric results confirm what we obtained in the descriptive section even after controlling for all the observed socioeconomic and demographic factors. The econometric section also allows us to seize the effect of immigration and to conclude that immigration matters in order to explain the crime rate but its importance should not be overstated.

We also provide an evidence of cultural differences in attitudes towards economic crime. Our estimation indicate that a higher proportions of American, non-UE European, and African immigrants tend to widen the crime differential, the estimated effect being larger for the latter ones. Furthermore, we have found that the gap in crime rates between immigrants and nationals tends to be reduced as the immigrants' share increases. We interpret this as the result of immigrants' integration, on the one side, and

that after the stock of resident immigrants is large enough, different communities reach a size which allows them to generate positive synergies, improving their socioeconomic prospects.

Our paper generally supports that labor market related conditions seem to supersede other potential explanations for the relationship between crime and immigration. However, given the limitations of the dataset and the available statistics of crime in Spain, our econometric analysis cannot exclude other alternative explanations such as ethnical related activities or misperceptions about the law. Cultural differences were statistically detected thus endorsing the view that some communities of immigrants might not see criminal law as a body of rules that captures their own views of society.

The implications of our analysis are that the relationship between crime and immigration should not be overstated but neither understated. Most probably policies should look at the roots of crime rather than at the immigration status, thus calling for better economic and social policies rather than specific legal interventions. If the main causes of the correlation between crime and immigration are economic in general, and labor market opportunities in the particular, then policies that address these root causes are more recommended. For example, it is possible to tailor immigration policies to reduce potential crime by favor high human over low human capital. It is also possible to develop policies to attract low crime immigration such as Northern European pensioners. However, there are important trade-offs in terms of labor demand.

Age is the main channel (although not the only one) through which immigration has led to an increase in the crime rate. For that reason, the relation between crime and immigration in Spain should be thought as part of a more general tradeoff that is facing the Spanish society. Immigration in Spain is economic immigration filling occupations in which (young) age is the main requirement. That labor force has allowed them to an important cycle of economic growth but no without costs.

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VI. APPENDIX

Table 5: CR Evolution by Nationalities. Shift-Share Decomposition (%).2000-2006

	1EU	1AM	1AF	1AS	2EU	2AM	2AF	2AS	3EU	3AM	3AF	3AS	TOTAL
Person	0.1	-1.1	1.1	0.0	-0.3	-1.1	0.6	0.4	0.0	-0.8	-0.2	0.0	-1.3
Property	1.4	-8.1	10.7	0.2	17.9	9.1	25.7	3.3	-1.0	6.8	-7.7	-0.1	58.1
Sexual Freedom	0.0	-0.5	0.4	0.0	0.3	0.4	0.8	0.1	0.0	0.3	-0.2	0.0	1.5
Drugs	0.1	-2.2	2.8	0.0	1.9	2.2	6.9	0.4	-0.1	1.6	-2.1	0.0	11.6
Falsifications	0.2	-2.9	1.8	0.1	1.7	3.3	4.3	1.1	-0.1	2.4	-1.3	0.0	10.5
Others	0.5	-3.0	4.5	0.0	5.3	2.6	9.9	1.0	-0.3	2.0	-3.0	0.0	19.5
TOTAL offences	2.3	-17.8	21.1	0.3	26.9	16.4	48.2	6.2	-1.4	12.3	-14.5	-0.2	100.0

Source: elaborated using MIR data

Fig. A.1 of dispersion: Percentage of VAB en Services and Construction Sectors *vs* Percentage of Immigrant Population and Immigrant Unemployment Rate.
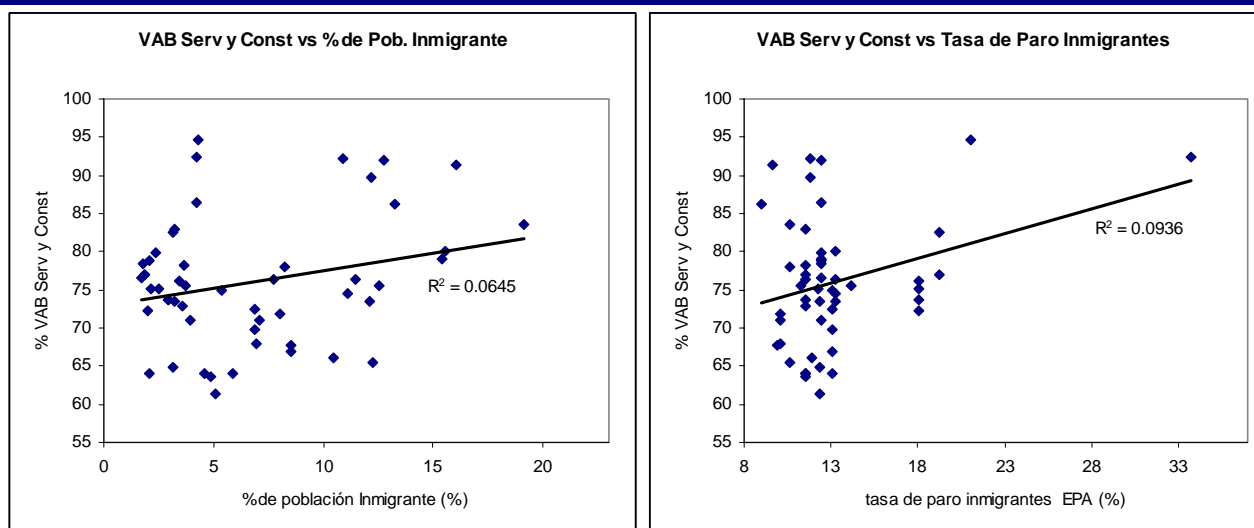
Table A1. Determinants of the crime rate OLS and within-province estimations				
Total crimes	Pool		Within	
% Immigrants / Pop.	30.0320	***	5.0796	
% Imm. Non-EU European	2.1855	*	4.1086	**
% Imm. Latin American	-0.2037		4.0567	**
% Imm. African	1.5425		3.6760	**
% Imm. Asian	4.3766		2.4320	
% Urban pop	0.9959	*	3.0957	
Unemp. Rate: Male nationals 20-50	5.1430			
Unemp. Rate: Male immig. 20-50	-0.3375		0.7797	
per capita GDP	-9.9860	**	9.6067	
Share of Male nationals 20-50	50.0281	***	35.2216	**
Share of Male immig. 20-50	-3.5234		1.5714	
% Educated Male nationals 20-50	6.1711	**	-3.3894	
% Educated Male immig. 20-50	-1.4024		1.3729	*
Avg. years of residence	30.5952	***	3.0875	
Lagged crime rate			-0.0092	
Property crimes				
% Immigrants / Pop.	8.9556	***	3.3073	
% Imm. Non-EU European	0.7952		4.6275	***
% Imm. Latin American	-0.2492		4.8778	***
% Imm. African	-0.1483		3.5389	**
% Imm. Asian	2.2848		-4.3162	
% Urban pop	0.1957		2.2751	
Unemp. Rate: Male nationals 20-50	4.6710	**	-0.8460	
Unemp. Rate: Male immig. 20-50	-0.1099		0.3734	
per capita GDP	-0.9776		43.0462	
Share of Male nationals 20-50	18.0893	***	4.6355	
Share of Male immig. 20-50	-1.6261		-3.5745	**
% Educated Male nationals 20-50	5.8121	***	4.9595	
% Educated Male immig. 20-50	-1.0345	*	-0.8748	
Avg. years of residence	3.9780		1.4474	
Lagged crime rate				
Minor crimes				
% Immigrants / Pop.	17.7173	***	5.7734	*
% Imm. Non-EU European	1.3808	*	1.1138	
% Imm. Latin American	0.5541		2.1124	
% Imm. African	1.3053		1.9846	
% Imm. Asian	2.6381		2.0297	
% Urban pop	0.6308		1.6124	
Unemp. Rate: Male nationals 20-50	2.5513		1.2625	
Unemp. Rate: Male immig. 20-50	-0.2077		0.6626	
per capita GDP	-5.7300	*	2.5940	
Share of Male nationals 20-50	31.8046	***	24.1460	**
Share of Male immig. 20-50	-2.5739		3.6000	*
% Educated Male nationals 20-50	2.6854		4.9225	**
% Educated Male immig. 20-50	-0.8961		1.0825	**
Avg. years of residence	5.1015		4.2096	
Lagged crime rate			-0.1366	**
N	416		364	

*, ** and *** denote significance at the 10 percent, 5 percent and 1 percent, respectively.

Year binary dummies included in all estimates.

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Table A2. Determinants of the crime rate GMM estimates				
Total crimes	(i)	(ii)	(iii)	(iv)
% Immigrants / Pop.	12.5718 *	13.6290 **	23.5083 ***	19.2389 ***
% Imm. Non-EU European		-1.4272		3.7778
% Imm. Latin American		-2.2312		0.7129
% Imm. African		-0.0245		2.3544
% Imm. Asian		3.8598		6.9936
% Urban pop			1.0110	1.9071
Unemp. Rate: Male nationals 20-50			5.0180	4.7440
Unemp. Rate: Male immig. 20-50			0.7649	1.1703
per capita GDP			-6.6851	-5.7053
Share of Male nationals 20-50			42.6559 ***	39.2528 ***
Share of Male immig. 20-50			-1.5208	-6.5992
% Educated Male nationals 20-50			2.0489	2.0935
% Educated Male immig. 20-50			-0.7031	-0.3271
Avg. years of residence			7.9139	7.2976
Lagged crime rate	0.7575 ***	0.6293 ***	0.1663	0.1300
p-value Sargan test	0.0084	0.0042	0.0092	0.0203
p-value AR(1) test	0.0040	0.0090	0.0250	0.0534
p-value AR(2) test	0.3746	0.3372	0.7558	0.9876
No. of instruments	17	21	26	30
Property crimes				
% Immigrants / Pop.	13.8857 ***	10.2456 **	7.4545 **	6.5123 **
% Imm. Non-EU European		-1.1211		1.7164
% Imm. Latin American		-1.6833		0.4027
% Imm. African		-0.7745		0.2644
% Imm. Asian		2.9204		4.2876
% Urban pop			0.1839	0.3580
Unemp. Rate: Male nationals 20-50			2.5316	2.6167
Unemp. Rate: Male immig. 20-50			0.1132	0.5025
per capita GDP			-2.2304	-3.3090
Share of Male nationals 20-50			21.3616 ***	20.9568 ***
Share of Male immig. 20-50			-1.5407	-2.8864 *
% Educated Male nationals 20-50			5.7510	6.0406 *
% Educated Male immig. 20-50			-1.1664	-1.1782
Avg. years of residence			-3.7756	-1.7156
Lagged crime rate	0.0444	0.0575	-0.0093	-0.0133
p-value Sargan test	0.0003	0.0005	0.0596	0.0998
p-value AR(1) test	0.1105	0.1161	0.0974	0.1044
p-value AR(2) test	0.3866	0.6945	0.3369	0.4207
No. of instruments	17	21	26	30

Table A2 (cont.) Determinants of the crime rate GMM estimates				
	(i)	(ii)	(iii)	(iv)
Minor crimes				
% Immigrants / Pop.	15.1892 **	12.4924 **	14.1659 ***	12.4264 **
% Imm. Non-EU European		-1.8252		3.2519
% Imm. Latin American		-3.1066 *		1.2307
% Imm. African		-1.0467		1.6818
% Imm. Asian		5.8221		7.1968
% Urban pop			1.0162	1.3662
Unemp. Rate: Male nationals 20-50			3.7674	4.4767
Unemp. Rate: Male immig. 20-50			0.5405	0.8324
per capita GDP			-7.6189	-5.3785
Share of Male nationals 20-50			33.3214 ***	30.4093 ***
Share of Male immig. 20-50			-0.3975	-4.6285
% Educated Male nationals 20-50			-0.0839	-0.2085
% Educated Male immig. 20-50			-0.4584	-0.3886
Avg. years of residence			13.5110	12.6398
Lagged crime rate	0.5061 ***	0.2313	-0.0608	-0.0537
p-value Sargan test	0.0007	0.0026	0.1254	0.1212
p-value AR(1) test	0.0020	0.0098	0.0088	0.0073
p-value AR(2) test	0.2870	0.4586	0.4522	0.4063
No. of instruments	17	21	26	30
N	364	364	364	364

*, ** and *** denote significance at the 10 percent, 5 percent and 1 percent, respectively.

Year binary dummies included in all estimates.

Table A3. Determinants of differential in conviction rates GMM estimates				
Total crimes	(i)	(ii)	(iii)	(iv)
% Immigrants / Pop.	-3.4487	-5.6698 **	-4.3120 **	-4.5546 *
% Imm. Non-EU European		-1.0620		0.1885
% Imm. Latin American		-1.1945 *		-0.3147
% Imm. African		0.7638		1.4353
% Imm. Asian		-0.7093		0.3056
Avg. years of residence			11.2077	4.1351
Unemp. Rate Differential			0.1844	0.4892 *
Education differential			-1.2166 *	-0.7310 *
Differential in Share of Male nationals 20-50			-1.4155 *	-2.8476
Lagged crime rate	0.4583 ***	0.4647 **	0.4570 ***	0.4944 **
p-value Sargan test	0.9112	0.6973	0.5091	0.5975
p-value AR(1) test	0.1841	0.2122	0.1991	0.2163
p-value AR(2) test	0.7348	0.7445	0.7726	0.7538
No. of instruments	16	20	20	24
Property crimes				
% Immigrants / Pop.	-0.6521 **	-1.6291 ***	-1.1713 ***	-1.0083 **
% Imm. Non-EU European		-0.2636		0.4494 **
% Imm. Latin American		-0.3146		0.3361
% Imm. African		0.4371 *		0.9234 ***
% Imm. Asian		-0.4269		0.6470
Avg. years of residence			3.4983 *	1.0166
Unemp. Rate Differential			0.1850	0.2187 **
Education differential			-0.3997 ***	-0.1749
Differential in Share of Male nationals 20-50			-0.3867 **	-1.5560 ***
Lagged crime rate	0.5730 ***	0.4643 ***	0.4235 ***	0.3660 **
p-value Sargan test	0.0824	0.0178	0.0790	0.4054
p-value AR(1) test	0.0351	0.0607	0.0675	0.1165
p-value AR(2) test	0.9006	0.8662	0.8427	0.8381
No. of instruments	17	21	21	25

	Table A3 (cont.). Determinants of differential in conviction rates GMM estimates			
	(i)	(ii)	(iii)	(iv)
Crimes against persons				
% Immigrants / Pop.	-0.1842 *	-0.3691 *	-0.1940	-0.3318 *
% Imm. Non-EU European		-0.0201		0.0517
% Imm. Latin American		-0.0610		-0.0083
% Imm. African		0.1106 *		0.1353 **
% Imm. Asian		0.0880		0.0154
Avg. years of residence			1.8559 ***	1.2881 **
Unemp. Rate Differential			0.0094	0.0200
Education differential			0.0033	0.0507
Differential in Share of Male nationals 20-50			0.1059 *	-0.0494
Lagged crime rate	0.6113 ***	0.5566 ***	0.5387 ***	0.5056 ***
p-value Sargan test	0.0210	0.0067	0.0032	0.0061
p-value AR(1) test	0.0233	0.0201	0.0184	0.0198
p-value AR(2) test	0.5799	0.5775	0.5460	0.5492
No. of instruments	17	21	21	25
N	364	364	364	364

*, ** and *** denote significance at the 10 percent, 5 percent and 1 percent, respectively.

Year binary dummies included in all estimates.

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