Trends & issues in crime and criminal justice

Abstract | Regulatory approaches to organised crime aim to minimise exploitation of the legitimate economy by offenders. Unlike criminal justice approaches, regulatory approaches prioritise prevention over enforcement.

This study explores the impact of a regulatory approach to organised crime in Queensland which restricted outlaw motorcycle gang (OMCG) members from working in certain industries. We exploit a delay in the implementation of these occupational restrictions after a wider suite of measures commenced, using interrupted time series analysis to analyse changes in organised crime related harm by OMCG members.

Results suggest that the introduction of occupational restrictions was followed by a gradual reduction in organised crime related harm by OMCG members (3% to 4% per month). While the reduction is small, it supports the view that regulatory measures are a promising strategy for reducing organised crime.

Regulatory approaches to preventing organised crime among outlaw motorcycle gangs

Christopher Dowling and Anthony Morgan

Australia's response to organised crime has relied on the criminal justice system, using strong enforcement and legal regimes to dismantle criminal groups, and deter or imprison offenders (Ayling 2017, 2014). Outlaw motorcycle gangs (OMCGs) have been the most visible target of these measures, given their prominence in Australia's organised crime landscape. Many Australian states and territories have adopted suites of laws which criminalise OMCGs and the association of their members. These laws have been introduced alongside dedicated police operations focused on disrupting the operation of OMCGs through high-intensity, low-tolerance enforcement activity.

Regulatory approaches rooted in civil and administrative law, meanwhile, are being increasingly used against organised crime in Europe (for a review, see Spapens, Peters & Van Daele 2015). These approaches focus on reducing opportunities for organised crime by blocking groups and offenders from elements of the legitimate economy that can enable it. This typically includes restrictions on the issuing of licences, permits, contracts, subsidies or grants, and the denial of real estate and other assets. Such measures can be critical to cutting off offenders from the funding streams, physical and technical infrastructure and mechanisms for concealing illicit revenue that facilitate organised crime.

Early examples of these approaches are evident in Italy (Calderoni & Di Stefano 2015; La Spina 2014) and Japan (Reilly 2014), which have long histories of private and public sector infiltration by mafia and yakuza crime organisations, respectively. More recently, the whole-of-government OMCG strategy introduced in the Netherlands best exemplifies the implementation of a regulatory approach to this offender population (van Ruitenburg 2020). Although it incorporates criminal justice measures as well, this strategy takes a broad view of disruption, with interventions coordinated across government targeting all of the conditions necessary for OMCGs to operate, including employment, finances and location.

There are recent examples of regulatory measures having been introduced in Australia, although they have typically been implemented within a broader criminal justice framework (Ayling 2017). Many Australian states and territories have now established regimes of judicial orders which restrict the activities of individuals with histories of organised crime related offending, including engagement in certain industries and financial activities. Recent changes to the *Transport Security Amendment (Serious Crime) Act 2021* aim to prevent exploitation of the aviation and maritime transport sectors—an enabler of organised crime—by introducing more stringent eligibility criteria for people applying for a card that would allow them to work in Australia's airports and seaports.

Regulatory approaches, used alongside criminal justice approaches, open up a wider variety of angles from which to target organised crime and particularly its enablers. Nevertheless, there is little local or international evidence to support the impact of these measures. Where research has been undertaken, it was often not able to completely disentangle specific regulatory interventions from other measures, making it difficult to infer the true source of any change. This is evident in a recent evaluation of the whole-of-government approach to OMCGs in the Netherlands (Klement & Blokland 2021). While results show that the introduction of this approach led to a gradual reduction in the rate of recorded organised crime offending by OMCG members, the wide range of criminal justice and regulatory measures incorporated make it challenging to identify the specific mechanisms at work.

Queensland context

In October 2013 the Queensland Government introduced a suite of measures to deal with OMCGs. Encompassing numerous acts and amendments, and two dedicated police task forces (Maxima and Takeback), these measures constituted a hardened approach to OMCGs, introducing new criminal offences and more severe penalties, increasing police powers and resources, and intensifying investigative and enforcement activity. Policing responses were further enhanced by the relocation of the Commonwealth's National Anti-Gangs Squad to Queensland to work alongside Taskforce Maxima. Implementation of these measures was facilitated by formally declaring 26 OMCGs as criminal organisations under the Criminal Code (Criminal Organisations) Regulation 2013 (Qld). These measures saw substantial increases in the arrest and charging of gang members (Goldsworthy 2015; Queensland Police Service (QPS) 2015, 2014; QPS Strategic Monitoring Team 2014).

This suite of measures included occupational licensing restrictions on members of OMCGs. This effectively prevented them from legally gaining employment in a range of industries, including but not limited to the tattoo, liquor, security, weapons and construction industries, with an aim of protecting these industries from criminal exploitation. Importantly, there is some empirical backing for these measures, despite the lack of research directly evaluating them. While employment can reduce offending among current and former prisoners (Apel & Horney 2017; Ramakers et al. 2017), and can be critical to maintaining desistence among former gang members (Tonks & Stephenson 2019), evidence also shows that employment comes with a range of illicit opportunities (van der Geest, van Koppen & Kleemans 2020; van Koppen, van der Geest & Kleemans 2020).

Unlike the criminal justice measures introduced in October 2013, which came into immediate effect, occupational restrictions commenced gradually between July 2014 and July 2016. A review of the 2013 laws by Queensland's Taskforce on Organised Crime Legislation (2016), which eventually contributed to their repeal and amendment in December 2016, criticised the inadequate review and appeal rights and the burdensome requirement that all licence applications be referred to the Commissioner of the Queensland Police Service. Nevertheless, this review found that, as of December 2015, around 25 licence applications pertaining to certain industries had been refused due to OMCG affiliations. These refusals have obvious direct implications for applicants but could also have disproportionately affected broader ongoing criminal enterprises. Refusing applications also has the potential to deter OMCG members from working in these industries and to deter employers and recruiters in these industries from employing OMCG members. The latter possibility was borne out in the findings of a recent study by Boland and colleagues (2021) examining former OMCG members in Queensland, a number of whom noted difficulties gaining employment due to their OMCG affiliations.

The legal environment regarding OMCGs in Queensland between October 2013 and December 2016, and particularly the staggered implementation of occupational restrictions nine months after the introduction of intensified criminal justice measures, offers a unique opportunity to empirically analyse a domestic regulatory approach to organised crime.

Aim and methods

This study examines the potential short-term impact of a regulatory approach to preventing organised crime in Australia. It addresses whether the regime of occupational restrictions for OMCG members implemented in Queensland from July 2014 was followed by a reduction in the harm associated with their organised crime activity.

Sample and data

Data on the criminal histories of Australian OMCG members were obtained by linking two Australian Criminal Intelligence Commission databases: the National Gangs List (NGL) and the National Police Reference System. Established in 2014, the NGL is a secure, validated and nationally agreed-upon list of OMCGs and their members in Australia. The National Police Reference System holds national police information on individuals, including their apprehension histories. (See Morgan, Dowling & Voce 2020 for further information on these databases.) The dataset codes offence descriptions using the Australian and New Zealand Standard Offence Classification (ANZSOC) scheme (Australian Bureau of Statistics 2011) and includes information on the month of each offence and the jurisdictions in which offences were committed. Both databases are used for operational and intelligence purposes and are updated regularly. Data from both databases were extracted by researchers in May 2019.

This study examined all organised crime related offending recorded in Queensland between January 2011 and December 2016 (inclusive) by men who were recorded on the NGL as members of an OMCG in Australia as of May 2019. Organised crime related offending consists of ANZSOC offence codes synonymous with an 'ongoing criminal enterprise', as defined by Quinn and Koch (2003) and operationalised by Morgan, Dowling and Voce (2020). Broadly, these offences include serious fraudulent activity, serious regulatory offences and the commercial production and supply of illicit drugs, unregistered firearms or other illicit commodities. The analysis was restricted to men who were added to the NGL in 2014 (its first year of operation) or 2015. It also excluded OMCG members who were born after 1992, leaving only those members who were 18 years or over at the beginning of the study period. Finally, since the dataset did not include those who were members during the study period but left their gangs and were removed from the NGL before data were extracted by researchers (May 2019), these former members were omitted from the study.

Analytic strategy

Measuring organised crime related harm

This study explored changes in the amount of harm related to OMCG members' organised crime activity following the introduction of occupational restrictions. Organised crime related offences, even among OMCGs, are rare occurrences in police administrative datasets, and small changes in the number of offences and offenders can mask significant changes in the extent and impact of organised crime.

The Western Australian Crime Harm Index (WACHI; House & Neyroud 2018) was used to measure organised crime related harm. The WACHI assigns a harm score to offences indicative of the estimated physical, psychological, interpersonal, economic and social damage they cause. In effect, each score represents the median prison sentence (in days) passed down to first-time perpetrators of an offence type in Western Australia between January 2010 and June 2017. There are many recent examples of equivalent harm indices being used to evaluate the impact of interventions to reduce crime harm (eg Bland et al. 2021).

WACHI scores were developed to align with offence codes used in Western Australia, which only partially correspond to ANZSOC offence codes. We addressed this issue by estimating a single harm score for all ANZSOC offence codes that were previously missing them or had more than one assigned. Harm scores were assigned to previously unscored offence codes based on scores assigned to closely related offences. Where more than one harm score was assigned to an ANZSOC offence code, the mean of these harm scores, weighted by the number of cases used to calculate the original harm score, was taken.

Based on this revised WACHI, the most harmful organised crime related offence in the dataset was the commercial supply of illicit drugs (178) and the lowest harm offence was illicit betting and gambling activities (3). Harm scores for all organised crime related offences committed in Queensland by OMCG members were summed for each month, generating a time series dataset for analysis. The highest harm organised crime related offence type originally classified by Morgan, Dowling and Voce (2020)—importing/exporting illicit drugs (1,309)—was not recorded at any point during the study period. Additionally, none of the new criminal offences created under the suite of legislation that commenced in Queensland in October 2013 were classified as organised crime related offences.

Interrupted time series analysis

This study undertook interrupted time series analysis to examine changes in the harm of OMCG members' organised crime activity following the introduction of occupational restrictions. Because the study period ran from January 2011 to December 2016 (inclusive), the analysis covered 42 months prior to the restrictions (January 2011 to June 2014) and 30 months after the restrictions were introduced (July 2014 to December 2016), or a total of 72 time points.

Interrupted time series analysis is an analytic approach to evaluating an intervention that tracks an outcome variable over multiple points in time before and after the intervention's introduction, accounting for underlying trends that are unrelated to it (Box et al. 2015; Hyndman & Athanasopoulos 2021). It was implemented in this study with auto regressive integrated moving average (ARIMA) modelling, which is well equipped to handle three common issues in time series data that can obscure an intervention's true impact:

- autocorrelation and partial autocorrelation, or the correlation of values in a time series with values at previous times;
- non-stationarity, or variation in the statistical properties of a time series dataset over time, including the means, variances and covariances; and
- seasonality, or the tendency for values in a time series to fluctuate systematically at seasonal intervals—usually every three, six or 12 months.

Interrupted time series ARIMA models incorporate covariates to account for these non-intervention related trends in order to detect changes in an outcome (in this case, organised crime related harm by OMCGs) that coincide with, and can reasonably be linked to, the timing of an intervention (in this case, the introduction of occupational restrictions). Generating an ARIMA model involves assessing whether data transformation is required to account for non-stationarity, and selecting covariates that best account for patterns of autocorrelation and partial autocorrelation. Where seasonality is detected, additional covariates are included in the model to account for it.

Model selection in this study was facilitated by an automatic search algorithm developed by Hyndman and Khandakar (2008) and implemented in the statistical software program R. This algorithm iteratively compares successive ARIMA models and identifies the best fitting model. Model selection was aided by visual inspection of the time series data and the autocorrelation and partial autocorrelation function plots, along with Augmented Dickey–Fuller and Kwiatkowski–Phillips–Schmidt–Shin testing for non-stationarity. Follow-up Ljung–Box testing was undertaken post-model estimation to ensure that there was no remaining autocorrelation in model residuals. Model fit was assessed through inspection of the corrected Akaike information criterion (AICc).

Limitations

This study relied on recorded apprehension data, which does not include offending that did not come to the attention of police. Additionally, information on time spent in custody, and by extension exposure time, could not be obtained. However, incapacitation was accounted for to some extent through the operationalisation of covariates to capture the impact of criminal justice measures introduced in October 2013 (outlined further in the next section).

The staggered introduction of Queensland's suite of responses to OMCGs in the mid-2010s offers a unique opportunity for evaluation, and the analytic strategy minimises many sources of bias in examining the impact of occupational restrictions. However, there are a lack of suitable control jurisdictions against which to compare Queensland due to the sporadic introduction of a wide variety of OMCG-specific measures across Australia's other states and territories during the study period (Bartels, Henshaw & Taylor 2021). This limits the internal validity of findings and the potential for causal inferences.

While the NGL is a comprehensive and authoritative census of Australian OMCG membership used by law enforcement agencies across the country, it does not retain information on former members. Additionally, the dates on which men are added to the NGL do not align with the dates they joined an OMCG, which are rarely known. Because of this, the dataset used in this study approximates OMCG membership during the study period, again limiting the generalisability of findings.

Finally, Queensland's Taskforce on Organised Crime Legislation (2016) concluded that the resources devoted to implementing occupational restrictions were disproportionate to the risks posed by OMCGs. Given the absence of data appropriate for costing, this study was not able to examine the economic viability of Queensland's occupational restrictions, and no conclusions are drawn as to whether the impacts justify the costs. Rather, this study aims to fill a gap in the knowledge base by examining whether there was likely to have been any crime reduction impact in the first place.

Results

Descriptive analysis and model development

Figure 1 plots the raw monthly organised crime related harm associated with recorded offences by OMCG members in Queensland between January 2011 and December 2016. Given the gradual implementation of Queensland's occupational restrictions, it was expected that any change in organised crime related harm would also occur gradually, appearing graphically as a downward trend as opposed to an immediate drop in the level of harm. These changes are diagrammed for illustrative purposes in Figure 2, with a comparison showing no change. To test for this downward trend change, occupational restrictions were operationalised into an intervention variable, coded as zero up to July 2014 and increased by one for every subsequent month, for inclusion in the ARIMA model.

Figure 1: Monthly organised crime related harm, as measured by the WACHI, by outlaw motorcycle gang members in Queensland, 2011–2016
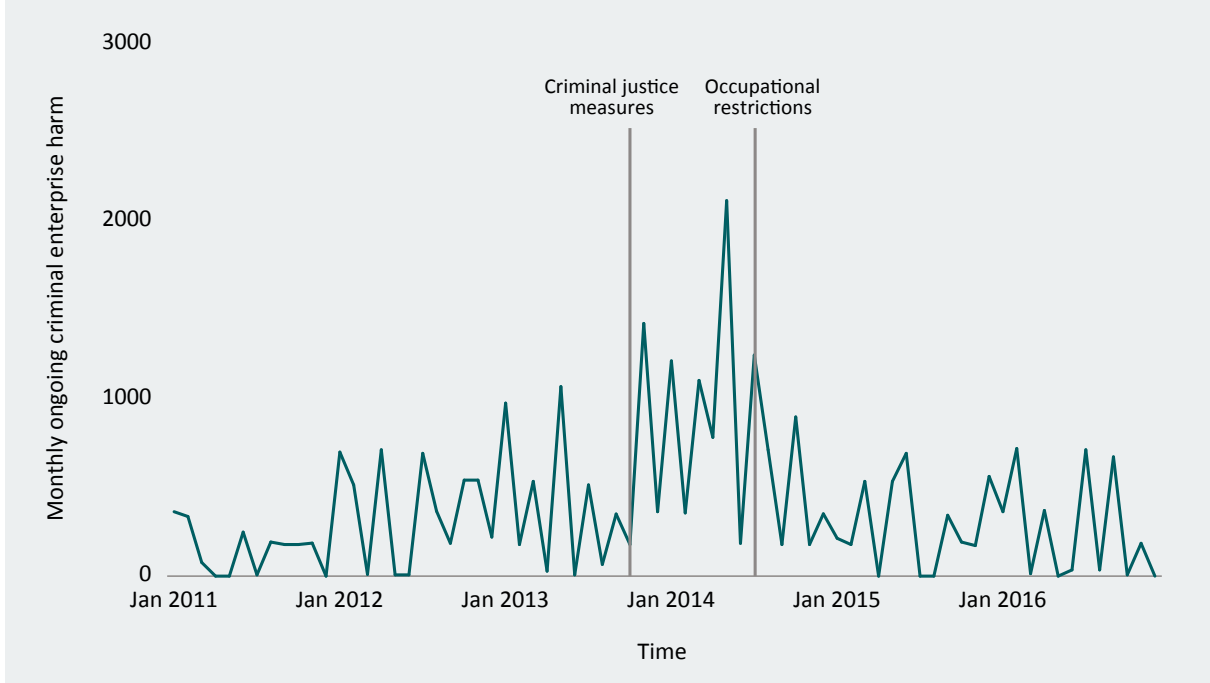
Source: OMCG criminal history dataset [2019]

Figure 2: Illustration of post-intervention trend and level reductions in an outcome measure
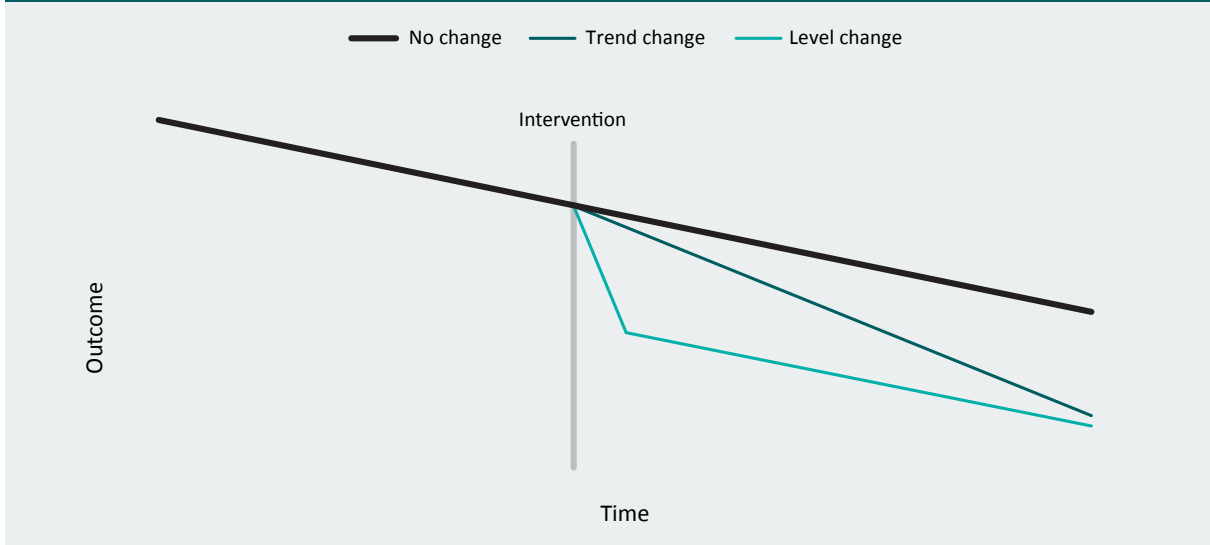
Importantly, Figure 1 shows a sharp, short-term increase in harm following the introduction of the criminal justice measures in October 2013. This likely reflects a surveillance or detection effect, as police increasingly targeted OMCG members and identified more organised crime activity (Goldsworthy 2015; QPS 2015, 2014; QPS Strategic Monitoring Team 2014). There is an equally notable decay in this short-term spike around the time occupational restrictions were introduced. Much of this decay could reflect the incapacitation of OMCG members—through imprisonment, remand, community sentences or bail conditions—for offences detected in the months after October 2013, the delayed deterrent effect of criminal justice measures, a tapering off in the intensity of these measures, or some combination. Failing to account for this spike in harm, and its subsequent decay, risks greatly overestimating the impact of occupational restrictions. The challenge was to identify any reduction in harm within this broader decay that could reasonably be linked to occupational restrictions.

This required the inclusion of an additional covariate in the ARIMA model that captured both the immediate increase in harm following the introduction of the criminal justice measures and its decay. The immediate increase was operationalised as a level change, coded as zero before October 2013 and one from October 2013 up to the point of decay. Because it was unclear when this spike started to decay, a data-driven approach was used to determine its point of onset. This was achieved with changepoint analysis, which is a family of methods for inductively identifying points in a time series dataset at which there are meaningful changes in one or more of its statistical properties (Aue & Horváth 2013). A level change in monthly harm after the introduction of criminal justice measures was identified with a segment neighbourhood approach (Auger & Lawrence 1989). This approach was implemented in the statistical software program R using the 'changepoint' package (Killick & Eckley 2014). The search was constrained to one changepoint, with an Akaike information criterion penalty applied to prevent overfitting.

Changepoint analysis indicated a level drop in monthly harm at May 2014. This was taken as the onset point for decay in all criminal justice covariates. Since the rate of decay was also unknown, we decided to examine Queensland's occupational restrictions with multiple ARIMA models, each incorporating a different criminal justice covariate, operationalising decay as sudden (exponential), constant (linear), gradual (reverse exponential) or non-existent. These are diagrammed for illustrative purposes in Figure 3.

Prior to the main analyses, each model was run as an ordinary least squares regression and the resulting collinearity diagnostics were used to determine whether the criminal justice and occupational restriction covariates were too highly correlated. Tolerance values less than 0.1 were taken as indicative of collinearity. Based on this threshold, there was no evidence of collinearity across any of the models.

Importantly, while ARIMA models included covariates for the criminal justice measures introduced in Queensland in late 2013, it must be emphasised that the aim of this study was not to evaluate these measures, and conclusions about their effectiveness cannot be drawn from the results. These measures encompassed multiple enforcement, investigative, intelligence and legal responses, all implemented at around the same time to achieve various outcomes.

Figure 3: Illustration of different operationalisations of the criminal justice elements of Queensland's 2013 suite of outlaw motorcycle gang measures
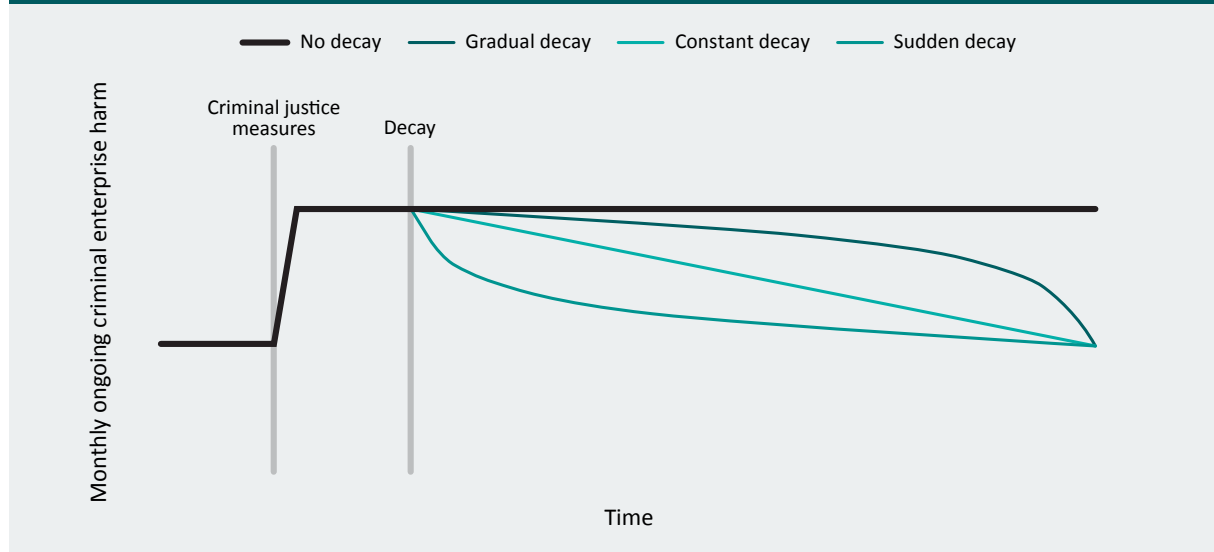
Note: Variables operationalising decay in the spike in monthly ongoing criminal enterprise harm between the introduction of criminal justice measures *(CJ)* and decay onset *(D)* are coded over time *(t)* in relation to occupational restrictions *(OC)* as follows. No decay: 0 if *t <CJ* and 1 if *t ≥ CJ*. Gradual decay: 0 if *t < CJ*, 1 if *t ≥ CJ* and *<OC*, and $1+\log_{100}((t-72)/((OC-1)-72))$ if *t ≥ D*. Constant decay: 0 if *t <CJ*, 1 if *t ≥CJ* and *<OC*, and $(72-t)/(72-(OC-1))$ if *t ≥ D*. Sudden decay: 0 if *t <CJ*, 1 if *t ≥ CJ* and *<OC*, and $1\times\log_{100}((72-(t-(OC-1))/(72-OC)))$ if *t ≥ D*

Results of Augmented Dickey–Fuller and Kwiatkowski–Phillips–Schmidt–Shin testing indicated significant non-stationarity in the variance of the data. Monthly harm totals were logarithmically transformed to induce stationarity before further analysis. For each ARIMA model, the automatic search algorithm was programmed to search across seasonal and non-seasonal models. However, seasonal differencing was not induced with the specification of a differencing term, as autocorrelation function and partial autocorrelation function plots of the transformed data showed no statistically significant autocorrelations at lags suggestive of seasonality (ie lags of 3, 6 or 12 months).

Was the introduction of occupational restrictions followed by a reduction in harm?

Table 1 summarises the results of the final ARIMA models examining changes in the organised crime related harm caused by OMCG members following the introduction of Queensland's occupational restrictions, controlling for different operationalisations of its criminal justice measures. There was no evidence of autocorrelation in the residuals of any models up to 24 lags, as indicated by non-significant Ljung–Box tests.

Table 1: ARIMA models examining changes in the organised crime related harm of OMCG members following the introduction of Queensland's occupational restrictions

	Model 1: No decay	Model 2: Gradual decay	Model 3: Constant decay	Model 4: Sudden decay
Covariate coefficients (95% confidence interval)[a] and effect size measures				
Occupational restrictions	−0.091 (−0.150, −0.033)*	−0.062 (−0.110, −0.014)*	−0.038 (−0.074, −0.003)*	−0.028 (−0.064, 0.008)
Estimated monthly post-intervention change attributable to occupational restrictions[b]	↓8.7%	↓6.0%	↓3.7%	↓2.8%
Criminal justice measures	1.522 (0.411, 2.632)***	1.455 (0.414, 2.495)***	1.585 (0.437, 2.732)***	1.962 (0.536, 3.387)***
Model statistics				
AICc	302.7	302.4	302.4	302.6
Log likelihood	−147.0	−146.9	−146.9	−147.0
Ljung–Box χ^2	11.2	11.7	11.1	10.5

***statistically significant at $p<0.001$, *statistically significant at $p<0.05$

a: Coefficients and 95% confidence intervals reflect log-transformed data

b: The estimated monthly change post-intervention reflects the trend change in monthly harm totals between July 2014 (the month in which occupational restrictions were introduced) and December 2016 (the end of the study period), and was calculated as follows: $(1 − exp_{β1}) \times 100$, where β1 = occupational restrictions coefficient

Note: AICc=Akaike information criterion (corrected)

Source: OMCG criminal history dataset [2019]

There was a four- to seven-fold increase in the level of organised crime related harm with the introduction of the criminal justice measures. Statistically significant trend reductions in organised crime related harm were found after the introduction of occupational restrictions in all but the ARIMA model assuming sudden decay (model 4). Under the unlikely scenario of no decay (model 1) results suggest that organised crime related harm decreased by nine percent per month after the introduction of occupational restrictions. Where gradual decay was assumed (model 2), results suggest a six percent monthly reduction, and where constant decay was assumed (model 3), results suggest a reduction of less than four percent monthly.

While the actual rate of decay cannot be confirmed, a constant rate of decay is, in the authors' view, the most plausible. Model 3, which examines occupational restrictions under the scenario of constant decay, was (along with model 2—gradual decay) the best-fitting model (ie an AICc closest to zero). For sudden decay to be plausible, it would need to be explained by an intervention such as the arrest or incapacitation of a large number of OMCG members, or a sudden cessation of policing activity, and the interruption would have to be similar in magnitude to the suite of OMCG measures introduced in October 2013. There is no evidence for either scenario in the material documenting police activity against OMCGs in Queensland during the study period (Goldsworthy 2015; QPS 2015, 2014; QPS Strategic Monitoring Team 2014; Taskforce on Organised Crime Legislation 2016). Meanwhile, assuming anything less than constant decay results in a questionably large effect size for an intervention that targeted only a small subset of organised crime methodologies and that could only be expected to have a small impact on organised crime activity among OMCGs.

Further sensitivity analyses were undertaken using the model 3 scenario of constant decay. Models were run incorporating artificial occupational restriction covariates which operationalised their commencement three months (April 2014), two months (May 2014) and one month (June 2014) prior to their actual commencement. The fit of these models, as measured by the AICc, was compared with that of model 3 in the main analysis to determine whether the trend reduction detected in the main analysis predated the introduction of occupational restrictions in July 2014. Across all three models, the AICc was slightly higher than that of model 3 in the main analysis (302.4), indicating poorer model fit (Table 2). This further supports the notion that a small and gradual trend reduction in the organised crime related harm caused by OMCG members in Queensland coincided with the introduction of occupational restrictions.

Table 2: Sensitivity analyses with ARIMA models examining artificial occupational restriction covariates at different points of onset prior to actual implementation in July 2014			
	April 2014, constant decay	May 2014, constant decay	June 2014, sudden decay
Coefficients (95% confidence interval)[a] and effect size measures			
Occupational restrictions	−0.035 (−0.072, −0.002)*	−0.036 (−0.072, −0.003)*	−0.037 (−0.073, −0.003)*
Criminal justice measures	1.645 (0.498, 2.792)***	1.624 (0.477, 2.770)***	1.604 (0.457, 2.750)***
Model statistics			
AICc	302.6	302.5	302.5
Log likelihood	−147.0	−146.9	−147.0
Ljung–Box χ^2	11.0	11.0	11.0

***statistically significant at *p*<0.001, *statistically significant at *p*<0.05

a: Coefficients and 95% confidence intervals reflect log-transformed data

Note: AICc=Akaike information criterion (corrected)

Source: OMCG criminal history dataset [2019]

Discussion

Findings from this study suggest that the introduction of occupational restrictions on OMCG members in Queensland from July 2014—part of a suite of measures implemented by the Queensland Government to combat OMCGs—was followed by a small and gradual reduction in their organised crime related harm. Estimates vary according to the assumptions used in the modelling, with results ranging from no significant reduction to a reduction of almost nine percent per month in organised crime related harm. The most plausible outcome is that these restrictions were followed by a three to four percent monthly reduction in organised crime related harm. This study offers the first Australian evidence for the potential impact of occupational restrictions on organised crime and, more broadly, for the potential effectiveness of regulatory approaches to organised crime.

Occupational restrictions, like most regulatory measures, are a form of opportunity reduction in that they prevent would-be offenders from exploiting elements of the legitimate economy to engage in organised crime. However, it is difficult to discern from these results whether this is likely to have been achieved through the actual refusal of jobs to OMCG members or through wider deterrence. While the final report of Queensland's Taskforce on Organised Crime Legislation (2016) notes only a small number of licence refusals under this regime, research has hinted at the widespread difficulties many men with OMCG affiliations in Queensland experienced gaining employment during this period (Boland et al. 2021), suggesting at least some deterrent effect. Nevertheless, the principal mechanism by which occupational restrictions are likely to have reduced organised crime is unknown.

Critically, it should be remembered that occupational restrictions were applied solely on the basis of an individual being affiliated with an OMCG, whether or not they had an accompanying police record of serious or organised crime. This highly controversial approach has since given way, in Queensland and elsewhere, to individually targeted judicial orders that set a stricter threshold for applying restrictions and that can only be issued by courts post-conviction. Queensland's Taskforce on Organised Crime Legislation (2016) also proposed a number of other mechanisms by which restrictions could be applied, including a 'blue card' system similar to that regulating occupations that involve working with children in Queensland, which also relies on prior convictions.

The decision to examine the occupational restrictions implemented in Queensland between 2014 and 2016 was made purely to take advantage of a unique opportunity for evaluation. Considered from an empirical perspective, the individual targeting of regulatory measures based on higher legal thresholds might reduce their effectiveness by limiting the pool of individuals to whom they apply. Conversely, regulatory measures might increase in efficacy if they extend beyond the formal membership of 'declared' organisations, taking account of the fluid structures of many organised crime groups and networks, in which people constantly move into and out of them (Bouchard & Morselli 2014; Morselli 2009).

It is also worth noting that these results have emerged alongside those highlighting the important role employment can play in disengagement from criminal lifestyles (Apel & Horney 2017; Ramakers et al. 2017; Tonks & Stephenson 2019). The former OMCG members interviewed in Boland and colleagues' (2021) research highlighted employment as a critical source of material and social support, and important to helping them stay disengaged from their gangs. Occupational restrictions, and regulatory approaches more broadly, must balance a concern for preventing exploitation of the legitimate economy with the need to provide access to this economy in support of offender desistence (Douglas & Smith 2018).

Although promising, and with significant implications for policy, these findings highlight the pressing need for further research to build the evidence base on whether and how regulatory approaches can reduce organised crime. It is also important to read these findings against the limitations discussed. Most notably, the ability to make definitive causal claims about the impact of occupational restrictions is somewhat limited by the complicated legislative and policing environment in which they were introduced, and uncertainty regarding the true impact of other measures introduced to combat OMCGs. While a number of methods were used to disentangle occupational restrictions from other measures introduced at around the same time, it is not possible to infer a causal impact with complete confidence. More than many other interventions, the evidence base for regulatory approaches would benefit from further research that evaluates them across multiple locations and contexts.

This study attempted to measure the possible short-term impact of a regulatory approach to organised crime by OMCG members in Australia. Findings highlight the potential utility of measures outside the criminal justice system in preventing this form of crime. Measures like these should be subjected to more rigorous studies, including prospective studies, to build an evidence base of alternative strategies to reduce the significant burden of organised crime to the Australian community.

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