

Recidivism in Switzerland: the influence of custodial sanctions

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Summary

AIMS OF THE STUDY: Although many studies have investigated the influence of personal characteristics on recidivism, knowledge about the impact of correctional policies remains limited. The present study adds to this debate by investigating the effect of the dualistic system of custodial sanctions in Switzerland over time. Specifically, we: (1) tested the influence that different types of custodial sanctions – sentences (offering regular prison treatment) and measures (offering crime-related rehabilitation programmes) – have on reconviction rates; and (2) forecasted future reconviction rates to estimate their value in the year 2020.

METHODS: National level data from the Swiss Federal Statistical Office were collected, including 3-year reconviction rates after release from custody and the number of persons serving custodial sentences and measures. A time series framework was used for the analyses, which included data available from 1988 to 2013 ($n = 26$ years).

RESULTS: The number of persons serving custodial sentences had no effect on recidivism ($p = 0.582$); however, a higher number of persons serving custodial measures was significantly associated with a decrease in recidivism ($p = 0.003$). For the year 2020, a reconviction rate of 28% (range 23–33%) was predicted.

CONCLUSIONS: Custodial measures seem to be associated with a reduction in recidivism. However, owing to the indeterminate time associated with some custodial measures, often at the cost of the prisoners' rights and the criminal justice system, future studies are needed to determine the optimal serving time for custodial measures.

Introduction

Reducing recidivism has been a major concern for governments worldwide to increase public safety and reduce financial costs [1]. However, recidivism rates remain quite high and varied, with 2-year reconviction rates ranging from 20% to 63% across 23 countries [2]. Accurately quantifying recidivism rates and further understanding the

factors associated with reoffending can assist in developing crime prevention strategies [3].

Recidivism research is important for a variety of correctional contexts. For instance, knowledge of recidivism rates informs decision making in forensic evaluations of offender-related threat; is useful for determining sentence type and length in court; helps to determine offender classification, treatment, and parole in prison settings; and helps evaluate supervision needs during post-release probation [4]. Furthermore, recidivism rates can be used as a measure of performance of the criminal justice system, which includes the impact that policies, practices and programmes have in reducing recidivism [5]. In addition, understanding the factors associated with recidivism helps develop methods and tools for the assessment of offenders, as well as effective policies and programmes for their rehabilitation [6].

Many studies have investigated the influence of personal characteristics on recidivism, but the impact of correctional policies is less understood. At the individual level, characteristics such as younger age, single status, low socioeconomic status, criminal history, antisocial peers, substance abuse and mental health problems have been associated with recidivism [7–10]. However, policy decisions, such as the assignment of offenders to different types of sanctions, can also influence recidivism. For instance, systematic reviews indicate that, compared with non-custodial sanctions, incarceration has a slight criminogenic effect on future criminal behaviour, especially among low-risk offenders [11–15].

Nevertheless, incarceration is a necessary sanction for dangerous offenders and may have varying effects on the individuals, depending on their programme participation. In a longitudinal study that followed up 5469 adult male prisoners in Canada for 2 years after release, Smith and Gendreau [16] observed that, for high-risk offenders, the positive impact of incarceration on recidivism varied based on whether or not they received appropriate rehabilitation (crime-related rehabilitation programmes – employing behaviour-based approaches and/or targeting criminogenic needs). Low-risk offenders were negatively influenced by

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incarceration, regardless of the type of programming received. Therefore, it is possible that, among high-risk offenders, different types of custodial sanctions – with a higher or lower focus on rehabilitation – differentially influence recidivism rates. This may be the case with the dualistic system of sanctions in Switzerland.

In Switzerland, sanctions fall into two categories: sentences and measures [17]. Sentences (custodial sentences and monetary penalties) are largely retributive in nature and also aim to prevent future criminal behaviour. Custodial sentences are usually executed in regular prison units, offering diverse work and training opportunities, aiming to rehabilitate offenders by mostly promoting their personal and social skills. In contrast, measures are primarily preventive in nature, aiming to protect society from dangerous offenders by either rehabilitation (therapeutic measures such as treatment of mental disorders and addictions, and therapies for young adults suffering from serious developmental disorders) or incapacitation (indefinite incarceration; especially for violent and sexual offenders who, because of their personality traits or mental health issues, are highly likely to recidivate with severe offenses and for whom there is minimal chance of success in terms of therapeutic interventions) [18]. Measures are usually ordered if a sentence alone is considered insufficient to prevent recidivism. Therapeutic measures focus on criminogenic needs and can be executed either in custody or as an outpatient regimen. For measures in custody, different specialised facilities exist (e.g., intervention centres, psychiatric clinics, or – in the case of increased risk of escape – prison units). If the conditions for both a custodial sentence and a custodial measure are met, the court may order both sanctions. In this case, the sentence is deferred in favour of the measure, and the offender is released after successful treatment. Differently, indefinite incarceration is applied after the execution of the sentence.

Because custodial measures target dangerous offenders and have a more intense focus on rehabilitation (especially therapeutic ones) than custodial sentences, these sanctions may impact recidivism differently. Indeed, over time, recidivism rates have decreased in Switzerland. At the same time, more people have been serving custodial measures, with an increase from 13% to 37% of the total custodial population during the last 30 years. This increase is associated with the fact that, despite a steady decrease in the number of new admissions, the average time spent serving custodial measures has almost tripled, from 677 days to 1958 days [19]. Besides Switzerland, a reduction in recidivism has also been observed in other regions, including elsewhere in Western Europe, the United Kingdom, the United States and Australia [20–24]. In addition to potential changes in the offender population (e.g., age, criminal history and risk level), sociocultural factors (e.g., economic crisis), and legislation (e.g., penal code revisions), the drop in recidivism may also be related to increased government efforts towards offender rehabilitation [1].

In order to assess the dualistic system of custodial sanctions in Switzerland over time, the objectives of the present study are two-fold: (1) to test whether the number of persons serving custodial sentences vs custodial measures has an effect on reconviction rates and (2) to predict future reconviction rates (until the year 2020). Based on prior re-

cidivism research and official statistics in Switzerland, we hypothesised that: (1) a higher number of persons in custodial measures would result in lower rates of recidivism, but the number of persons serving custodial sentences would not have an impact on recidivism and (2) reconviction rates will continue to decrease over time.

Materials and methods

Sample and procedures

Data were obtained from the Federal Statistical Office (FSO) website [19], which is a public source of a variety of nationwide statistical data collected over time, including data related to crime and criminal justice. This includes data on recidivism rates and the execution of criminal sanctions, which are variables for our current study. We obtained recidivism data on reconviction after release of offenders from 1988 to 2013. As the data were publicly available for only six of those years (i.e., 1988, 1993, 1998, 2003, 2008 and 2013), we requested the FSO to provide us the data for the remaining years. FSO data utilised in this study corresponds to the database as of 4 November 2019 (the presented recidivism values can change in newer publications, as more information is added to the FSO database). The data on the sanctions included information on the total number of persons executing custodial sentences and custodial measures between 1984 and 2018. Because the recidivism data focused on the Swiss population, only the number of Swiss citizens serving different sanctions was considered. As the available data for the analyses spanned from 1988 to 2013, our sample size was 26 years (mean 1591 persons per year). As this study used freely available data from the FSO and no individual records (only aggregated data) were obtained, no ethical approval was required.

Study variables

Recidivism

Recidivism was defined as the percentage of offenders who were reconvicted in a given year. This included all Swiss adults (18 years or older) who were reconvicted for committing a new felony or misdemeanour under the main federal laws (Swiss Criminal Code, Narcotics Law, and Road Crimes Law) within 3 years of discharge from a custodial sanction (incarceration) with a serving period that was longer than 6 months. The data did not include foreigners (as it was not possible to distinguish between foreigners living in Switzerland and those living abroad), juveniles (10 to 17 years; unlike to adults, they can be convicted on the basis of a contravention), and contraventions and infringements of cantonal laws (usually not recorded in the register of convictions).

Custodial sanctions

Custodial sanctions are separated into two categories: sentences and measures. Sentences were quantified based on the average annual number (as estimated by the FSO, based on five data collections per year) of Swiss adults serving a custodial sentence (prison), including custodial sentences that replace monetary penalties. Measures were quantified based on the average annual number of Swiss adults serving a custodial measure, which combines in-

definite incarceration (“Verwahrung”, Article 64 SPC) and therapeutic measures (“Massnahmen”, Articles 59–61 SPC), including inpatient treatment for offenders with severe mental disorders (Article 59 SPC), offenders with addictions (Article 60 SPC), young adults (under 25 years) who suffer from a serious developmental disorder (Article 61 SPC), and other (unspecified) inpatient measures.

Custodial measures are usually ordered if there is a high recidivism risk due to one of the aforementioned conditions, if the condition manifested itself during the offense, if a sentence alone cannot reduce the recidivism risk, and if the specific measure is deemed proportional. The referral depends primarily on the type of problem (severe mental disorder, addiction, developmental disorder, or otherwise dangerous but not psychiatrically ill person) and treatability: If an individual is deemed treatable, therapeutic measures will be ordered. If an individual is assessed as untreatable, indefinite incarceration can follow.

Although it would have been interesting to analyse the effect of specific custodial measures (e.g., treatment of severe mental disorders) on recidivism rates over time, the FSO provides detailed information on measures for the overall custodial population only (Swiss and foreigners combined). For the Swiss population, the information is combined in this overall measure of the number of persons in custodial measures.

Statistical analyses

Because the interdependencies between recidivism and custodial sanctions were studied over several years, a time-series framework was used for the analyses. To model the interdependencies, vector autoregressive (VAR) models were employed. The VAR model is a multivariate time-series regression model, which is structured such that each variable is a linear function of past lags of itself and past lags of other variables, assuming stationarity [25].

As different tests suggested that the three study variables (recidivism, sentences and measures) had a unit root, they were made stationary using first-order differencing. Based

on lag-order selection and exclusion statistics, as well as statistical power concerns and the yearly nature of the data, only one lag was included in the models. Small-sample degrees-of-freedom adjustment was made when estimating the error variance-covariance matrix, and small-sample *t* and *F* statistics were reported. Besides stationarity and lag significance, models were tested for stability, residual auto-correlation and normally distributed residuals. In addition, sensitivity analyses comparing different models were performed. A *p*-value of 0.05 was set as the cut-off for statistical significance.

The recidivism forecasts are static until the last year of observed data (2013) and dynamic thereafter. For the static forecasts, standard errors were based on the root-mean-square error, and confidence intervals were calculated using *t*-distribution adjusted for the degrees of freedom. For the dynamic forecasts, confidence intervals from bootstrapped residuals were obtained. All analyses were conducted in Stata 15.0.

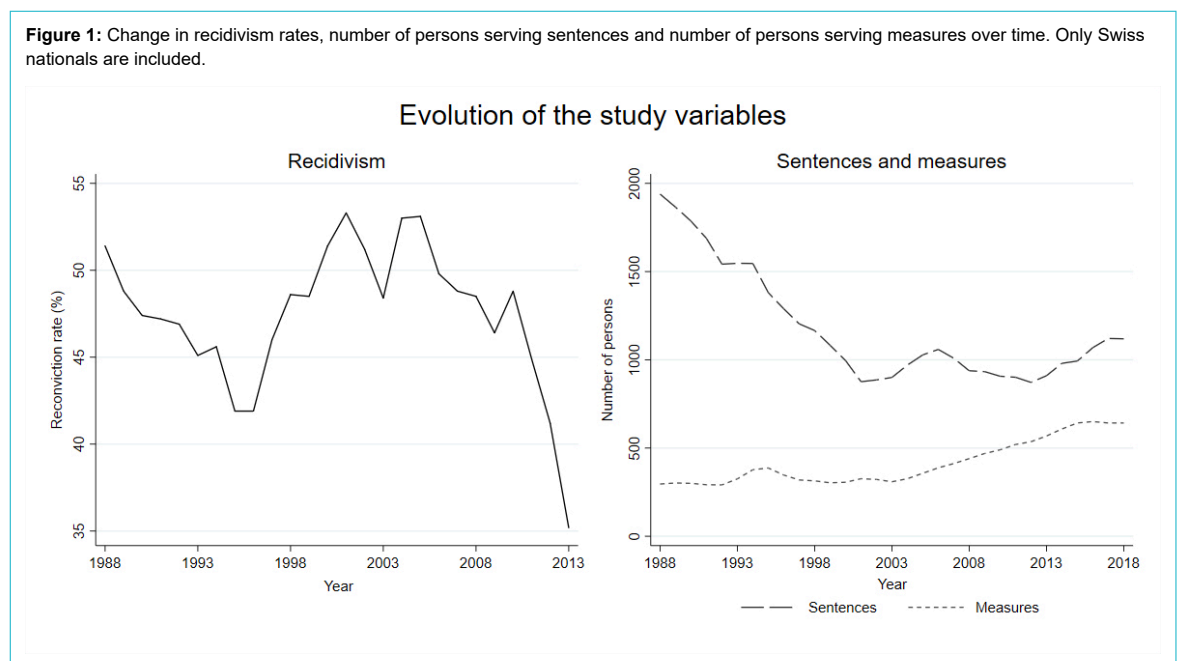
Results

Characteristics of study variables

Figure 1 shows the change in the study variables over time (see also supplementary table S1 in the appendix). Between 1988 and 2013, the mean 3-year reconversion rate was 47.4% (standard deviation [SD] 4.1), and the reconversion rates decreased by 31.5% (from 51.4% in 1988 to 35.2% in 2013) at an average rate of 2.4% per year, corresponding to an absolute drop of 16.2%.

Regarding sanctions, between 1988 and 2018, the average number of persons serving custodial sentences was 1177 (SD 320) per year, ranging from 1939 (in 1988) to 872 (in 2012). During these 30 years, the number of persons serving custodial sentences decreased by 42.3% (from 1939 in 1988 to 1119 in 2018). On the other hand, the average number of persons serving custodial measures was 413 (SD 126) per year, ranging from 291 (in 1992) to 650 (in

Figure 1: Change in recidivism rates, number of persons serving sentences and number of persons serving measures over time. Only Swiss nationals are included.



2016). The number of persons serving custodial measures increased by 116.9% (from 296 in 1988 to 642 in 2018).

Sanctions and recidivism

The regression predicting recidivism through its lagged values and the lagged values of the number of persons serving custodial sentences was not significant as a whole ($F^3 = 0.67$, $p = 0.522$, $R^2 = 0.060$), and the number of persons serving sentences was not associated with the outcome ($p = 0.582$), indicating that sentences had no effect on recidivism.

Table 1 shows the results of the VAR models, with lagged values of recidivism and number of persons serving custodial measures as variables. The equation for reconviction rates was statistically significant ($F^3 = 6.12$, $p = 0.008$) and accounted for 36.8% of the variance. The lagged number of persons serving measures was negatively associated with reconviction rates ($p = 0.003$; $\Delta R^2 = 0.337$), controlling for lagged values of reconviction rates ($p = 0.766$), indicating that an increase in measures was associated with less recidivism. On the other hand, although the equation for persons serving measures was significant ($F^3 = 5.50$, $p = 0.012$, $R^2 = 0.344$), lagged values of reconviction rates were not associated with the number of persons serving measures ($p = 0.407$, $\Delta R^2 = -0.005$), controlling for the lagged values of the number of persons serving measures ($p = 0.003$). This indicated that an increase in the number of persons serving measures resulted in less recidivism, but not vice versa.

Recidivism forecast

Figure 2 displays the observed and forecasted reconviction rates calculated by the VAR model (see also supplementary fig. S2 in the appendix). The predicted rates were close to the observed rates, and all observed values were within the 95% confidence interval (95% CI) of the predictions (except for the year 2013, which was slightly below the lower bound estimate), which showed that the model fits the data well. Based on the forecast, it is likely that recidivism rates will continue to decline from 2014 to 2020, although at a lower rate than that observed after 2005. For the year 2020, a recidivism rate of 27.9% (95% CI 22.6–33.2%) was predicted.

As a sensitivity analysis, we compared the model with one lag to a model with two lags, suggested by lag-order selection statistics as the optimal lag length (however, lag-exclusion statistics indicated that lag 2 was significant in the equation for the number of persons in measures only, and not in the equation for recidivism). The Schwarz's Bayesian information criterion (SBIC) value was slightly lower in the one-lag model (13.68 vs 13.69) indicating that

this model was preferred. Furthermore, the predictions of the two models were almost identical. For the year 2020, the two-lag model predicted a recidivism rate of 27.9% (95% CI 22.7–33.1%). Therefore, for parsimony and statistical power, the model with one lag was used.

Discussion

Based on national data and time series analyses, the present study investigated the trend in criminal recidivism in Switzerland during the last 30 years and the influence of custodial sentences vs custodial measures in reducing re-offending. This research is important for informing correction policies regarding the execution of custodial sanctions [26].

In accordance with our first research hypothesis, the number of persons serving custodial sentences was not associated with recidivism; however, a higher number of persons serving custodial measures was associated with a decrease in recidivism and accounted for about a third of the variance in reconviction rates. Notably, although the number of persons serving measures was associated with recidivism, the converse was not true (i.e., recidivism did not result in a change in the number of persons serving measures). This result indicated that the drop in recidivism is, to a certain extent, related to the higher number of persons serving measures over time. Therefore, it could be argued that, within the dualistic system of criminal sanctions in Switzerland, increased focus on the treatment of dangerous offenders through specialised intervention programmes (measures) could produce better results in terms of reducing reoffending compared with regular prison sanctions (sentences). However, we do not know if the effect on recidivism is due to the efficiency of the measures, or if it is due to an increased number of high-risk offenders serving measures over time and, therefore, receiving court-

Figure 2: Observed and forecasted reconviction rates over time in Switzerland.

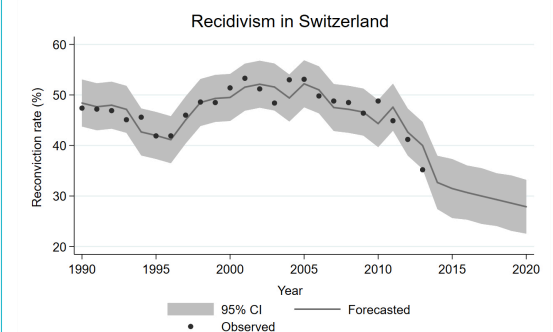


Table 1: Vector autoregressive model.

Equation/covariate	<i>b</i>	SE	95% CI	<i>t</i>	<i>p</i> -value
D.Reconviction rate					
LD.reconviction rate	0.058	0.193	-0.343, 0.459	0.30	0.766
LD.measures	-0.074	0.022	-0.120, -0.028	-3.35	0.003
D.Measures					
LD.reconviction rate	1.362	1.609	-1.984, 4.707	0.85	0.407
LD.measures	0.611	0.184	0.227, 0.994	3.31	0.003

D. = difference, L. = lag, *b* = unstandardised regression coefficient, SE = standard error, 95% CI = 95% confidence interval, *t* = t-test statistic, *p* = significance level. *n* = 24.

ordered treatment, which may have improved recidivism rates.

The association between custodial measures and recidivism could be explained in several ways. First, offenders generally receive more intensive rehabilitation treatments when serving measures than when serving sentences. For each person serving custodial measures, a mandatory individual treatment plan, in conjunction with correctional staff with expertise in diverse areas (e.g., therapists, medical doctors, nurses, social workers and prison guards), is established and systematically revised. Furthermore, treatment programmes include offense-centred therapies targeting criminogenic needs of the offenders. Although such plans may also be available for people serving custodial sentences, the level of therapeutic treatment is generally lower than that for people serving custodial measures. As a result, custodial measures may be more effective in reducing recidivism than custodial sentences [16].

Second, among those serving custodial measures, a greater increase in number over time was observed for persons with severe mental disorders (see fig. S1 in the appendix). This implied that more individuals with mental health problems received treatment during custody. Because mental health issues may be related to reoffending after release [7, 8, 10], the increased resources employed for the treatment of persons with mental disorders serving custodial measures may have played a crucial role in reducing recidivism. However, as the data on the number of persons, separated by nationality, serving specific custodial measures were not available, we were unable to test that theory.

Third, the length of time that offenders spend serving custodial measures has gradually increased. Because the persons serving custodial measures are released only if their therapeutic treatment is considered successful (through annual re-evaluations), the length of stay under these sanctions is not definite, except for the treatment of addictions and measures for young adults. Moreover, the number of persons released from custodial measures has been lower compared with the number of new admissions (see fig. S2 in the appendix), which suggests that the system may have become more restrictive in releasing offenders [27]. Consequently, as offenders spend more time serving measures, their treatment time increases, which may reduce reoffending. Also, longer serving times translate into offenders being released into society at an older age, and age is negatively related to reoffending [8–10], thus lowering recidivism risk.

Fourth, offenders released from custodial measures are generally subjected to longer periods of supervision in the community (with the possibility of prolonged probation periods) than those released from custodial sentences, which can also reduce the likelihood of reoffending [28]. Finally, custodial measures may also prevent recidivism by assessing the most dangerous offenders as permanently untreatable and, therefore, incapacitating them through indefinite incarceration (with the possibility of parole).

In 2013, the observed 3-year reconviction rate in Switzerland was 35%. Compared with the 3-year reconviction rates reported in other German-speaking countries, this value is similar to that of Germany (35% in 2010 [29]) but higher than that in Austria (29% in 2012 [30]). However, it should be noted that recidivism rates are difficult to com-

pare between countries because of the considerable variations in outcome definition and reporting practices [2].

In accordance with our second hypothesis, the results of our analyses indicate that recidivism has declined from 2014 to 2020. An average 3-year reconviction rate of 28% (range 23–33%) was estimated for 2020. This decrease is slower than the considerable drop in recidivism that was observed after 2005. However, considering that the number of persons serving measures stabilised after 2014, a similar pattern may be expected with recidivism. This means that despite the steady decrease in reconviction rates during the last 15 years in Switzerland, the rates may have started to stabilise in the recent past or will in the near future.

Implications

This study has implications for both theory and practice. First, accurate knowledge of baseline recidivism rates can help criminal justice practitioners make better decisions about the assessment and treatment needs of offenders. In 2020, one third or less (23–33%) of the population of Swiss persons released from custodial sanctions are predicted to reoffend. That in mind, information on the threat level of offenders, based on professional judgment and assessment tools (e.g., indicating that the offender is low-, medium-, or high-risk), should be considered in addition to the predicted average likelihood of reoffending (i.e., 28%) when quantifying the risk of an offender (see [31] for more detail on such methods).

Second, the drop in recidivism rates indicates that the criminal justice system in Switzerland has been effective in preventing crime, namely through the use of custodial measures (although not included in this study, the number of foreigners serving custodial measures has been increasing at a higher rate than that of Swiss citizens). This is likely because custodial measures follow the principles of effective correctional treatment, namely the Risk-Needs-Responsivity model [32], thus supporting the idea that such programmes “work” for offender rehabilitation. However, more recently, comparable treatment principles have been implemented for custodial sentences as well.

Third, amongst all the custodial measures, the treatment of mental health issues may be particularly helpful in reducing recidivism. In prison, the prevalence of psychiatric disorders is much higher than in the general community, but the treatment of prisoners with mental health issues is frequently neglected, thus increasing their risk of suicide, self-harm, violence, and victimisation [33, 34]. Therefore, despite higher initial operational costs, accommodating offenders with mental health needs in specialised housing, with access to psychosocial interventions, may help promote their well-being as well as their re-integration into the community, thus reducing costs in the long run [35, 36].

At the theoretical level, our results suggest that the correctional treatment provided by custodial measures, which is primarily based on the principles of rehabilitation (altering offenders’ behaviour) and incapacitation (removing offenders from society), has been more effective in reducing crime in Switzerland compared with custodial sentences. Worldwide, the philosophy and goals of custodial sanctions have changed during the past 50 years [37]. In Switzerland, a higher proportion of offenders has been

serving custodial measures and for a longer period of time, reflecting an increased focus on rehabilitation and crime-control strategies in the 21st century [38].

However, the indeterminate time frame of some custodial measures has drawn criticism. Indeterminate sanctions are considered to be a breach of human rights because prisoners may be kept in custody despite already having served their time, with no knowledge of when they will be released, particularly in the case of indefinite incarceration [39, 40]. Furthermore, clinical decisions about the successful treatment of offenders, which are based on recidivism risk assessments, can be inaccurate [41–43]. Additionally, governments incur extra costs when keeping offenders in custody longer than necessary. Considering the impact that custodial measures can have on a prisoner's life and the criminal justice system, it is important that such measures are used in an optimal manner and not any longer than needed.

Limitations and future directions

The present study has several limitations. The sample size was small for time-series analyses, with only 24 observations available for the VAR model (one observation was lost with differencing and another one was lost with the lag). Because of the small sample size, we did not control for confounding variables in the regression models; therefore, the relationship between custodial measures and recidivism may need further validation with larger sample sizes. Moreover, long-term forecasts, such as that in this study (7 years), tend to have a large margin of error [25]. Additionally, the study population was limited to Swiss nationals only. However, in 2018, about 72% of the custodial population were foreign nationals; therefore, our results cannot be generalised to the entire offender population of the country.

It must be noted that reconviction rates (as defined in this study) are only a proxy measure for recidivism, as not all offenses are considered, recorded or sanctioned [44]. Furthermore, very little is known on desistance rates, time to failure or severity of new offenses, which are all measures of successful rehabilitation [1]. In addition, we could not separate custodial measures into individual sanctions to test the ones that were most associated with the drop in recidivism. Finally, although the number of persons in custodial measures was a significant predictor of recidivism, almost two thirds of the variance remained unexplained, indicating that other factors may play a considerable role in recidivism.

Future research should validate our study's results not only in Switzerland when more recidivism data becomes available, but also in other countries with a similar criminal justice system (e.g., Germany), to increase confidence in the effectiveness of custodial measures. In recent years, Switzerland has been steadily introducing risk reduction programmes as part of custodial sentences; therefore, it is possible that the effects of custodial sentences and measures on recidivism may become comparable in the years to come. Other recidivism outcomes should also be investigated (e.g., re-incarceration) and disaggregated into outcomes related to specific offender populations (e.g., nationality, gender, age, type of crime and criminal history) to provide a more detailed picture of recidivism in the coun-

try. Similarly, the influence of other contextual variables, including correctional practices and programmes, should be tested. Notably, future studies are necessary to determine the appropriate amount of time that offenders need to spend serving custodial sanctions.

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Appendix

Supplementary data

Figure S1: Number of persons in custodial measures by type of measure over time in Switzerland. The entire population in custodial measures (Swiss and foreign nationals) is included.

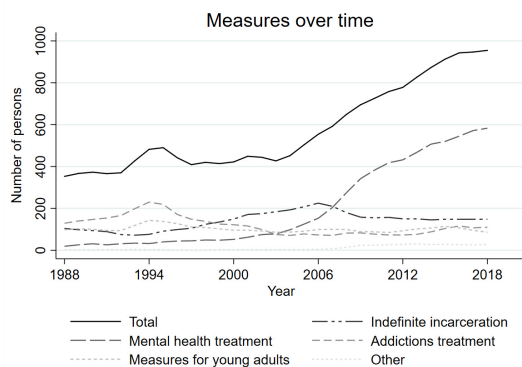


Figure S2: New admissions to and releases from custodial measures over time in Switzerland. Only Swiss citizens are included.

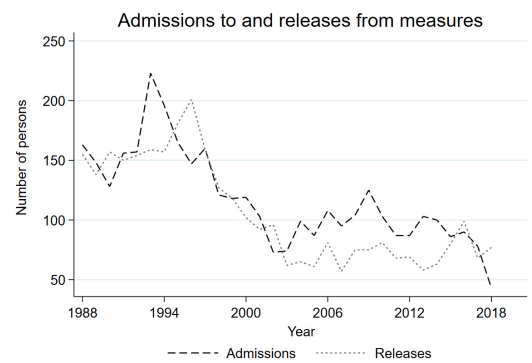


Table S1: Study variables by year^{*}.

Year	Reconviction rate (%)	Number of persons serving sentences	Number of persons serving measures
1988	51.4	1939	296
1989	48.8	1865	302
1990	47.4	1786	300
1991	47.2	1688	292
1992	46.9	1542	291
1993	45.1	1547	325
1994	45.6	1546	377
1995	41.9	1381	387
1996	41.9	1289	347
1997	46.0	1204	319
1998	48.6	1166	314
1999	48.5	1082	303
2000	51.4	996	306
2001	53.3	876	326
2002	51.2	886	322
2003	48.4	900	309
2004	53.0	970	326
2005	53.1	1028	357
2006	49.8	1059	388
2007	48.8	1009	412
2008	48.5	938	440
2009	46.4	933	469
2010	48.8	907	490
2011	44.9	901	520
2012	41.2	872	536
2013	35.2	910	568
2014	–	980	608
2015	–	993	642
2016	–	1069	650
2017	–	1121	642
2018	–	1119	642

* Only Swiss citizens are included.

Table S2: Observed and forecasted recidivism rates.

Year	Observed	Forecasted	95% CI
1988	51.4	–	–
1989	48.8	–	–
1990	47.4	48.4	43.8, 53.1
1991	47.2	47.7	43.0, 52.3
1992	46.9	48.0	43.3, 52.6
1993	45.1	47.2	42.5, 51.8
1994	45.6	42.7	38.0, 47.3
1995	41.9	42.0	37.3, 46.6
1996	41.9	41.1	36.5, 45.8
1997	46.0	45.1	40.4, 49.7
1998	48.6	48.5	43.9, 53.2
1999	48.5	49.3	44.7, 54.0
2000	51.4	49.5	44.9, 54.2
2001	53.3	51.5	46.9, 56.2
2002	51.2	52.1	47.5, 56.8
2003	48.4	51.6	46.9, 56.2
2004	53.0	49.4	44.7, 54.0
2005	53.1	52.2	47.6, 56.9
2006	49.8	51.0	46.4, 55.7
2007	48.8	47.5	42.9, 52.2
2008	48.5	47.2	42.5, 51.8
2009	46.4	46.6	42.0, 51.3
2010	48.8	44.3	39.7, 49.0
2011	44.9	47.6	42.9, 52.2
2012	41.2	42.7	38.0, 47.3
2013	35.2	40.0	35.3, 44.6
2014	–	32.7	27.4, 38.0
2015	–	31.5	25.6, 37.3
2016	–	30.7	25.3, 36.0
2017	–	30.0	24.5, 35.5
2018	–	29.3	24.1, 34.5
2019	–	28.6	23.1, 34.1
2020	–	27.9	22.6, 33.2

95% CI = 95% confidence interval around forecasted recidivism rates derived using the vector autoregressive model.