From Prison to Work: Job Patterns for Women in Chile[†]

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Abstract

Finding and keeping a job is one of the key challenges individuals face as they move back into society. Research suggests that former inmates access mostly jobs on the margins of the labor market, however there is limited research on the dynamics of post-prison employment that account for differences in types of jobs. Using data from the study “Reintegration, desistance and recidivism among female inmates in Chile” (RDFC), our paper describes patterns of employment among a cohort of 207 women released from prison in Santiago, Chile and followed during the first year after release. We use sequence analysis to describe monthly patterns of employment considering different types of work (i.e., self-employed / employed, legitimate / under-the-table). To better account for the complex relationship between work and crime, we include offending as another type of income-generating activity. Finally, we use cluster analysis to explore which individual characteristics are associated with the distinct patterns of employment and offending. Our results show a significant level of heterogeneity in employment trajectories by job type, and the importance of considering work and offending to obtain a more complete picture of the dynamics of employment during reentry.

Introduction

Incarceration alters life trajectories by further restricting the already limited opportunities available for those who end up in prison. With the increase in the number of incarcerated individuals, prison has emerged as a key engine of social inequality (Wakefield & Uggen, 2010; Western, 2007). This process of reproducing and generating inequality is noticeable in the consequences prison has on the labor market outcomes, where the disadvantages ex-inmates carry before imprisonment (e.g., low education, histories of unemployment, health barriers) are enhanced by the stigma associated with a criminal record (Pager, 2003; C. A. Visser et al., 2011). Therefore, finding a job, especially a high-quality one, has proved to be particularly difficult for those returning from prison. Not surprisingly, unemployment at reentry is high (Apel & Sweeten, 2010), and, when jobs are available, they tend to be those on the margins of the labor market (Crutchfield, 2014; Nguyen et al., 2020).

Describing individuals' jobs during reentry provides an insight into the labor market available for former prisoners (Ramakers et al., 2017) and its potential for social integration (Harding et al., 2019). Despite the increasing literature on labor participation at reentry, previous research has mostly analyzed employment as a single, binary phenomenon (employed / not employed), excluding differences in employment characteristics that could be relevant when characterizing labor trajectories after release (Harding et al., 2019; Sugie, 2018; Western et al., 2015). For example, while studies based on administrative data overestimate unemployment by missing informal employment, those who analyze any type of job overlook the heterogeneity behind those patterns as well as possible movements from or toward formality as time goes by. The distinction is important as some types of jobs may not have the same benefits in terms of supporting integration and reducing offending that criminological theory suggests (Nguyen et al., 2020). Moreover, interactions between employment and crime are often overlooked when examining post-release trajectories, notwithstanding evidence suggesting that legal and illegal activities might not be mutually exclusive and can overlap. According to Fagan and Freeman (1999), some offenders, particularly those who are in the margins of the labor market, *double up* in employment and crime. Therefore, analyzing employment trajectories without accounting for offending may provide a limited picture

of the nature of employment after release, and whether and when working can be described as a key turning point in the process of desistance (Laub & Sampson, 2003). Finally, previous research is almost entirely based on male samples, and thus, does not reflect women's reentry experiences. The exclusion from or within the labor market reported in prior studies is intensified among women returning from prison (Morash et al., 1998; Sheely, 2019), as they face a labor market characterized by its gendered inequalities, and experience the double challenge of integrating into conventional life while taking care of others (Berniell et al., 2021; Kalleberg & Vallas, 2017; Leverentz, 2014).

In this paper, we examine employment trajectories among women returning from prison, advancing this area of research in three ways. First, we use a novel and rich longitudinal dataset – the *Reintegration, Desistance, and Recidivism Among Female Inmates in Chile Study* (RDFC) – to describe and characterize women's employment trajectories over the first 12 months after release distinguishing between types of jobs (i.e., self-employed / employed, under-the-table). This allows us to identify specific patterns and employment trajectories not discussed in the previous reentry research. Second, we examine how employment patterns change when considering offending and assess whether there is any overlap between employment and crime. Third, we explore a new and under-studied context (i.e., Latin America) which combines a recent increase in female incarcerated population (Walmsley, 2017) with a labor market where informality is prevalent, particularly for women (Berniell et al., 2021; Tornarolli et al., 2014). Overall, our results provide new evidence about the dynamics of post-prison work trajectories among women, underlining the heterogeneity of job access, as well as the relevance of accounting for offending to better understand the patterns of unemployment.

Employment after prison

The challenges of finding and keeping a gainful employment have been largely emphasized in the reentry literature (Petersilia, 2003; C. A. Visser & Travis, 2003). Formerly incarcerated individuals experience several barriers and difficulties when searching for a job, tied to their deficits in human

and social capital (e.g., low education, limited employment experience) (Bushway & Apel, 2012; Western & Sirois, 2019), as well as the stigma associated with a criminal record (Pager, 2003; Wakefield & Uggen, 2010). These new barriers translate into low rates of employment among the returning population (Harding et al., 2019; Western et al., 2017). C. Visser et al. (2004), for example, report that only 40% of the participants in the *Returning Home* Study were working 30-90 days after release. And while rates tend to increase as months pass, for some groups of the population (i.e., minorities, women), they remain under 50% (La Vigne, 2009; Western et al., 2015; Western & Sirois, 2019).

Two recent studies have expand on prior research, analyzing the dynamics of post-prison employment. Sugie (2018) examines daily patterns of job search and access to employment using data from the Newark Smartphone Reentry Project (NSRP). NSRP followed 133 males on parole during the first three months after release. While most of males searched for a job (92%) or were employed (73%) at least one day during the follow-up, work was largely short lived, sporadic, and diverse, what she describes as *foraging*. Moreover, the data reveal five different trajectories of employment, being an “early exit” from the labor market the most common one. This trajectory show a pattern where job search decreases over time without a corresponding increase in employment. Harding et al. (2019), on the other hand, explore legitimate employment trajectories during three years of a cohort of males and females released in Michigan (Michigan Study of Life After Prison). They identify seven clusters of individuals, from a stable trajectory of no employment (18%) to a trajectory of steady employment (17%). Overall, the results report high levels of instability and over-representation of jobs in the lowest-paying and less stable industries.

Overall, these studies show that former inmates access mostly precarious and highly unstable jobs. While Harding et al. (2019) look only at works that are *on the books*, Sugie (2018) considers any type of legal income-generating activity, including self-employment and *under the table* jobs (see also Western and Sirois, 2019). However, they analyze employment as a binary category (employed/not employed), without examining potential differences in the employment patterns when taking into account characteristics of the job. Expanding and qualifying the definition of

employment will provide a more accurate description of the labor market available to formerly incarcerated individuals. Moreover, to distinguish between types of jobs is relevant given the increase in the informal economy observed in the last decades, and the fact that informal jobs seem not to have benefits of traditional jobs in terms of offending and integration (Nguyen et al., 2020; Sugie, 2018).

Female employment at reentry

While most inmates access precarious and highly unstable jobs, emerging research suggests barriers to reentry might be higher for females than males (Cobbina, 2010). First, incarcerated women have lower education and more significant gaps in their employment histories as well as less access to training and education while in prison (Kruttschnitt & Gartner, 2003; Morash et al., 1998). Second, it is harder for women to find a job as they frequently have to care for others (Leverentz, 2014). Last, there are gender inequalities in the labor market that extend beyond those with criminal records. Compared to men, women are more likely to work in low-paid and precarious jobs, as they are to get less paid in comparable jobs (Kalleberg, 2007). In fact, research shows employment rates among returning females are lower than those of returning males, and do not increase over time. La Vigne (2009), for instance, shows that the rate of employment increases among males (from 48 to 60% over nine months), while the proportion of women working remains stable around 35%. Western et al. (2015) find similar differences: The likelihood of being employed is not only higher for males than females at the second month after release (46% and 27%, respectively), but also increases only among males (to 57%). Women are also slightly over-represented in the no-employment and slow-starters groups reported by Harding et al. (2019). The former could be due to their higher likelihood of being employed in under-the-table jobs, not observed in the data.

Sheely (2019) analyzes the effect of criminal justice contact on employment among women. While she does not describe the patterns of employment after prison, some of the results provide insights on the experience of labor market exclusion (i.e., unemployment) and detachment (i.e.,

being out of the labor force) in this population. In the case of women, arrest and incarceration appear to increase the chances of getting out of the labor force, which could be explained by the prior experiences of rejection and the limited prospects perceived within the formal market. The results are consistent with qualitative studies on female reentry that document how the initial hope placed on work as a critical element to *make it* outside, is faced with frustration and discouragement as they access mostly low-paid, under-the-table, and unstable jobs (Leverentz, 2014; Opsal, 2012).

Previous scholarly work on job trajectories after release from prison is based on all-males (Sugie, 2018) or mostly-male (Harding et al., 2019; Western et al., 2015) samples. As women experience additional challenges in access to formal and high-quality jobs, their patterns of employment at release may well differ from those reported among males. We believe that new insights can be obtained by using an all-female sample to analyze job patterns after release.

Work and crime

Our understanding of the employment patterns at reentry may be better informed when accounting for offending. Until recently, criminologists have tended to analyze crime and legal work as two mutually exclusive behaviors (Fagan & Freeman, 1999). However, studies suggest that offenders *double up* in both legal work and crime (Crutchfield, 2014; Fagan & Freeman, 1999; Hagedorn, 1994; Loughran et al., 2017). As Fagan and Freeman (1999) point out: “rather than dichotomous choice, economic activity for some people seems to vary over a continuum of legal and illegal” (pg. 229). Indeed, the ubiquitous movement between illegal and legal labor market (Loughran et al., 2017) may well explain some of the instability observed in employment at reentry (Sugie, 2018), as individuals search for additional ways to “make ends meet”. Moreover, in line with Crutchfield’s stratification hypothesis (Crutchfield, 2014; Crutchfield & Pitchford, 1997)), the type of jobs formerly incarcerated individuals have access to—less stable and poorly paid—may not offer the commitment and bonds to society associated with better long-term outcomes, such as desistance from crime (Apel & Horney, 2017; Laub & Sampson, 2003). Therefore, the relationship between offending and employment might differ by the type of job available.

The literature that analyzes the effect of employment on recidivism is extensive and, in the case of women returning from prison, mostly mixed (Rodermond et al., 2016; Uggen & Kruttschnitt, 1998). Most of this research, however, does not account for different types of jobs (but see Apel and Horney, 2017; Ramakers et al., 2017). Recently, Nguyen et al. (2020) examine the role of informal and formal work in self-reported offending with a sample of individuals with a history of offending. The authors found no effect of formal or informal job in instrumental crimes, but a positive association between informal jobs and expressive offending. As they discuss, informal employment could be attractive to former offenders, as they experience barriers to formal jobs. The results reinforce the need to broaden the definition of employment to better understand the complexity of the relationship with crime.

The context of the study: Chile

The experience of reentry largely depends on the context to which individuals go back. As Harding et al. (2019) argue, a successful reintegration is a function of the resources those going back bring, and the context of reception. The particularities of the job market and the scope and characteristics of the criminal justice system, would be important determinants of female reentry in Chile.

While female incarceration represents less than 10% of the overall prison population, it has experienced an increase in the last decades in Chile, relatively larger than their males counterparts (Walmsley, 2017). Nearly 50% of all women in prison have been sentenced for drug offenses, and approximately 38% are held for non-violent property crimes (Morales et al., 2016). They come primarily from disadvantaged communities, and are, compared to males, older, less educated and more likely than males to have children (Morales et al., 2016).

In terms of labor market, the limited access to formal employment could be particularly noticeable in a context where informality is prevailing –overall and among women, as it is in Latin America (Tornarolli et al., 2014). While informality represents 18% of all employments in developed countries, it goes up to 70% in developing and emerging economies (REF HERE). In the

case of Chile, the gender-gaps in employment rates and labor conditions have remained despite the increase in female labor market participation experienced in the last decades (Gasparini & Marchionni, 2015). For instance, female participation rose from 33% in 1990 to 47% in 2015, while male participation remained above 70% (International Labour Organization, 2018). Regarding informality, different studies document an informal rate around 40% among female workers (Berniell et al., 2021; Piras & Rucci, 2014; Selamé, 2004), which tend to be slightly larger compared to male workers. This contrasts with the United States, where informal employment represent only 20% of the total jobs, with a marginally larger proportion share among males (International Labour Organization, 2018).

In Chile, the gender gaps in participation and informality are particularly salient among those with lower education (Hermann & Jáuregui, 2019; Piras & Rucci, 2014). For example, in 2017, less than 30% of females without a high-school diploma were working, in contrast to 48% of those with high-school and over 70% of those with terciary education (Hermann & Jáuregui, 2019). Motherhood also increases the chances of unemployment and informality. As Berniell et al. (2021) report, the gender-gap observed in the informality economy in Chile is partially explained by motherhood: women reduce their participation in the formal economy after the birth of their first child, an effect that is concentrated among those with less education and remains over time.

Almost 90% of women released from prison in Chile are mother (Valenzuela et al., 2012), and only 30% have a high-school diploma (Larroulet et al., 2021). They go back, therefore, to a labor market where opportunities may be constrained in terms of the type of jobs available. Moreover, while the existing qualitative work enlighten the type of job formerly incarcerated women may access in the United States (Leverentz, 2014; Opsal, 2012), we do not know about the nature and dynamic of post-prison employment for this population in Chile.¹ It is likely that the size of the informal sector may increase the chance of working among formerly incarcerated women, compared to women release in other developed countries. However, in the same line, formal

¹While there is increasing empirical work on incarceration in Chile and Latin America (e.g., Bergman and Fondevila (2021) and Sanhueza et al. (2019)) and some recent studies on recidivism (Morales et al., 2012; Munyo & Rossi, 2015), to our knowledge, there are not studies analyzing employment at release in Chile.

employment may be particularly hard to find, and be restricted to only those "better off" in terms of education and skills.

We expand previous research by identifying the most common patterns of employment among women release from prison when distinguishing between self-employed, employed, under-the-table and legitimate jobs. Based on prior work, we expect to see that access to a legitimate or formal job will take longer but would eventually lead to more stability in employment. In contrast, self-employment or under-the-table jobs would be more unstable and sporadic. We also expect to see some transitions to formal activities over time. We examine how individual factors such as low education and limited employment experience (Bushway & Apel, 2012), problematic substance use (Western, 2018), a larger offending history (Sheely, 2019) and a younger age (Uggen, 2000), might be related to job trajectories after release. In line with the existing research, we expect to see an association between indicators of "employability" (i.e., work experience, education) and criminal history with more formal trajectories of employment; while those who could experience additional barriers due to criminal records, health, or caregiver responsibilities being more likely to access under-the-table and self-employed jobs. As work and crime seems not to be mutually exclusive, specially in a context of high informality, we also explore the interaction between type of employment and offending (i.e., income-generated crimes). Following Crutchfield (2014), we expect to see a significant overlap between job and crime given how precarious jobs these women access to are. However, we also conjecture that the overlap would depend on the type of job. For instance, we anticipate that employed women being less likely to *double-up* with offending. We finally analyze how socio-demographic characteristics and criminal history relate to job and offending trajectories after release. We expect to see an association between age and criminal history and the trajectories with a higher prevalence of offending.

Data and Methods

Data

We used data from the RDFC, an intensive longitudinal study that followed a cohort of 225 women released from prison in Santiago, Chile, between September 2016 and March 2017.² The target population of the RDFC was Chilean women who served custodial sentences during at least 30 days and were released under parole or after finishing their whole sentence. The goal of the RDFC was to describe the reentry process of women, identifying their needs and the most significant obstacles and challenges they face when returning to society. The study included a baseline questionnaire conducted about two weeks before prison release and four follow-up interviews after release: the first week and after two, six, and twelve months. Questionnaires consisted of mostly closed-ended survey questions covering employment, housing, relationships, and offending. Interviews lasted between one and two hours, and were conducted by trained interviewers.³ The current paper only includes information collected at the baseline and monthly interviews.⁴ The analysis was restricted to those women who participated in at least one follow-up interview (N = 207).⁵

Measures

Employment

We used a life event calendar (LEC) to measure participants' employment status by month (Glasner & van der Vaart, 2009; Roberts & Horney, 2010). Women described their jobs specifying their schedule and contractual conditions so that we could group jobs using four criteria: employed (i.e.,

²The RDFC data have been described in Larroulet et al. (2019) and Daza and Larroulet (2019).

³The questionnaires were developed by the principal investigators, based on three well-known studies conducted in the United States: the Boston Reentry Study (Western et al., 2015), The Returning Home Study (C. Visser et al., 2004), and the Women's Experience of Violence's study (Simpson et al., 2016). We thank their principal investigators for sharing the instruments.

⁴We excluded the first-week interview because the questionnaire did not include comparable questions to the monthly questionnaires.

⁵Eighteen women dropped out between the baseline and the twelve-month interview. These women were younger (average age of 30 years versus 37 of those who remained in the study) and marginally less likely to be previously incarcerated.

receiving payment/salary from someone) or self-employed, legitimate (*on the books* or providing social security benefits) or under-the-table. Thus, we defined four job categories: (1) self-employed under-the-table, (2) self-employed legitimate, (3) employed under-the-table, and (4) employed legitimate. Most of women reported working on *self-employed under-the-table* jobs (21%) over 12 months after release.⁶ These jobs include activities such as selling on the street, open fairs, or parking lots. In contrast, only 2% declared working on *self-employed legitimate* jobs (e.g., selling products at home or driving a taxi, hairdressing, and tailoring). *Employed under-the-table* jobs such as babysitting, housekeeping, and temporary fruit collection represents, in turn, about 10%. The main distinction between these jobs and *self-employed under-the-table* jobs is that the latter do not imply a subordination relationship with other. However, both of them could be defined as *informal* jobs.⁷ Finally, *employed legitimate* positions - cleaners, construction, fast-food, stores, or supermarket workers - reach 9%. Although about 26% of women reported more than one job per month, we selected formal and dependent jobs as the primary ones. We also were able to classify jobs six months before the last arrest using the baseline interview reports. As women also described their jobs previous to the last arrest and specified their schedule and contractual conditions, we created the same job categories described above so that to explore the change over time in the job types.

Offending

Offending was also reported in each interview using monthly calendars and a list of 22 offenses such as theft, burglary, auto theft, robbery, assault, drug dealing, and fraud. We create a binary variable indicating if any crime was committed in a given month. In our analysis, we exclude non-income-generating crimes such as homicide, assaults, and domestic violence.⁸

⁶21% represents the average proportion of time spent working in a position self-employed under-the-table over 12 months after release.

⁷Following the International Labor Organization (ILO) definition, we considered as *informal work* both self-employment and employed activities that were not recognized, regulated, or protected by the laws or regulations of the country; and as *formal work* any job that guarantee those protections (*Decent Work and the Informal Economy*, 2002).

⁸Only 3% of women (6) reported violent crimes 12 months after release.

Covariates

We analyze whether the trajectories of employment and crime differ by a number of demographic and individual covariates measured during the baseline interview. Covariates include age, education attainment (having a high-school diploma), number of children, previous working experience (worked six months prior to the current incarceration term), number of previous sentences, sentence length in months, dependence/abuse of drugs,⁹ and psychological distress¹⁰. We also include two covariates measured during the follow-up interviews to account for selection into the job market: any search for a job and any time in prison 12 months after release.

Analytic strategy

We used sequence analysis to examine employment and crime trajectories 12 months after release. Sequence analysis is a descriptive approach that studies an entire pattern of events over time and focuses on the ordering of different states (Sugie, 2018).¹¹ First, we examined employment trajectories and performed cluster analysis to aggregate similar patterns into distinctive groups.¹² To define the optimal number of clusters, we looked at three quality measures: Average Silhouette width (ASW), Hubert's Gamma (HG), and Point Biserial Correlation (PBC).¹³ We extended this analysis by including employment and offending as co-existing activities, and using cluster analysis to identify distinctive employment-crime trajectories. We characterized the clusters using descriptive tables, discrepancy analysis, and regression tree models with demographic and individual covariates measured during the baseline interview. We accounted for the uncertainty of our estimates using bootstrapped confidence intervals. Missing data in the sequences were imputed using Probabilistic Suffix Trees (Gabadinho & Ritschard, 2016). Overall, thirteen sequences (re-

⁹Measured using the Mini-International Neuropsychiatric Interview (MINI) constructed to evaluate abuse or dependency of drug based on the DSM-IV (Sheehan et al., 1998).

¹⁰Measured using the SCL-90 scale, Mundt et al. 2016

¹¹For details on sequence analysis see Gabadinho et al., 2011; Mills, 2011.

¹²We used the K-Medoids algorithm to define clusters based on Hamming distance of sequences. We also tried different distance metrics to assess how stable were our cluster solution.

¹³Higher values in those quality measures indicate a better cluster solution (i.e., clusters are homogeneous and clearly separated from each other). For more details see Gabadinho et al. (2011).

spondents) contain missing values, and there are 55 missing states. The code of our analysis is available in <https://github.com/sdaza/reentry-work-lifecourse>.

Results

Employment

Overall, 67% of the participants reported working at some point during the first 12 months following release, with an average of five working months. Figure 1 shows the proportion of four job categories over time: (1) self-employed under-the-table, (2) self-employed legitimate, (3) employed under-the-table, and (4) employed legitimate. As the proportion of women who reported no jobs decreases from 70% to 57%, the proportion of working women increases over time, a pattern that is consistent with previous research (La Vigne, 2009; C. Visser et al., 2004; Western et al., 2015).¹⁴ The most common job category is *self-employed under-the-table* – about 20% over the follow-up period. *Employed* positions, in turn, range from 3 to 8%, while *under-the-table* jobs goes from 5% to 10%. *Self-employed legitimate* jobs are rare, with proportions ranging from 1 to 2%. Most of the increase in working women over time is due to *employed* and *under-the-table* jobs. The proportion of women in *self-employed* jobs, on the other hand, is surprisingly stable. Given the low prevalence of *legitimate self-employed* jobs, we combined that category with *legitimate employed* in the subsequent analyses. Thus, all formal jobs remain in the same group.

Table 1 reports the transition rates between job categories.¹⁵ The rates reveal high levels of stability across states. Between any two consecutive months, most of the women remain in the

¹⁴Women might not work due to post-release imprisonment. According to our data, 26% of women were in prison at least once after release. The imprisonment rate by month goes from 2% during the first month to 11% by the end of the follow-up period. On average, women spent 0.77 months in prison. We do not exclude these respondents in our analysis as the proportion of women in prison by month is relatively small, but report the percentage that was incarcerated within each cluster.

¹⁵Transition rates are the probability to switch at any position from state s_i to state s_j . Thus, if $n_t(s_i)$ is the number of sequences with state s_i at position t , and $n_{t,t+1}(s_i, s_j)$, the number of sequences with state s_i at position t and state s_j at position $t + 1$, the transition rate $p(s_j|s_i)$ between states s_i and s_j would be $\frac{\sum_{t=1}^{L-1} n_{t,t+1}(s_i, s_j)}{\sum_{t=1}^{L-1} n_t(s_i)}$, where L is the max observed length (Gabadinho et al., 2011).

same type of job, and movements across different job categories are rare. They do not go higher than 5% (e.g., from *employed under-the-table* to *self-employed*). The most frequent transition is from having a job to not having one.

To better understand the observed stability, we examined the months in each after-release job by the type of job declared six months prior incarceration (Table 2). About half of the women reported being unemployed before imprisonment, and 30% to be self-employed. The stability observed between types of jobs at reentry is partially replicated when analyzing transitions before incarceration. *Formal* and *under-the-table* jobs were more prevalent among those who reported the same kind of jobs six months before imprisonment. Women who were unemployed before going to prison remain mostly unemployed after release. However, while unemployment is significantly higher among those who did not work, our data suggest a general transition toward unemployment. This transition does not seem to depend on the type of job before incarceration. For example, unemployment was the most frequent state at release among those who had a formal job before prison, followed by self-employment. These results are consistent with previous research that points toward a detachment from the labor market as potential consequences of incarceration (Sheely, 2019). It also reinforces the selection process behind incarceration and the limited labor market opportunities available to women who end up in the criminal justice system (Wakefield & Uggen, 2010). Unfortunately, we cannot distinguish between these alternative explanations given the observational nature of our study.

Employment trajectories after releasing from prison

While Figure 1 describes the aggregate employment patterns in the sample, it does not reflect the different individual trajectories that may exist. We used cluster analysis to explore patterns and identify typologies of employment trajectories of the women in our sample. Based on ASW criteria, the best solution for grouping employment trajectories consists of four clusters (see Table S1 in the *Supplemental Material*).

Figure 2 shows the distribution of jobs in four clusters by month. About 59% of the sample

belongs to a cluster where the most likely state is *unemployed*: over 80% of women were unemployed at any month during the follow-up, and on average, they spent ten out of twelve months without a job (see Table 3). As in any cluster analysis, there is variability within clusters. While unemployment is the most likely job status, some women do work at some point, although in sporadic and short-term jobs (see Figure S1 in the *Supplemental Material*). On average, women in this cluster worked about 2 months. Table 3 shows these women have the least working experience, the most severe problems with drugs, and the most extensive criminal history (as reflected by the number of previous sentences and early onset). They also have the highest probability of being in prison during the follow-up period. Moreover, before being released, they expected to have a hard time finding a job, and less than half of them search for a job during reentry. Although this group shows a higher involvement in crime, it would be misleading to associate it exclusively with offending as there might exist unobserved heterogeneity, as we discuss later.

The second largest group (21%) is predominantly *self-employed*. Despite the stability of self-employment observed in Figure 1, there exists heterogeneity within this cluster. Only 20% of women in this cluster kept a self-employed job during the entire follow-up. It is interesting to note though that, compared to the other working clusters, self-employment emerges as an alternative relatively quicker upon release, which may be a consequence of the self-determination that characterize those jobs (see Figure S1 in the *Supplemental Material*). Some women, however, combined though initial periods of unemployment that eventually ended up in self-employment. On average, women in this cluster spent about 2 months unemployed, 41% at the beginning and 5% after 12 months (Figure 2). On the other hand, self-employed positions represent 59% during the first month and 86% at the end of the follow-up, with an average of 9 months (Table 3). Other types of jobs were much less common, confirming the limited movement between job categories. Table 3 shows these women are older (41 years), have more work experience, and later onset of offending compared to the *unemployed* cluster. Still, the number of previous sentences is higher than the other working clusters. Interestingly, the proportion of job searchers is relatively low (39%), suggesting a potential preference for independent jobs, although the estimates are too noisy to reach

firm conclusions.

The two remaining clusters are relatively small. The *under-the-table* cluster represents 11% of the sample. *Under-the-table* jobs increase from 14% to 77% during the follow-up period (Figure 2). The most common trajectory that ends up in *under-the-table* jobs, comes from *unemployment* (see Figure S1 in the Supplemental Material). Although this group is relatively similar to the *self-employed* cluster in age (42 years) and education, they slightly differ in their criminal history and work experience, and report in a higher proportion searching for a job after release. However, the sample size precludes us to reach systematic conclusions.

The final cluster, *formal* (9%) also shows an increase of formal jobs from 16% to 79% over the follow-up period. As expected, the most likely state is *formal* employment (eight months on average). However, unlike what we observed in the *self-employed* cluster, only 5% of women report *formal* jobs during the entire follow-up period. This suggests that women do not jump directly into a *formal* job after release, but it takes a longer time to obtain it. Demographically, the *formal* cluster differs from the others, as women are younger than other working clusters, more educated, less criminally involved, more experienced, and willing to find a job (84%).

Employment and offending

Without considering criminal activity after release, employment trajectories might mask significant variation in the paths women follow during their reentry process. For this reason, we explored patterns of employment after accounting for offending as another possible income-generating activity or *type of job*. To simplify our analysis, we combined all informal jobs on one category: the *self-employment* category was merged with *employed under-the-table* to designate *informal* jobs.

Figure 3 displays the distribution of jobs (formal and informal) and offending over 12 months. The most frequent states are *unemployed* (35%), *informal* jobs (27%), and *crime* (23%). While the proportion of unemployed women decreases (from 44% to 35%), *crime* remains relatively stable around 20% and *informal* work goes up from 22% to 30%. The proportion of women offending and working each month is pretty small (5%), although women who reported offending and work-

ing at any time during the follow-up period reach 21%, 80% of them involved in informal jobs and offending, and 61% in formal positions and crime (not exclusive categories). This suggests that, while *doubling up* in work and offending is as prevalent in our sample as in prior studies,¹⁶ when analyzed within each month, it is sporadic and not a predominant pattern within the employment trajectories. Contrary to our expectations, although *double up* is more likely combined with informal employment, the differences do not emerge as striking.

Including illegal activity in the definition of sequences splits the early *unemployed* category (see Figure 1) into *unemployed* and *offenders* (Figure 3). These results suggest that accounting for offending provides a better characterization of women who are not working, and prevents analysts from mistakenly associating them with criminal involvement (e.g., number of previous sentences).

Table 4 shows transitions between unemployment, working, and offending. Most states are stable and transitions to only crime are infrequent. For example, the probability of moving from unemployment/no-offending to offending is only 5%, while the probability of getting a job is 14%. There is also no transition from only working to offending, and only 3% move from working to having a job and offending. However, among the few women who both work and offend, the most likely transition is into *crime*, and only 11% move to only work. Thus, while working reduces the chances of moving back into crime, consistent with most desistance literature, the overlap between work and crime goes in the opposite direction. In other words, our results suggest that women who are both working and offending are more likely to move towards offending rather than conformity.¹⁷

Employment and crime trajectories after releasing from prison

As for the employment trajectories, based on ASW, we selected four clusters (see Table S3). *Unemployed* remains as the largest cluster (36% of the sample, see Figure 4). On average, women in

¹⁶Loughran et al. (2017), for instance, report that the percentage of individuals that report both work and crime within a year goes from 20 to 30% for ages between 18 and 24. Their study is based on a mostly male, high-risk sample from the United States.

¹⁷The patterns are similar when we distinguished between informal and formal employment, with the only difference being that the chances of transition from a informal-crime state to informal only are larger than the transition rates in the case of formal employments. See Table S2 in the Supplemental Material.

this group spent almost nine months without a job (Table 5), while unemployment increased from 68% to 78% by the end of the follow-up (Figure 4), which could be partially explained by incarceration. Only 16% of this group was unemployed during 12 months, with 39% and 74% reporting either only working or offending at some point in time. This suggests that the cluster is very heterogeneous (see Figure S2 in the *Supplemental Material*). It seems to mix women opting-out from the labor market after trying, women who have never looked for a job during the follow-up, and women who only access to sporadic and short-live positions, and women incapacitated to participate in the labor market due to incarceration. Table 5 also shows that these women are relatively young (37 years), not well educated but with some work experience, had 2.8 previous sentences on average, and 40% are drug dependent. 60% of them report some job search during the follow-up, a percentage that is higher than other clusters.

The second cluster, *offending* (27%), brings together women involved almost exclusively in crime (around 71% over 12 months) and who reported only offending for about 9 months. Just a few of them declared offending and working simultaneously. On the other hand, unemployment increases from 10% to 17%, likely due to incarceration and incapacitation effects. Consistent with their involvement in offending, this cluster is the youngest on average (31 years), has the largest number of previous sentences (8.7) and, compared to other clusters, shows both an earlier onset in offending (77%) and higher drug-dependency (70%). It also includes women with low education (only 11% has a high-school diploma) and almost none work experience – two factors that research strongly relates to unemployment (Bushway & Apel, 2012; Western et al., 2017). Only 27% of them report any job search, and 88% expected difficulties to find a job, indicating little interest in the labor market. Finally, the frequent incarceration terms and short sentences observed in this cluster point to women who *churn* through the justice system, and that, while likely involved in less serious offenses, seem deeply embedded in a criminal lifestyle (Lynch & Sabol, 2001).

The remaining clusters group women likely to be working, either in informal or formal jobs. The *informal* cluster (30%) is characterized by an increasing proportion of informal jobs (from 53% to 79% by the end of the follow-up, with an average of 8.8 months), low criminal activity,

and a moderate co-existence of offending and work at any time (19%). Consistent with the *self-employed* and *under-the-table* clusters discussed in the previous section, women in the *informal* cluster are older (41 years), moderately educated, and with higher work experience. About 48% of them searched for a job during the follow-up, which contrasts with the 59% of unemployed women who report looking for a job. This percentage may indicate a preference for informal employment, although the estimates are still pretty noisy. The *formal* cluster (7%), in turn, consists mostly of women with formal jobs (68% and 8.2 months on average), that increases from 7% to 73% by the end of the follow-up, while unemployment decreases correspondingly from about 70% to 10%. Informal employment, criminal activity, and the combination of offending and working are scant (Table 5). This group consists of women in an *employed* trajectory: late onset and short criminal history (although the longest sentence), and higher work experience and education, which may relate to their higher likelihood of searching for jobs (80%). Both the *informal* and *formal* are pretty similar in their composition, except for differences in education attainment and active job search.

Robustness checks

The reliability of the association between clusters and covariates largely depends on how well we define groups. For robustness, we explored the relationship between sequences and explanatory covariates without prior clustering, using multi-factor discrepancy analysis and regression trees (Studer et al., 2011).¹⁸ All the results are reported in the *Supplemental Material*.

Overall, the results of the discrepancy analysis suggest our covariates explain about 16% of the discrepancies in employment and crime sequences. In both cases, the most relevant variable is work experience, followed by incarceration in the case of employment trajectories, and by the number of previous sentences when sequences include crime. Similarly, the regression trees sug-

¹⁸Although cluster analysis serves for descriptive purposes and the identification of ideal types, it has some of limitations when assessing associations with covariates (Studer et al., 2011; Warren et al., 2015). As clusters are just a simplification of observed sequences, a reliable assessment of covariates would only hold when groups are very homogeneous and clearly separated from each other (i.e., average silhouette width > 0.7). If these assumptions are not met, cluster analysis may hide or create artificial associations with covariates (Studer et al., 2010).

gests that work experience is a key factor to distinguish between trajectories where unemployment is predominant and paths where the probability of having a job is higher. In the employment and crime sequences, having a larger number of prior sentences is what distinguishes between trajectories where offending is more likely and those where work or unemployment prevail. Within those with fewer sentences, those who had been priorly incarcerated reported a path where offending and double-up is more likely. Finally, prior work experience distinguishes between informal and formal employment. Overall, these results are consistent with our descriptive analysis and confirms the relevance of factors such as previous work experience and criminal involvement in explaining employment patterns among formerly-incarcerated women.

Conclusion and Discussion

The first goal of this paper is to identify the most common patterns of employment among women release from prison. We move beyond the dichotomy of employed/unemployed used by prior research (Harding et al., 2019; Sugie, 2018; Western & Sirois, 2019), and distinguish between self-employed, legitimate employed, and under-the-table jobs. We find that a large number of women who declare to work are involved in self-employment, and more specifically, under-the-table self-employment jobs. This result is consistent with prior research noting that ex-inmates usually access to low quality jobs that are at the margins of the labor market (Crutchfield, 2014; Nguyen et al., 2020). As Western (2018) argues, despite the focus on employment as an essential ingredient for reentry and desistance from crime, “a poverty-level income in a minimum-wage job is often a best-case scenario for this population” (p.84). However, as prior studies do either not distinguish between formal and informal jobs (e.g., (Sugie, 2018; Western & Sirois, 2019)), or rely on administrative records where under-the-table is excluded (e.g., Harding et al. 2019), we cannot know whether the high prevalence of under-the-table employment reflected in our data is comparable with studies conducted in contexts. As already stated, the informal economy is a key source of employment in Latin America, which provides access to precarious jobs particularly

to women and urban youths (Tornarolli et al., 2014). It is likely though that with the increase in the informal economy experiences in the United States, former inmates will access mostly self-employed and under-the-table jobs (Nguyen et al., 2020), while remains to be seen how much these changes will vary by gender. In any case, the descriptive results show distinguishing between types of jobs provides a better description to the labor market available to women returning from prison, and helps to better understand the dynamics of employment during the reentry process.

Interesting, we observed a high level of stability in types of employment, with over 80% of the sample remaining in the same type of job between any two consecutive months. Contrary to what we expected, transitions from under-the-table to better jobs – defined as those jobs that provide benefits of some kind – are highly unlikely. Different factors may explain the high stability in the type of job. Age or the need to take care for others may lead women to choose and seek *self-employed* or *under-the-table* jobs, perhaps given the flexibility they offer compared to employed jobs. This selection could also be a consequence of differences in the opportunities provided by the labor market, where the combination of gender and a criminal record would restrict the access to *better* jobs. In fact, only 24% of those who were working six months prior incarceration, report having a formal job, and most of them transition to unemployment and self-employed jobs after release.

Our results also show heterogeneity in employment patterns, even within a disadvantaged group of women returning from prison. Specifically, we identify four very distinct groups with different employment experiences, trajectories, and individual characteristics. Again, these groups barely mix job types, which suggests women may select into specific jobs. Moreover, some of the characteristics of the informal clusters (*self-employed* and *under-the-table*) relate to the hypothesis of preferences toward informality (i.e., older, higher number of children, lower probability of search), while others point to additional barriers tied to their criminal records or low education. The *formal* group, in turn, just brings together those women with better prospects to obtain a good job: younger with low criminal involvement, with higher human capital in terms of education and work experience. Unfortunately, we lack data to identify which factors are behind the employment se-

lection process, and examine how the labor market, individual preferences, and job opportunities define observed employment trajectories. We leave this goal for future research.

The second goal of this paper is to assess how relevant accounting for offending is when describing employment patterns at reentry. While offending is often analyzed as an outcome in studies of employment at reentry (Ramakers et al., 2017) and research on desistance from crime (Laub & Sampson, 2003), the few studies that describe patterns of employment at reentry do not account for offending as another way to make ends meet (Harding et al., 2019; Sugie, 2018; Western et al., 2015). As Western and Sirois (2019) hypothesize, ongoing criminal involvement could be closely associated with unemployment. However, when including offending as a state in the employment trajectories, we identify a new cluster characterized by women largely involved in crime. More interestingly, this offender group was previously confounded with unemployed women, despite the fact that they differ in a number of individual characteristics. Excluding illegal activities when exploring employment trajectories would indeed have masked critical heterogeneity in the different paths women might follow at reentry. The new *unemployed* group concentrates those women who might experience larger entry barriers in the labor market. These women may be stigmatized because of their criminal record, as indicated by a larger number of prior sentences these women have compared to the working clusters, or experience additional barriers given their lack of human and social capital (e.g., lower education and work experience than the working clusters). In some cases, their health problems (e.g., drug abuse) may push them out of the labor market, as reflected by the 40% who did not search for jobs. How do women in this group make ends meet without working?

Prior research shows family networks may act as a key source of support during reentry (Harding et al., 2014; Mowen & Visser, 2015; Western et al., 2015). La Vigne (2009), for instance, report that 65% of ex-inmates rely on family for money eight months after release. Western et al. (2015) also find that women are more likely to receive support from family than men. Thus, family support may free individuals from working in the first place. Understanding the role of these factors on unemployment would help to distinguish among women motivated to work but unable

to overcome existing barriers, and those who decided to remain out of the labor force.

This group contrasts with the *offender* cluster, consisting of women possibly less interested in working, as reflected by the low percentage of job searches during the follow-up, or who experience additional barriers associated their drug abuse and low work experience. Characterizing these two groups better may shed light into the role of motivation to change when analyzing the nature of employment after incarceration. This is aligned with research on correctional programming suggesting internal change would be a “pre-requisite” to make opportunity-based programs successful in preventing re-offending (MacKenzie, 2006; Nakamura & Bucklen, 2014). Thus, to avoid the consequences of unobserved heterogeneity, we recommend future studies to include offending when exploring sequences of employment among ex-inmates.

Our analyses suggest reinforcing selection processes where criminal involvement, education, and work experience might generate systematic and distinct employment trajectories among women returning from prison. Distinguishing between types of jobs, once more, brings additional information that may be informative when discussing employment programs for this population.

Finally, we find some level of *doubling up* in working and crime among females returning from prison. However, while working at some point decreases the chance of offending in the following month, *doubling up* increases the probability of only offending more than working exclusively. This result contradicts prior research suggesting that being involved in work and crime may act as a transition toward conformity (Loughran et al., 2017). Also, contrary to our expectations, we find no clear connection between *doubling up* and job type.

This paper is not without limitations. First, we only observe one year after release and use monthly based reports. Looking at longer periods of time or shorter time-lags (e.g., daily reports) might change our trajectories. Second, while we move beyond the employment/unemployment dichotomy, we analyze only one job per month. When two different categories of jobs were reported, we kept the one with higher quality (i.e., legitimate employed job). We recognize that the statuses generated are not mutually exclusive. Consistently with the idea of “foraging” developed by Sugie (2018), a woman may be working multiple jobs, even in different categories, as it does

26% in our sample. Thus, we may be overestimating the access to legitimate and employed jobs, but also the level of stability as we are not accounting for changes in jobs within categories. Third, we relied on self-reported information for either employment and crime. This can distort some of trajectories we find as offending may be under-reported, particularly among the unemployed sample. Finally, this paper contributes to the existing work analyzing an under-studied context with an under-studied population. Women face structural inequalities when participating in the labor market, and additional barriers related to their role as primary caregivers. These factors might determine gender differences in the types of jobs a former incarcerated woman can access, however, we lack data to test this hypothesis. Moreover, informal jobs are particularly common in Latin America, and concentrate among females. As most of the research has been conducted with only or mostly-male samples and in the United States and United Kingdom (e.g. Sugie 2018), we cannot know whether the patterns and differences observed are due to gender or the context that defines which jobs individuals can access.

Overall, this paper helps understand employment trajectories at reentry by using detail information from a sample of women moving out of prison. While we confirm prior research findings on the precariousness of jobs former inmates can access (Harding et al., 2019; Sugie, 2018), we extend this area of research by analyzing different types of jobs and accounting for offending as another income-generating activity. Overall, our results show a significant level of heterogeneity and persistence in employment trajectories by job type, and the importance of considering work and offending to obtain a more complete picture of job transitions among former inmates.

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Tables

Table 1: Transition rates between job categories of women inmates during the first 12 months following their release ($N = 207 \times 12$)

	None	Self-employed	Under-the-table	Formal
None	0.90 (0.88, 0.92)	0.05 (0.03, 0.06)	0.03 (0.02, 0.04)	0.03 (0.02, 0.04)
Self-employed	0.10 (0.07, 0.12)	0.85 (0.81, 0.88)	0.03 (0.01, 0.04)	0.03 (0.01, 0.05)
Under-the-table	0.13 (0.09, 0.18)	0.05 (0.02, 0.08)	0.80 (0.74, 0.85)	0.03 (0.01, 0.05)
Formal	0.13 (0.09, 0.19)	0.03 (0.01, 0.05)	0.03 (0.01, 0.05)	0.81 (0.75, 0.87)

Probability to switch at a given position from state s_i to state s_j .
95% bootstrapped confidence intervals in parenthesis (1000 samples).

Table 2: Months in after-release jobs by occupation declared 6 months before incarceration

Job after release	Total (N=207)	Job 6 months before incarceration			
		None (N=105)	Self-employed (N=62)	Under-the-table (N=16)	Formal (N=24)
None	6.99 (6.38, 7.60)	9.19 (8.40, 9.94)	4.90 (3.86, 5.88)	5.32 (3.56, 7.19)	4.08 (2.80, 5.50)
Self-employed	2.57 (2.08, 3.13)	1.28 (0.74, 1.85)	4.64 (3.62, 5.70)	1.75 (0.75, 2.94)	3.66 (2.13, 5.23)
Under-the-table	1.20 (0.88, 1.56)	0.92 (0.53, 1.37)	1.16 (0.57, 1.82)	3.17 (1.50, 4.75)	1.27 (0.47, 2.30)
Formal	1.24 (0.89, 1.58)	0.61 (0.28, 1.01)	1.31 (0.70, 2.04)	1.76 (0.56, 3.19)	2.99 (1.67, 4.37)

95% bootstrapped confidence intervals in parenthesis (1000 samples).

Table 3: Covariates by job cluster

	Cluster				
	Total (N=207)	Unemployed (N=122)	Self-employed (N=44)	Under-the-table (N=22)	Formal (N=19)
Time spent on job (months)					
None	7.00 (6.36, 7.65)	10.39 (9.98, 10.80)	1.89 (1.43, 2.39)	2.54 (1.73, 3.45)	2.17 (1.47, 2.95)
Self-employed	2.57 (2.05, 3.08)	0.66 (0.40, 0.93)	9.13 (8.55, 9.73)	1.65 (0.86, 2.36)	0.73 (0.21, 1.32)
Under-the-table	1.20 (0.86, 1.57)	0.46 (0.26, 0.67)	0.34 (0.11, 0.59)	7.22 (6.36, 8.18)	1.02 (0.26, 1.90)
Formal	1.23 (0.88, 1.60)	0.49 (0.27, 0.76)	0.63 (0.20, 1.11)	0.59 (0.18, 1.05)	8.08 (7.05, 9.11)
Covariates (average)*					
Age*	36.7 (35.3, 38.3)	34.2 (32.4, 36.2)	41.1 (38.3, 44.3)	42.0 (37.6, 46.5)	35.9 (30.9, 41.5)
High school*	0.30 (0.24, 0.36)	0.23 (0.16, 0.30)	0.34 (0.20, 0.48)	0.32 (0.14, 0.55)	0.63 (0.42, 0.84)
Num. of children	2.55 (2.30, 2.81)	2.34 (2.02, 2.65)	3.07 (2.50, 3.71)	2.77 (1.95, 3.73)	2.37 (1.74, 3.00)
Dependence / drug abuse*	0.39 (0.32, 0.46)	0.52 (0.42, 0.61)	0.18 (0.07, 0.30)	0.32 (0.14, 0.50)	0.16 (0.00, 0.32)
Crime before age 15*	0.49 (0.42, 0.56)	0.60 (0.51, 0.69)	0.28 (0.14, 0.42)	0.38 (0.19, 0.62)	0.37 (0.16, 0.58)
Num. previous sentences*	3.98 (3.01, 5.18)	5.03 (3.74, 6.78)	3.12 (1.60, 5.70)	2.09 (1.00, 4.05)	1.00 (0.47, 1.68)
Sentence length*	2.19 (1.84, 2.56)	1.86 (1.42, 2.34)	1.94 (1.42, 2.48)	3.06 (1.80, 4.73)	3.79 (2.27, 5.32)
Worked before prison*	0.49 (0.43, 0.56)	0.33 (0.25, 0.42)	0.75 (0.61, 0.86)	0.59 (0.41, 0.82)	0.84 (0.68, 1.00)
Expected hardness of finding job*	0.69 (0.63, 0.76)	0.82 (0.74, 0.89)	0.46 (0.29, 0.61)	0.62 (0.38, 0.81)	0.50 (0.28, 0.72)
Searched jobs during follow-up*	0.49 (0.42, 0.56)	0.46 (0.37, 0.55)	0.39 (0.25, 0.52)	0.55 (0.32, 0.77)	0.84 (0.68, 1.00)
Prison during follow-up*	0.26 (0.20, 0.31)	0.39 (0.30, 0.47)	0.07 (0.00, 0.16)	0.05 (0.00, 0.14)	0.11 (0.00, 0.26)

* Statistically significant differences across clusters (p-value < 0.05). 95% bootstrapped confidence intervals in parenthesis (1000 samples).

Table 4: Transition rates between having any job and crime of women inmates during the first 12 months following their release ($N = 207 \times 12$)

	None	Crime	Job	Job-Crime
None	0.80 (0.77, 0.83)	0.05 (0.04, 0.07)	0.14 (0.11, 0.17)	0.00 (0.00, 0.01)
Crime	0.11 (0.09, 0.14)	0.86 (0.83, 0.89)	0.00 (0.00, 0.00)	0.03 (0.01, 0.04)
Job	0.09 (0.07, 0.12)	0.00 (0.00, 0.01)	0.87 (0.85, 0.90)	0.03 (0.02, 0.04)
Job-Crime	0.04 (0.01, 0.07)	0.21 (0.14, 0.30)	0.11 (0.05, 0.18)	0.64 (0.52, 0.73)

Probability to switch at a given position from state s_i to state s_j .

95% bootstrapped confidence intervals in parenthesis (1000 samples).

Table 5: Covariates by job-crime cluster

		Cluster			
	Total (N=207)	Unemployed (N=74)	Offenders (N=56)	Informal (N=62)	Formal (N=15)
Time spent on job (months)					
None	4.27 (3.79, 4.80)	8.70 (8.19, 9.23)	1.72 (1.27, 2.16)	1.87 (1.47, 2.29)	2.11 (1.27, 3.00)
Crime	2.76 (2.24, 3.35)	1.12 (0.70, 1.55)	8.57 (7.82, 9.38)	0.11 (0.02, 0.24)	0.07 (0.00, 0.20)
Informal	3.26 (2.73, 3.82)	1.33 (0.92, 1.80)	0.29 (0.12, 0.46)	8.78 (8.24, 9.36)	1.07 (0.47, 1.80)
Informal-Crime	0.47 (0.28, 0.69)	0.32 (0.08, 0.62)	0.85 (0.32, 1.46)	0.39 (0.13, 0.68)	0.00 (0.00, 0.00)
Formal	1.08 (0.76, 1.44)	0.52 (0.24, 0.85)	0.18 (0.02, 0.43)	0.84 (0.45, 1.27)	8.16 (6.80, 9.33)
Formal-Crime	0.16 (0.07, 0.28)	0.01 (0.00, 0.04)	0.40 (0.12, 0.73)	0.02 (0.00, 0.05)	0.59 (0.00, 1.60)
Covariates (average)*					
Age*	36.7 (35.2, 38.2)	36.5 (34.1, 39.2)	31.4 (29.3, 33.4)	41.4 (38.7, 44.2)	38.1 (32.4, 44.7)
High school*	0.30 (0.24, 0.36)	0.30 (0.20, 0.41)	0.11 (0.04, 0.20)	0.39 (0.27, 0.52)	0.67 (0.47, 0.87)
Num. of children	2.54 (2.29, 2.81)	2.50 (2.09, 2.92)	2.32 (1.89, 2.80)	2.85 (2.35, 3.42)	2.27 (1.53, 3.00)
Dependence / drug abuse*	0.39 (0.33, 0.46)	0.39 (0.30, 0.50)	0.70 (0.59, 0.80)	0.18 (0.08, 0.27)	0.13 (0.00, 0.33)
Crime before age 15*	0.49 (0.42, 0.56)	0.44 (0.33, 0.56)	0.77 (0.64, 0.88)	0.33 (0.22, 0.45)	0.27 (0.07, 0.47)
Num. previous sentences*	4.03 (3.09, 5.16)	2.82 (1.92, 3.92)	8.71 (5.89, 12.16)	1.72 (1.11, 2.64)	1.13 (0.53, 1.87)
Sentence length*	2.20 (1.83, 2.61)	2.52 (1.86, 3.16)	0.85 (0.47, 1.33)	2.46 (1.85, 3.14)	4.54 (2.72, 6.35)
Worked before prison*	0.49 (0.42, 0.56)	0.42 (0.31, 0.53)	0.23 (0.12, 0.34)	0.74 (0.63, 0.84)	0.80 (0.60, 1.00)
Expected hardness of finding job*	0.69 (0.63, 0.76)	0.76 (0.67, 0.86)	0.88 (0.78, 0.96)	0.48 (0.36, 0.60)	0.50 (0.21, 0.79)
Searched jobs during follow-up*	0.49 (0.42, 0.56)	0.59 (0.49, 0.70)	0.27 (0.16, 0.39)	0.48 (0.35, 0.60)	0.80 (0.60, 1.00)
Prison during follow-up*	0.26 (0.20, 0.31)	0.27 (0.16, 0.38)	0.54 (0.41, 0.66)	0.03 (0.00, 0.08)	0.07 (0.00, 0.20)

* Statistically significant differences across clusters (p-value < 0.05). 95% bootstrapped confidence intervals in parenthesis (1000 samples).

Figures

Figure 1: Distribution of job categories by month of women inmates during the first 12 months following their release (N = 207)

U = Under-the-table

Figure 2: Distribution of job categories of women inmates during the first 12 months following their release by four employment clusters (N = 207)
(U = Under-the-table)

Figure 3: Distribution of job categories and crime of women inmates during the first 12 months following their release by four employment clusters (N = 207)
 U = Under-the-table

Figure 4: Distribution of job categories and crime of women inmates during the first 12 months following their release by four employment-crime clusters (N = 207)

Supplemental Material

The code to reproduce the analysis of the paper *From Prison to Work: Job Patterns for Women in Chile* is available in repository <https://github.com/sdaza/reentry-work-lifecourse>.

Employment

Table S1 shows three cluster quality measures of job clusters: Average Silhouette width (ASW), Hubert's Gamma (HG), and Point Biserial Correlation (PBC). Higher values in those quality measures indicate a better cluster solution (i.e., clusters are homogeneous and clearly separated from each other). For more details see Gabadinho et al. (2011). Figure S1, on the other hand, shows the sequences of job types during the first 12 months after release by job cluster.

Table S1: Employment quality measures for cluster solutions (N = 207)

	ASW	HG	PBC
2 clusters	0.45	0.75	0.59
3 clusters	0.50	0.88	0.74
4 clusters	0.55	0.96	0.82
5 clusters	0.51	0.96	0.83
6 clusters	0.50	0.96	0.83

ASW = Average Silhouette width, HG = Hubert's Gamma, PBC = Point Biserial Correlation.

Figure S1: Sequences of job categories of women inmates during the first 12 months following their release by four employment clusters (N = 207)
(U = Under-the-table, L = Legitimate)

Employment and crime

Table S2 shows transition rates between states when we distinguished between informal and formal employment. Table S3, on the other hand, shows the three cluster quality measures of job-crime clusters mentioned above. Finally, Figure S2 shows the sequences of job types and crime during the first 12 months after release by cluster.

Table S2: Transition rates between job-crime categories of women inmates during the first 12 months following their release ($N = 207 \times 12$)

	None	Crime	Informal	Informal-Crime	Formal	Formal-Crime
None	0.80 (0.77, 0.83)	0.05 (0.04, 0.07)	0.11 (0.08, 0.13)	0.00 (0.00, 0.01)	0.04 (0.02, 0.06)	0.00 (0.00, 0.00)
Crime	0.12 (0.09, 0.15)	0.86 (0.82, 0.89)	0.00 (0.00, 0.00)	0.02 (0.01, 0.03)	0.00 (0.00, 0.00)	0.01 (0.00, 0.02)
Informal	0.09 (0.07, 0.11)	0.00 (0.00, 0.01)	0.85 (0.82, 0.88)	0.03 (0.01, 0.04)	0.03 (0.02, 0.05)	0.00 (0.00, 0.00)
Informal-Crime	0.03 (0.00, 0.07)	0.17 (0.10, 0.25)	0.14 (0.07, 0.23)	0.65 (0.53, 0.75)	0.00 (0.00, 0.00)	0.01 (0.00, 0.03)
Formal	0.11 (0.06, 0.16)	0.00 (0.00, 0.00)	0.05 (0.03, 0.09)	0.00 (0.00, 0.00)	0.80 (0.73, 0.86)	0.03 (0.01, 0.06)
Formal-Crime	0.03 (0.00, 0.13)	0.29 (0.17, 0.42)	0.00 (0.00, 0.00)	0.07 (0.00, 0.21)	0.04 (0.00, 0.13)	0.57 (0.36, 0.72)

Probability to switch at a given position from state s_i to state s_j .
95% bootstrapped confidence intervals in parenthesis (1000 samples).

Table S3: Employment and crime quality measures for cluster solutions ($N = 207$)

	ASW	HG	PBC
2 clusters	0.28	0.57	0.44
3 clusters	0.36	0.80	0.65
4 clusters	0.40	0.88	0.72
5 clusters	0.35	0.87	0.70
6 clusters	0.31	0.87	0.68

ASW = Average Silhouette width, HG = Hubert's Gamma, PBC = Point Biserial Correlation.

Figure S2: Sequences job-crime categories of women inmates during the first 12 months following their release by four employment-crime clusters (N = 207)

Discrepancy analysis and regression tree

As a robustness check, we used both multi-factor discrepancy analysis and regression tree to assess the relative important of different covariates on women's job sequences without using cluster analysis. We first used multi-factor discrepancy analysis to examine which covariates better explain the discrepancies of employment and crime trajectories without using cluster analysis. The discrepancy of sequences is defined as pairwise dissimilarities between sequences. The multi-factor approach allow us to know which effects are relevant and significant, but does not tell us much about what the effects are (i.e., about how trajectories may change with the value of the covariates).¹⁹ Tables S4 and S5 shows F-statistics, R^2 s, and p-values for a set of covariates. Overall, our covariates explain about 16% of the discrepancies in employment and crime sequences. In both cases, the most relevant variable is work experience, followed by incarceration in the case of employment trajectories, and by the number of previous sentences when sequences include crime. The results are consistent with our descriptive analysis.

Second, we estimated regression trees to examine how sequences change with the values of covariates and account for interaction effects. Figure S3 shows the dissimilarity tree of our employment sequences. The overall R^2 value of the tree is 13%. Figure S3 suggests that work experience is a key factor to distinguish between trajectories where unemployment is predominant and paths where the probability of having a job is higher. In the employment and crime sequences (Figure S4), having a larger number of prior sentences is what distinguishes between trajectories where offending is more likely and those where work or unemployment prevail. Within those with fewer than four prior sentences, those who had not been incarcerated reported a path where informal work is more likely, and, consistently, prior work distinguishes between informal and formal employment. Our regression tree analysis, thus, provides a richer picture on how individual covariates are associated with employment and criminal trajectories, and confirms the relevance of factors such as previous work experience, criminal involvement, and age.

¹⁹For more details see Studer et al. (2011).

Table S4: Multi-factor discrepancy analysis for job sequences (N = 204)

Covariate	Pseudo F	Pseudo R^2	p-value
Worked before prison	8.89	0.04	0.00
Prison during follow-up	2.62	0.01	0.01
Age	1.68	0.01	0.09
Dependence / abuse of drugs	1.65	0.01	0.08
High school	1.60	0.01	0.11
Sentence length in months	1.15	0.00	0.30
Number of previous sentences	0.83	0.00	0.55
Number of children	0.81	0.00	0.56
Total	4.47	0.16	0.00

Estimation based on Hamming distances of sequences.

Figure S3: Regression Tree job categories of women inmates during the first 12 months following their release (N = 207)

Table S5: Multi-factor discrepancy analysis for job and crime sequences (N = 204)

Covariate	Pseudo F	Pseudo R^2	p-value
Worked before prison	5.01	0.02	0.00
Number of previous sentences	3.79	0.02	0.00
Prison during follow-up	3.34	0.01	0.00
Age	1.98	0.01	0.03
Dependence / abuse of drugs	1.94	0.01	0.04
High school	1.41	0.01	0.15
Sentence length in months	1.38	0.01	0.17
Number of children	0.64	0.00	0.82
Total	4.69	0.16	0.00

Estimation based on Hamming distances of sequences.

Figure S4: Regression Tree job categories and crime of women inmates during the first 12 months following their release (N = 207)

References

- Gabadinho, A., Ritschard, G., Studer, M., & Müller, N. S. (2011). Analyzing and Visualizing State Sequences in R with TraMineR. *Journal of Statistical Software*, 40(i04), 1–37.
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