Refuge and Resistance: Mission Stations, Outside Options, and the Coercion of Khoe Labour in the Cape Colony*

Calumet Links† Lisa Martin‡ Dieter von Fintel§

March 2, 2026

Abstract

The indigenous Khoe of the Cape Colony occupied a unique position in the political economy of coerced labour: legally free yet bound to settler farms by pass laws, vagrancy ordinances, and the destruction of their independent pastoral livelihood. This paper asks whether Protestant mission stations—established in staggered fashion across the Colony between 1792 and 1843—provided the Khoe with credible outside options that reshaped the colonial labour market. Using 194,003 farm-year observations from the *opgaafrol* (tax census) spanning five districts over nearly seven decades (1775–1844), we implement a difference-in-differences event-study framework that leverages variation in the timing and geographic proximity of mission establishment. We find that mission proximity increased Khoe employment on nearby farms by approximately 1.4 workers per farm, consistent with missions functioning as Khoe population centres that expanded the local indigenous labour supply. Slaveholding, by contrast, showed no immediate response—precisely because slaves, as chattel property, could not exercise outside options. The decisive result emerges from the interaction with Ordinance 50 of 1828, which abolished the Khoe pass system: only after this reform did mission proximity reduce slave reliance (by 0.47 slaves per farm) while further increasing Khoe employment (by 0.84 workers). This finding demonstrates that the outside option was specifically a *Khoe* phenomenon—dormant under the pass regime that immobilised them, and activated only when the institutional barrier to Khoe mobility

*This paper would not have been written without the transcription efforts of Linda Orlando and Chris de Wit, and the kind support of Erika le Roux at the Cape Archives. More information about the Cape of Good Hope Panel project is available at: www.capepanel.org. We thank Sheilagh Ogilvie, Anne Carlos, Igor Martins, Heinrich Nel, Auke Rijpma, Robert Ross and participants at WEHC 2025 for their valuable input. All errors remain those of the authors.

†LEAP, Department of Economics, Stellenbosch University.

‡LEAP, Department of Economics, Stellenbosch University.

§LEAP, Department of Economics, Stellenbosch University.

was removed. The contrast between the responsive Khoe margin and the inert slave margin provides a clean test of the Acemoglu and Wolitzky (2011) outside-options framework: coerced workers can only discipline employers when exit is credible, and for the Khoe, mission stations made exit credible.

Keywords: Khoe labour coercion, outside options, mission stations, Cape Colony, pass laws, Ordinance 50, difference-in-differences

JEL Classification: N37, J47, O13

1 Introduction

Among the many forms of coerced labour that characterised the early modern colonial world, the subjugation of the indigenous Khoe at the Cape of Good Hope was distinctive. Unlike enslaved persons—who were imported as chattel, bought and sold as property, and whose legal status left no ambiguity about their unfreedom—the Khoe were nominally free subjects under Dutch and later British law. In practice, however, a web of pass laws, vagrancy ordinances, and apprenticeship regulations bound them to settler farms with nearly the same rigidity as slavery (Elphick and Giliomee, 1979; Dooling, 2005; Penn, 2005). The Khoe occupied the ambiguous borderland between slavery and freedom: too "free" to be traded as commodities, yet too constrained to leave. It is precisely this ambiguity that makes the Khoe case analytically valuable for understanding how outside options shape coerced labour markets.

Standard models of labour coercion predict that the equilibrium level of coercion depends on the alternatives available to workers (Acemoglu and Wolitzky, 2011). Where outside options are absent, the coercive employer extracts effort at low cost; where credible alternatives exist, the threat of exit constrains coercion and shifts the equilibrium toward better conditions or voluntary labour supply. This theoretical insight is well established, but direct empirical tests remain scarce. The fundamental challenge is finding plausibly exogenous variation in outside options for a population that is otherwise constrained.

This paper exploits such variation. Between 1792 and 1843, Protestant mission stations were established in staggered fashion across the Cape Colony, providing the Khoe with a material and institutional alternative to servitude on settler farms. Missions offered food, shelter, land for cultivation, spiritual community, and—critically—legal advocacy. For a Khoe worker bound to a settler farm under the pass system, a nearby mission station represented the nearest thing to an exit option: a place where one might find refuge, sustenance, and the intervention of a missionary willing to challenge settler authority in colonial courts.

We combine the timing and location of 30 mission station establishments with 194,003 farm-year observations from the *opgaafrol* (Dutch East India Company and British colonial tax census) spanning five districts over nearly seven decades (1775–1844). Our difference-in-differences event-study framework leverages both the staggered timing of establishment and the geographic proximity of farms to missions. The identification strategy relies on the fact that, conditional on sub-district and year fixed effects, mission placement was determined by government land grants, missionary-society logistics, and proximity to existing Khoe communities—not by the agricultural productivity or labour composition of neighbouring settler farms (Kruger, 1966; Elbourne, 2002).

Our central findings tell a coherent story about Khoe outside options. First, the establishment of a mission station within 100 km increases Khoe employment on nearby farms by approximately 1.4 workers—an effect that is statistically significant at the 1% level, economically large (68% of the sample mean), and robust to alternative distance thresholds, placebo tests, and event-study pre-trend checks. This is consistent with missions functioning as Khoe population centres: they attracted Khoe individuals who then entered the surrounding farm labour market on more favourable terms.

Second, slaveholding shows no statistically significant immediate response to mission establishment. This null result is not a weakness—it is a prediction. Enslaved persons were chattel property. They could not exercise an outside option because they could not leave. The outside-options mechanism operates through the *Khoe* margin, and the slave null confirms that our estimates are capturing a Khoe-specific channel rather than a generic labour market shock.

Third—and most strikingly—the interaction with Ordinance 50 of 1828 reveals that the full force of the outside option was activated only when the Khoe pass system was abolished. After 1828, mission proximity reduces total slaves by 0.47 per farm ($p < 0.05$) and the slave share of the labour force by 0.11 ($p < 0.05$), while simultaneously increasing Khoe workers by 0.84 ($p < 0.10$). Before 1828, the pass system rendered the mission a theoretical but not practical refuge: the Khoe could not legally leave their employer's farm without documentation, and absconding carried severe penalties. Ordinance 50 transformed the mission from a distant promise into a credible threat. This two-stage pattern—outside options existing but dormant under the pass regime, then activated by legal reform—provides a uniquely clean test of the theoretical prediction that outside options require complementary institutions to become effective.

This paper contributes to several literatures. First, we engage with the economics of labour coercion. The Nieboer-Domar hypothesis attributes coercion to high land-to-labour ratios in frontier economies (Nieboer, 1900; Domar, 1970; Galenson, 1984). Acemoglu and Wolitzky (2011) formalise the role of outside options in disciplining coercive employers, while empirical work has examined serfdom in Bohemia (Klein and Ogilvie, 2017), Russia (Markevich and Zhuravskaya, 2018), and contract enforcement in industrial Britain (Naidu and Yuchtman, 2013). We contribute the first micro-level evidence from a colonial indigenous labour system in which the coerced population was nominally free, making the outside-options mechanism particularly transparent.

Second, we extend the growing literature on the economic effects of missionary activity in sub-Saharan Africa (Becker and Meier zu Selhausen, 2023; Harries, 2001; Meier zu Selhausen, 2014). While missionaries have been credited with promoting literacy, human capital, and political mobilisation, less attention has been paid to their role in disrupting local labour coercion. We argue that mission stations at the Cape

anticipated the emancipatory effects of later labour reforms by providing the Khoe with an institutional foothold outside the settler economy.

Third, we contribute to Cape Colony economic history. Previous work using the *opgaafrol* has examined settler fertility (Cilliers and Mariotti, 2019), income inequality (Fourie and Von Fintel, 2011), and slave productivity (Du Plessis et al., 2015). An earlier version of this study, focused exclusively on the frontier districts of Graaff-Reinet and Tulbagh, found that reduced coercion (through the 1809 Hottentot Proclamation) led to lower Khoe effort—interpreted as evidence that, without outside options, loosening coercion simply reduces worker effort (Fourie and Green, 2015). The present analysis, covering the full Colony, reveals that where outside options *did* exist—near mission stations—the effect of liberalisation was the opposite: Khoe workers were drawn into the farm economy on better terms, and slave reliance declined.

The remainder of the paper is structured as follows. Section 2 develops a formal theoretical framework—adapting the Acemoglu and Wolitzky (2011) model to a two-worker-type setting with asymmetric outside options—and derives four testable propositions. Section 3 provides the historical background on Khoe coercion and the role of mission stations as Khoe refuges. Section 4 describes the data. Section 5 presents the empirical strategy. Section 6 reports the results. Section 7 discusses the findings and their implications.

2 Theoretical Framework

We adapt the model of labour coercion developed by Acemoglu and Wolitzky (2011) to the specific institutional environment of the Cape Colony, where two coerced labour populations—enslaved persons and indigenous Khoe—coexisted under fundamentally different constraints. The key extension is that outside options are *type-specific*: they depend on the worker's legal status, the availability of a physical refuge, and the institutional regime governing mobility.

2.1 Setup

Consider a settler-farmer (the principal) who operates a farm using two types of coerced labour: Khoe workers and slaves. The farmer's production function is

$$Y = f(a_K L_K,\ a_S L_S,\ X) \tag{1}$$

where L_j is the number of type-j workers employed ($j \in \{K, S\}$), $a_j \in [0, 1]$ is the effort exerted by type-j workers, and X represents land, livestock, and other fixed factors. We assume f is increasing and concave in both labour inputs, and that Khoe and slave

labour are *imperfect substitutes*: $f_{KS} > 0$, so that the marginal product of each type is increasing in the other, but one can partially replace the other.[1]

Each worker of type j has an outside option $\bar{u}_j$—the utility attainable by leaving the current employer. Following Acemoglu and Wolitzky, the farmer can invest in coercion ("guns") $g_j \geq 0$ at cost $\eta_j \chi(g_j)$, where $\chi(\cdot)$ is convex and increasing, to reduce the effective outside option of each worker type. The worker's participation constraint binds at the coercion-adjusted outside option:

$$\bar{u}_j^{\text{eff}} = \bar{u}_j - g_j \tag{2}$$

The central insight of Acemoglu and Wolitzky (2011) is that the principal's objective is *supermodular* in $(a_j, g_j, -\bar{u}_j)$: lower outside options induce more coercion and more effort in equilibrium, and the three are complements. The equilibrium level of coercion for each type satisfies the first-order condition

$$\eta_j \chi'(g_j^*) = \frac{\partial \pi}{\partial g_j} = a_j^* \cdot \frac{\partial f}{\partial (a_j L_j)} \cdot L_j \cdot \frac{\partial a_j^*}{\partial g_j} \tag{3}$$

equating the marginal cost of coercion to its marginal benefit through increased effort extraction.

2.2 Asymmetric outside options: Khoe versus slaves

The two coerced populations at the Cape differ fundamentally in the structure of their outside options:

Enslaved persons. Slaves were chattel property. Their legal status meant that exit from employment was not a contractual choice but a criminal act (absconding), carrying severe punishment and near-certain recapture. Formally, we set

$$\bar{u}_S = 0 \tag{4}$$

The slave's outside option is zero regardless of geography, institutional reform, or the availability of mission stations. A mission 50 km away offers no practical refuge to a person who can be recaptured, returned, and punished as stolen property (Fogel and Engerman, 1974; Barzel, 1977). For slaves, effort is governed entirely by the farmer's coercive technology—monitoring, punishment, and the threat of sale—not by outside options.

[1] This assumption is appropriate to the Cape context: Khoe workers specialised in herding and pastoral tasks while slaves were concentrated in arable agriculture, but substitution occurred at the margin, particularly in the diversified farming operations of the southwestern Cape.

Khoe workers. The Khoe were legally free but institutionally constrained. Their outside option depends on two variables: the *availability* of a credible destination and the *institutional freedom* to reach it. Let m_i denote the proximity of farm i to the nearest mission station, and let $\lambda_t \in \{0, 1\}$ indicate the institutional regime:

$$\lambda_t = \begin{cases} 0 & \text{if the pass system is active (before 1828)} \\ 1 & \text{if Ordinance 50 has abolished the pass system (1828 onward)} \end{cases}$$

The Khoe outside option is:

$$\bar{u}_K(m_i, \lambda_t) = \underbrace{\bar{u}_0}_{\substack{\text{baseline} \\ \text{(destitution)}}} + \underbrace{\varphi(m_i)}_{\substack{\text{mission} \\ \text{proximity}}} \cdot \underbrace{(1 - \theta + \theta\lambda_t)}_{\substack{\text{institutional} \\ \text{access}}} \tag{5}$$

where:

- $\bar{u}_0 \geq 0$ is the baseline Khoe outside option in the absence of missions, reflecting the near-destitution of a Khoe population stripped of its pastoral livelihood;
- $\varphi(m_i) > 0$ is the value of having a mission station nearby, with $\varphi'(m_i) > 0$ (increasing in proximity) and $\varphi(0) = 0$ (no value if no mission exists);
- $\theta \in (0, 1]$ parameterises how much the pass system constrains access to the mission refuge: when $\lambda_t = 0$ (pass system active), the effective mission premium is $\varphi(m_i)(1 - \theta)$—the mission exists but is only partially accessible. When $\lambda_t = 1$ (Ordinance 50), the full premium $\varphi(m_i)$ is realised.

The parameter θ captures the key institutional friction: before 1828, a Khoe worker required documentation to leave a settler's farm; absconding without a pass risked arrest and forced re-assignment. The mission was a theoretical but not fully practical refuge. After 1828, the institutional barrier was removed, and the mission became a credible threat of exit.

2.3 The settler's optimisation problem

The farmer chooses the labour mix (L_K, L_S) and coercion levels (g_K, g_S) to maximise profits:

$$\max_{L_K, L_S, g_K, g_S} \; f\big(a_K^*(g_K, \bar{u}_K) \cdot L_K,\; a_S^*(g_S, \bar{u}_S) \cdot L_S,\; X\big) - w_K L_K - w_S L_S - \sum_j \eta_j \chi(g_j) \tag{6}$$

where w_j denotes the cost of employing a type-j worker (for slaves, the annualised cost of purchase, maintenance, and depreciation; for Khoe, the in-kind or cash wage) and $a_j^*(g_j, \bar{u}_j)$ is the equilibrium effort function derived from the worker's incentive compatibility and participation constraints.

From the Acemoglu and Wolitzky supermodularity result, equilibrium effort is increasing in coercion and decreasing in the outside option:

$$\frac{\partial a_j^*}{\partial g_j} > 0, \qquad \frac{\partial a_j^*}{\partial \bar{u}_j} < 0 \tag{7}$$

The farmer's optimal coercion of each type depends on that type's outside option through the complementarity of $(a_j, g_j, -\bar{u}_j)$:

$$\frac{\partial g_j^*}{\partial \bar{u}_j} < 0 \tag{8}$$

Better outside options reduce coercion. The farmer's optimal labour allocation equates the marginal product of each type to its effective cost, inclusive of coercion expenditure.

2.4 Predictions

The model generates four testable predictions that distinguish the Khoe outside-options channel from alternative explanations.

Proposition 1 (Khoe labour responds to missions)**.** *An increase in mission proximity m_i raises the Khoe outside option $\bar{u}_K$, which:*

(a) reduces optimal coercion of Khoe workers: $\partial g_K^*/\partial m_i < 0$;

(b) alters Khoe employment on farms: $\partial L_K^*/\partial m_i \neq 0$.

The sign of the employment effect in (b) is ambiguous ex ante*. The direct effect of a higher outside option—reduced coercion and lower extracted effort—tends to reduce farm demand for Khoe labour. However, missions also function as Khoe population centres that expand the local labour supply, creating an indirect positive effect. The net sign is an empirical question.*

Proof. Part (a) follows directly from equation (8) and the fact that $\partial \bar{u}_K/\partial m_i = \varphi'(m_i)(1 - \theta + \theta\lambda_t) > 0$. Part (b) is the standard ambiguity in the Acemoglu and Wolitzky (2011) framework: the farmer substitutes toward or away from the type whose outside option has improved, depending on the relative magnitudes of the effort reduction and the labour supply expansion. □

Proposition 2 (Slave outcomes do not respond to missions)**.** *Since $\bar{u}_S = 0$ is invariant to mission proximity m_i, we have*

$$\frac{\partial g_S^*}{\partial m_i} = 0, \qquad \frac{\partial L_S^*}{\partial m_i} = 0$$

Slave coercion and slave employment do not respond directly *to mission establishment. Any*

observed effect on slaves must emerge indirectly, through equilibrium reallocation of the labour mix, and only when complementary institutional changes activate the Khoe outside option.

Proof. Since $\bar{u}_S$ does not depend on m_i (equation 4), the first-order conditions for g_S^* and L_S^* are unaffected by changes in mission proximity. □

Proposition 2 is the paper's key falsification test. If our estimates were capturing a generic labour-demand shock (e.g., missions increase agricultural demand), *both* labour types would respond. The prediction that only the Khoe margin responds identifies the mechanism as operating through outside options, not through demand.

Proposition 3 (Ordinance 50 activates the Khoe outside option)**.** *The cross-derivative of the Khoe outside option with respect to mission proximity and institutional regime is strictly positive:*

$$\frac{\partial^2 \bar{u}_K}{\partial m_i \, \partial \lambda_t} = \theta \, \varphi'(m_i) > 0 \tag{9}$$

Consequently, the effect of mission proximity on Khoe coercion and labour outcomes is amplified after the abolition of the pass system:

$$\left| \frac{\partial g_K^*}{\partial m_i} \right|_{\lambda=1} > \left| \frac{\partial g_K^*}{\partial m_i} \right|_{\lambda=0}$$

Moreover, the institutional reform induces an indirect effect on slave *employment near missions. When the Khoe outside option is activated ($\lambda_t = 1$, m_i high), the farmer's optimal labour mix shifts toward the now freely available Khoe labour and away from expensive slave capital:*

$$\frac{\partial^2 L_S^*}{\partial m_i \, \partial \lambda_t} < 0 \tag{10}$$

This slave decline is not because slaves gain an outside option—they do not. It is because the activated Khoe outside option alters the relative cost of the two labour types, inducing equilibrium substitution.

Proof. Equation (9) follows by differentiating equation (5). The amplification of the coercion response follows from the supermodularity of the farmer's objective in $(g_K, -\bar{u}_K)$: a larger increase in $\bar{u}_K$ (when $\lambda_t = 1$) induces a larger reduction in g_K^*. The slave substitution in equation (10) follows from the farmer's labour allocation optimality condition: when the effective cost of Khoe labour falls (because reduced coercion lowers effort extraction, but the expanded Khoe labour supply more than compensates), the farmer's optimal mix shifts toward Khoe and away from slaves, whose cost (purchase price, maintenance) is unaffected by the reform. □

Proposition 4 (Heterogeneity across missionary societies)**.** *If missionary societies differ in the quality of the outside option they provide—that is, if $\varphi(m_i)$ varies by society σ,*

with $\varphi_{Moravian}(m_i) > \varphi_{LMS}(m_i) > \varphi_{Other}(m_i)$—then the Khoe labour response is ranked accordingly. Societies that invested more heavily in Khoe community infrastructure, material support, and legal advocacy created stronger outside options and produced larger equilibrium effects.

Proof. A higher φ_σ increases $\bar{u}_K$ for a given m_i, which by the comparative statics in equations (8)–(7) produces a larger response in g_K^*, a_K^*, and L_K^*. □

2.5 Mission stations as Khoe outside options: the channels

The function $\varphi(m_i)$ in equation (5) captures several concrete channels through which missions raised the Khoe outside option:

1. **Material refuge.** Missions provided food, shelter, and access to land, reducing the destitution that would otherwise follow a Khoe worker's departure from a settler farm. The destruction of independent Khoe pastoral communities had left many Khoe with no alternative to farm service; missions partially restored that alternative.
2. **Reconstituted community.** Colonial expansion had shattered Khoe kinship networks and kraals (Penn, 2005). Missions offered a social structure that replaced the destroyed indigenous communities, providing the collective support necessary for individual resistance to coercion.
3. **Legal advocacy.** Missionaries—particularly those of the London Missionary Society—intervened on behalf of mistreated Khoe workers, providing access to colonial courts that individual Khoe could not otherwise navigate (Elbourne, 2002). The infamous "Black Circuit" proceedings of 1812, initiated by LMS missionaries, directly challenged settler abuse of Khoe labourers.
4. **Information and signalling.** The mere existence of a nearby mission signalled to Khoe workers that alternatives existed, even before they acted upon them. This information effect could shift the bargaining position of Khoe workers *in situ*, without requiring actual departure.

Crucially, these channels apply specifically to the Khoe, not to slaves. Slaves could not access mission refuge without committing a capital offence (absconding); they could not invoke missionary legal advocacy without their owner's permission; and information about alternatives was irrelevant to a person with no legal right to move. The outside-options story is inherently and exclusively a story about the Khoe.

3 Historical Background

3.1 The Khoe under colonial rule

The Khoe—the indigenous Khoikhoi pastoralists of the southwestern Cape—were the first non-European population encountered by Dutch colonists after the establishment of the Cape settlement in 1652. Unlike the enslaved populations imported from Southeast Asia, Madagascar, and the Indian Ocean littoral, the Khoe were indigenous inhabitants with their own pastoral economy, social organisation, and territorial claims (Elphick and Giliomee, 1979).

The colonial encounter was catastrophic. A series of Dutch-Khoe wars in the seventeenth century, combined with the devastating smallpox epidemics of 1713 and 1755, destroyed the independent Khoe pastoral economy (Penn, 2005). Deprived of their cattle, their grazing lands appropriated by expanding settler farms, and their communities shattered, the Khoe were progressively absorbed into the colonial economy as dependent labourers. By the late eighteenth century, the majority of Khoe in the settled districts had no independent means of subsistence and worked on settler farms under conditions that differed from slavery primarily in their formal legal classification (Dooling, 2005).

3.2 The coercive regime: passes, vagrancy, and the *inboekenstelsel*

The institutional apparatus of Khoe coercion was codified through a series of legislative acts:

The *inboekenstelsel* (1787). This pass system required Khoe to register with local magistrates and carry documentation specifying their place of residence and employer. Without a pass, a Khoe individual was deemed a vagrant and could be compelled to enter the service of any settler who claimed them (Delius and Trapido, 1982). The system was designed to immobilise Khoe labour: a Khoe worker could not leave one farm for another without official documentation, and obtaining such documentation required the cooperation of the very employer from whom the worker wished to depart.

Apprenticeship ordinances. Governor van Plettenberg's 1775 ordinance bound children of Khoe mothers and slave fathers (*Bastaard-Hottentotten*) to settler households until the age of 25, creating a captive labour force from birth (Malherbe, 1978). The *inboekenstelsel* extended this logic: Khoe children born on a settler's farm could be "registered" (*ingeboekt*) as apprentices, binding them to the household for their formative years.

The Hottentot Proclamation (1809). When the British assumed permanent control of the Cape in 1806, the Earl of Caledon sought to formalise the master-servant relationship. The resulting Proclamation of 1809 codified both settler obligations (to provide food, clothing, and reasonable treatment) and Khoe restrictions. Crucially, it *reinforced* the pass system, requiring every Khoe individual to have a "fixed place of abode" registered with the local *landdrost*. The Proclamation was framed as humanitarian reform—protecting the Khoe from abuse—but its practical effect was to tighten the binding of Khoe workers to settler farms (Dooling, 2005).

Cradock's Code (1812). Governor Cradock's supplementary regulations extended the apprenticeship system and imposed fines on Khoe found without passes, further constricting Khoe mobility.

This coercive architecture operated asymmetrically relative to slavery. Slaves were bound by their legal status as property; the Khoe were bound by administrative regulation. The distinction mattered: because the Khoe's constraint was institutional rather than ontological, institutional changes—such as the establishment of a nearby mission station or the repeal of the pass laws—could directly alter their effective outside option. For slaves, no institutional change short of manumission or abolition could create an outside option.

3.3 Ordinance 50 (1828): the liberation of Khoe mobility

Ordinance 50 of 1828 was the single most important institutional change for the Khoe during our sample period. It abolished all legal distinctions between the Khoe and European colonists, repealing the pass system, the vagrancy provisions, and the apprenticeship regulations that had constrained Khoe mobility for half a century. For the first time, a Khoe worker could legally leave a settler's employ without documentation, seek alternative employment, or take up residence at a mission station without facing criminal sanction.

The timing of Ordinance 50 is central to our identification strategy. If mission stations function as Khoe outside options, their effect should be latent before 1828—because the pass system prevented the Khoe from accessing the option—and activated after 1828, when the institutional barrier to Khoe exit was removed. This is precisely what we find.

3.4 The slave system: a distinct institution

The Cape Colony's slave system operated in parallel with Khoe coercion but through fundamentally different mechanisms. Approximately 63,000 slaves were imported be-

tween 1652 and 1808, primarily from Southeast Asia, Madagascar, Mozambique, and the Indian Ocean islands (Shell, 1994; Worden, 1996; Schoeman, 2007). Slaves were concentrated in the wine and wheat districts of the southwestern Cape (Stellenbosch, the Cape district), where they formed the backbone of the agricultural labour force.

Two features distinguish the slave system from Khoe coercion for our purposes. First, slaves were capital assets: they were bought, sold, inherited, and mortgaged. Their value depended on their productivity and the cost of replacement, not on their outside options (which were effectively zero). Second, the 1807 British abolition of the Atlantic slave trade closed the external supply of enslaved labour, making existing slave stocks more valuable but not altering the fundamental constraint that prevented slaves from exercising outside options.

Because slaves could not access mission stations without absconding (a capital offence), and because their legal status as property made exit conceptually impossible, we treat slave outcomes as a *falsification test* for the outside-options mechanism. If our estimates are truly capturing a Khoe-specific outside-options channel, slave outcomes should not respond directly to mission establishment. They should respond only *indirectly*—through equilibrium substitution—and only after Ordinance 50 made the Khoe outside option operational.

3.5 Mission stations as Khoe institutions

Protestant missionary activity at the Cape began with the Moravian Church's establishment of Genadendal in 1738 (re-established 1792 after a hiatus). The London Missionary Society (LMS) followed with Bethelsdorp (1803), and the Rhenish Missionary Society, the South African Missionary Society, the Wesleyan Methodists, and the Glasgow Missionary Society established additional stations throughout the first half of the nineteenth century.

The missions' relationship with the colonial labour system was deeply contentious—and the contention centred squarely on the Khoe. Settlers viewed mission stations as magnets for "runaway Hottentots" who would otherwise work on their farms (Elbourne, 2002). The LMS missionaries Johannes van der Kemp and James Read were particularly notorious for their confrontational advocacy on behalf of Khoe workers, culminating in the "Black Circuit" court proceedings of 1812 that brought settler abuses of the Khoe to public trial (Dooling, 2005). The Moravians adopted a more conciliatory stance but nonetheless provided the Khoe with artisanal training, agricultural instruction, and—above all—a community outside the settler labour system.

The mission stations were, in essence, *Khoe institutions*. They served the Khoe; they were resented by settlers because they drew Khoe labour; and the political controversies surrounding them were almost entirely about the Khoe labour supply. Slaves

occasionally found refuge at missions, but this was marginal: the overwhelming function of mission stations in the Cape colonial economy was to provide an alternative to Khoe servitude on settler farms.

The spatial diffusion of mission stations across the Colony was staggered over several decades, with different societies establishing stations at different times and in different locations (Figure 1). This staggered rollout provides the identifying variation for our empirical strategy.

4 Data

4.1 The *opgaafrol* (tax census)

Our primary data source is the Cape Colony *opgaafrol*—a household-level tax census conducted annually by colonial officials. The dataset comprises 194,003 farm-year observations spanning five administrative districts from 1775 to 1844: Stellenbosch (96,430 obs., 1775–1844), Graaff-Reinet (42,354 obs., 1787–1828), Swellendam (24,010 obs., 1806–1826), Tulbagh (16,158 obs., 1805–1822), and the Cape district (15,051 obs., 1800–1825).

Each observation records the household's labour force—including the number of enslaved persons (by gender and age), Khoe workers, and European settlers—as well as livestock holdings (cattle, sheep, horses), crop production (wheat, wine), and productive assets. The critical feature for our purposes is the separate enumeration of Khoe workers and enslaved persons, which allows us to study how mission proximity differentially affects these two coerced populations.

Table 1 provides summary statistics. The mean farm employed 2.97 slaves and 2.01 Khoe workers, but these averages mask enormous heterogeneity: the median farm had zero Khoe workers (reflecting both frontier farms without Khoe and arable farms relying entirely on slaves), while the maximum reached 970 (reflecting large pastoral operations in Graaff-Reinet).

The five districts exhibit stark differences in economic structure and, crucially, in the relative importance of Khoe versus slave labour (Table 2). Stellenbosch and the Cape district specialised in wine and wheat production using predominantly slave labour (mean slaves per farm: 3.4–3.9; mean Khoe: 0.9–1.0). Graaff-Reinet, the pastoral heartland, relied heavily on Khoe herding labour (mean Khoe: 3.9; mean slaves: 1.1). Swellendam practised mixed agriculture, and Tulbagh combined vine cultivation with stock farming.

This geographic heterogeneity in Khoe versus slave reliance provides a powerful within-Colony contrast. The districts where Khoe labour was most important (Graaff-Reinet, Swellendam) are precisely those where the outside-options mechanism should

Table 1: Summary Statistics

Variable	*N*	Mean	Std Dev	Median	Min	Max
Total slaves	193,686	2.97	6.87	0	0	199
Total Khoe workers	146,883	2.01	6.39	0	0	970
Slave share of labour	162,688	0.97	3.25	0	0	176
Khoe share of labour	116,426	0.27	1.52	0	0	399
Total labour force	162,792	4.99	6.25	3	1	304
Cattle	193,741	24.28	48.82	6	0	2,813
Sheep	193,734	169.93	470.74	0	0	30,000
Horses	193,769	7.19	16.96	1	0	1,866
Wheat harvested (muids)	194,003	30.10	1,647	0	0	454,075
Wine (leaguers)	194,003	4.89	196.05	0	0	50,875

Notes: Farm-year observations from the Cape Colony *opgaafrol*, 1775–1844. Slave and Khoe counts sum male, female, and child categories. Wheat is measured in Cape muids (≈109 litres). Wine in Cape leaguers (≈576 litres).

Table 2: District Characteristics

District	*N*	Years	Slaves	Khoe	Cattle	Sheep	Wheat	Wine	Treated
Stellenbosch	96,430	1775–1844	3.9	0.9	15.8	62.5	15.0	5.5	77.9%
Graaff-Reinet	42,354	1787–1828	1.1	3.9	44.7	495.4	5.4	0.1	14.3%
Swellendam	24,010	1806–1826	1.9	2.0	27.0	66.4	17.8	0.4	84.6%
Tulbagh	16,158	1805–1822	3.3	3.4	29.1	260.6	104.0	19.7	0.0%
Cape	15,051	1800–1825	3.4	1.0	11.9	9.1	137.1	5.5	77.1%

Notes: Column means for key variables. "Treated" is the share of farm-year observations for which a mission station exists within 100 km. Mean distance to nearest mission: Stellenbosch 47 km, Swellendam 63 km, Cape 65 km, Tulbagh 214 km, Graaff-Reinet 224 km.

have the most direct bite on the Khoe labour supply, while the slave-intensive districts (Stellenbosch, Cape) offer the sharpest test of whether the mechanism operates through the slave margin as well.

4.2 Mission station data

We compile a georeferenced dataset of 30 mission stations established in or near the Cape Colony before 1850, drawing on Kruger (1966), Elbourne (2002), Sales (1975), the Frescura database, and South African History Online records. Of these, 16 fall within *opgaafrol* districts and 14 lie outside but are included for distance calculations, since farms on district borders could be within range of external missions.

The stations are operated by six missionary societies: the Moravian Church (9 stations, from 1792), the London Missionary Society (8 stations, from 1802), the Rhenish Missionary Society (6, from 1817), the South African Missionary Society (2), the Wesleyan Methodists (2), and the Glasgow Missionary Society (1). Figure 1 displays the staggered timeline of establishment within the *opgaafrol* districts.

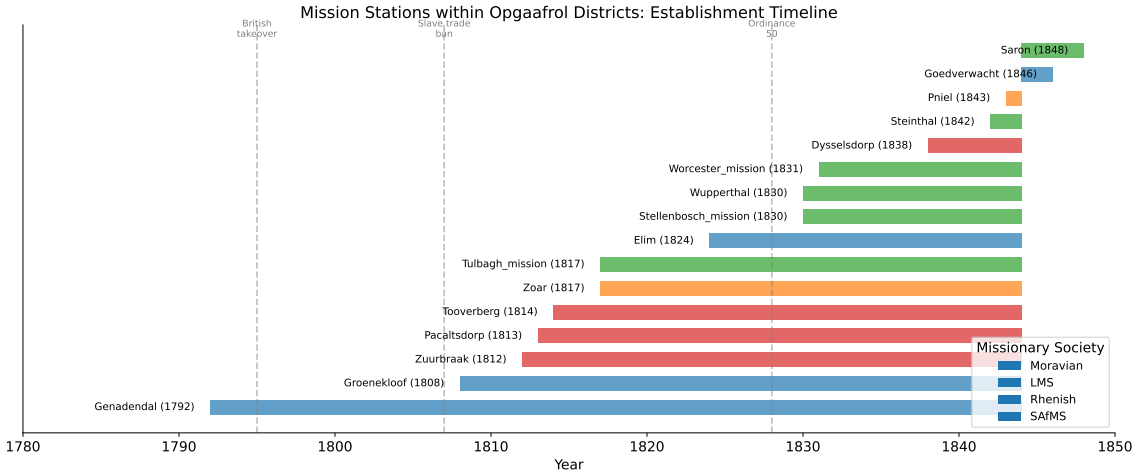

Figure 1: Timeline of Mission Station Establishment within *Opgaafrol* Districts

Notes: Horizontal bars show the period from establishment to the end of the sample (1844). Vertical dashed lines mark key institutional events affecting the Khoe: the 1809 Hottentot Proclamation, the 1812 Cradock Code, and the 1828 Ordinance 50. Colour indicates missionary society. Genadendal (Moravian, 1792) is the earliest station within the sample area.

4.3 Treatment construction

For each farm observation, we assign a sub-district identifier using the fieldcornetcy recorded in the *opgaafrol* (available for Graaff-Reinet and Swellendam) or the district centroid from the 1825 Cape Colony shapefile (for Stellenbosch, Tulbagh, and Cape, where sub-district information is absent). We then compute the haversine distance

from each sub-district to each of the 30 mission stations and track which missions exist at each point in time. This produces time-varying treatment measures:

- $\text{Post}_{st} = \mathbb{1}[\text{nearest mission within 100 km exists at time } t]$;
- Dist_{st}: distance (km) to the nearest existing mission at time t;
- YearsSince_{st}: years since the nearest mission within 100 km was established;
- N_{st}^{100}: count of missions within 100 km at time t.

In total, 135 sub-districts are eventually treated (receive a mission within 100 km during the sample period) and 12 are never-treated. The estimation sample contains 163,858 observations with non-missing event time.

5 Empirical Strategy

5.1 Identification

We exploit the staggered rollout of mission stations across the Cape Colony. The identifying assumption is that, conditional on sub-district and year fixed effects, the timing of mission station establishment is orthogonal to potential outcomes—that is, missions were not systematically placed in locations experiencing differential trends in Khoe employment or agricultural output.

This assumption is supported by several features of the historical record. Mission locations were determined by a combination of government land grants, missionary-society logistics, and proximity to existing Khoe communities—not by the agricultural productivity of neighbouring settler farms (Kruger, 1966; Elbourne, 2002). The Moravians received the farm Baviaanskloof (later Genadendal) from the government specifically because it was remote and unsuitable for profitable agriculture. The LMS established Bethelsdorp on marginal land near Algoa Bay. The Rhenish missions in Tulbagh and Stellenbosch received land donations from individual settlers sympathetic to the missionary cause. In no case was a mission station placed in response to conditions in the surrounding settler agricultural economy.

We test for pre-trends in the event-study framework (Section 5.3) and conduct a placebo test by randomly permuting establishment dates (Section 6.7).

5.2 Two-Way Fixed Effects (TWFE) specification

Our baseline estimating equation is:

$$Y_{ist} = \alpha_s + \gamma_t + \beta \cdot \text{Post}_{st} + \varepsilon_{ist} \tag{11}$$

where Y_{ist} is an outcome for farm i in sub-district s at time t; α_s are sub-district fixed effects; γ_t are year fixed effects; and $\text{Post}_{st} = \mathbb{1}[\text{nearest mission within 100 km exists at time } t]$. Standard errors are clustered at the sub-district level.

The sub-district fixed effects absorb all time-invariant differences across locations—including soil quality, distance to markets, and persistent differences in the Khoe and settler populations. The year fixed effects absorb colony-wide shocks: droughts, British policy changes, trade fluctuations, and frontier conflicts. The coefficient β is identified from the within-sub-district, within-year variation created by the staggered establishment of stations.

We estimate Equation (11) separately for Khoe outcomes (total Khoe workers, Khoe share of the labour force) and slave outcomes (total slaves, slave share). The pattern of results across these outcomes—significant effects on the Khoe margin, null effects on the slave margin—constitutes the core evidence for a Khoe-specific outside-options mechanism.

We also estimate a continuous specification:

$$Y_{ist} = \alpha_s + \gamma_t + \delta \cdot \ln(\text{Dist}_{st}) + \varepsilon_{ist} \tag{12}$$

where Dist_{st} is the distance in kilometres to the nearest existing mission.

5.3 Event study

To trace the dynamic evolution of treatment effects and assess the parallel-trends assumption, we estimate:

$$Y_{ist} = \alpha_s + \gamma_t + \sum_{\substack{k=-15 \\ k\neq -1}}^{25} \beta_k \cdot \mathbb{1}[t - E_s = k] + \varepsilon_{ist} \tag{13}$$

where E_s is the year the first mission within 100 km of sub-district s was established. Pre-treatment coefficients $\{\beta_k\}_{k<0}$ test the parallel-trends assumption. Post-treatment coefficients $\{\beta_k\}_{k\geq 0}$ trace the dynamic treatment path. The event-study plots for Khoe outcomes are our primary visual evidence; the corresponding slave plots serve as falsification tests.

5.4 Heterogeneity and policy interactions

We decompose treatment effects along three dimensions. First, we split the sample into *arable* districts (Stellenbosch, Tulbagh, Cape) and *pastoral* districts (Graaff-Reinet, Swellendam) to test whether the Khoe outside-option effect differs by the structure of Khoe labour demand. Second, we create society-specific treatment indicators to

test whether Moravian, LMS, and other missions produced different effects on Khoe employment. Third, and most critically, we interact the treatment with Ordinance 50 of 1828:

$$Y_{ist} = \alpha_s + \gamma_t + \beta_1 \text{Post}_{st} + \beta_2(\text{Post}_{st} \times \text{After1807}_t) + \beta_3(\text{Post}_{st} \times \text{After1828}_t) + \varepsilon_{ist} \tag{14}$$

The coefficient β_3 is our primary test of Proposition 3: that the Khoe outside option, dormant under the pass system, is activated by Ordinance 50. If the mechanism is Khoe-specific, then β_3 should be significant for Khoe outcomes and for slave outcomes (through equilibrium substitution away from slaves once Khoe labour becomes freely available), but the pattern should be asymmetric—with the Khoe effect representing a direct outside-options channel and the slave effect representing an indirect substitution response.

6 Results

6.1 Descriptive evidence

Figure 2 plots mean farm-level outcomes over time by district, revealing the secular decline in slaveholding across all districts, the heterogeneity in livestock intensity, and the spatial variation in Khoe employment. Figure 3 compares raw means for ever-treated versus never-treated farms, providing a first visual impression that Khoe employment diverges after treatment.

6.2 Main results: the Khoe respond, slaves do not

Table 3 reports the main results from Equation (11). The results are striking in their asymmetry. The establishment of a mission station within 100 km produces a large and statistically significant increase in *Khoe* employment: total Khoe workers rise by 1.37 per farm ($p < 0.01$), and the Khoe share of the labour force increases by 0.18 ($p < 0.01$). In contrast, total slaves show a positive but statistically *insignificant* point estimate ($+0.14$), and the slave share is negative but insignificant (-0.12).

This pattern is precisely what the Khoe outside-options framework predicts. Mission stations affect the Khoe margin because the Khoe—though constrained by pass laws—could and did gravitate toward missions, expanding the local Khoe labour supply available to surrounding farms. Slaves, as chattel property with no capacity to exercise outside options, are unaffected.

The Khoe effect is economically large. The mean number of Khoe workers per farm is 2.01, so the treatment effect of $+1.37$ represents an increase of approximately

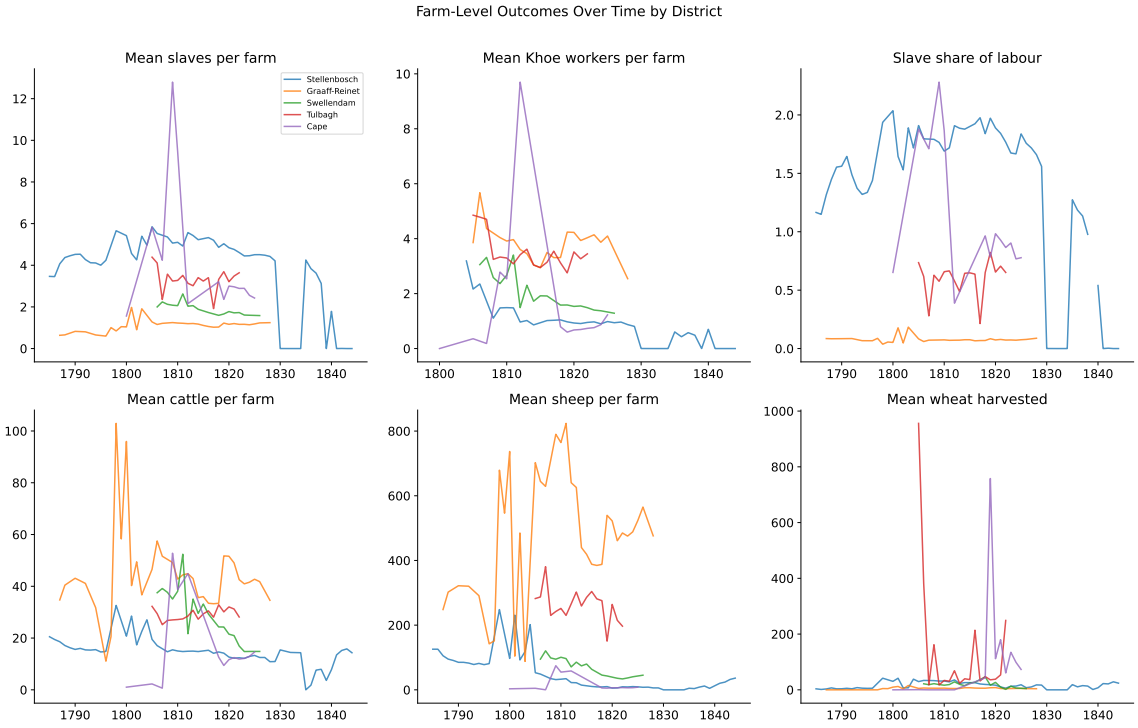

Figure 2: Farm-Level Outcomes Over Time by District

Notes: Annual means by district. Years with fewer than 30 observations per district excluded.

Figure 3: Treated vs. Control Farms: Raw Means Over Time

Notes: "Treated" farms are in sub-districts that eventually receive a mission within 100 km. "Control" farms are in sub-districts that never receive a mission within 100 km.

Table 3: Main Results: Two-Way Fixed Effects DiD Estimates

Outcome	$\hat{\beta}$	Clustered SE	N
Panel A: Khoe outcomes (direct outside-options channel)			
Total Khoe workers	1.368^{***}	(0.395)	146,881
Khoe share	0.181^{***}	(0.049)	116,424
Panel B: Slave outcomes (falsification — no direct channel)			
Total slaves	0.138	(0.134)	193,684
Slave share	-0.120	(0.117)	162,686
Panel C: Agricultural outcomes			
ln(cattle+1)	0.569^{**}	(0.284)	193,739
ln(sheep+1)	0.592^{**}	(0.286)	193,732
ln(wheat+1)	0.291^{**}	(0.125)	194,001
ln(wine+1)	-0.056^{***}	(0.021)	194,001

Notes: Each row is a separate regression. Treatment: $\text{Post}_{st} = 1$ if a mission station exists within 100 km of sub-district s at time t. Sub-district and year fixed effects. Standard errors clustered at the sub-district level. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$. Panels A and B highlight the asymmetric response: mission proximity reshapes the Khoe labour market but not slaveholding.

68% relative to the sample mean. This is consistent with missions functioning as Khoe population centres: as Khoe individuals gravitated toward missions—for refuge, community, or employment—the surrounding farms gained access to an enlarged Khoe labour pool.

The agricultural outcomes reinforce the Khoe-centred interpretation. The increases in livestock (cattle $+0.57$, sheep $+0.59$) are consistent with the pastoral skills of Khoe herders being more readily available to farms near missions. The decline in wine production (-0.06) reflects the substitution away from the most labour-intensive crop—wine required the intensive slave labour of the southwestern Cape—toward the pastoral activities at which Khoe workers excelled.

Table 4 confirms these patterns using the continuous distance specification. Farms closer to missions employ significantly more Khoe workers ($\hat{\delta} = -0.70$, $p < 0.05$) and have higher Khoe shares (-0.12, $p < 0.05$). The slave share has a *positive* coefficient ($+0.24$, $p < 0.05$), confirming that proximity to missions reduces slave reliance—but only through the Khoe channel, as total slaves show no significant direct response.

6.3 Event study

Figure 4 plots the event-study coefficients from Equation (13) for six key outcomes. The pre-treatment coefficients for Khoe workers and Khoe share are generally close to zero and statistically insignificant, supporting the parallel-trends assumption. Post-treatment, Khoe employment rises sharply within a few years of mission establish-

Table 4: Continuous Treatment: Log Distance to Nearest Mission

Outcome	$\hat{\delta}$	Clustered SE	N
Khoe outcomes			
Total Khoe workers	-0.696^{**}	(0.342)	146,881
Khoe share	-0.123^{**}	(0.050)	116,424
Slave outcomes			
Total slaves	-0.081	(0.140)	170,081
Slave share	0.242^{**}	(0.098)	139,359
Agricultural outcomes			
ln(cattle+1)	-0.300	(0.228)	170,136
ln(sheep+1)	-0.411	(0.264)	170,130
ln(wheat+1)	-0.132	(0.144)	170,394
ln(wine+1)	0.088^{***}	(0.017)	170,394

Notes: Each row regresses the outcome on $\ln(\text{Dist}_{st})$, with sub-district and year FE. A negative coefficient indicates that farms *closer* to missions have higher values.

ment and persists throughout the observation window.

The event-study plots for slave outcomes provide the clearest visual evidence for the Khoe-specificity of the mechanism: the pre- and post-treatment slave coefficients fluctuate around zero without any discernible break at mission establishment. Missions move the Khoe margin; they do not move the slave margin.

6.4 The decisive test: Ordinance 50 and the activation of the Khoe outside option

Table 5 presents the paper's most important result. The interaction with Ordinance 50 of 1828 reveals that the full effect of mission proximity on the colonial labour market materialised only after the pass system was abolished—precisely because the mechanism operates through Khoe mobility.

Before 1828, the base treatment effect on Khoe workers is already large and significant ($+1.28$, $p < 0.01$): missions attracted Khoe populations and expanded the surrounding farm labour supply even under the pass regime. But the slave margin is flat—the base effect on total slaves is -0.01 (effectively zero). The pass system prevented Khoe workers from credibly threatening to leave, so the outside option, while latent, could not yet discipline settler-employers into substituting away from slave labour.

After 1828, the picture changes dramatically. The Post $\times$ After 1828 interaction reduces total slaves by an additional 0.47 per farm ($p < 0.05$), reduces the slave share by 0.11 ($p < 0.05$), and increases Khoe workers by a further 0.84 ($p < 0.10$). This is the

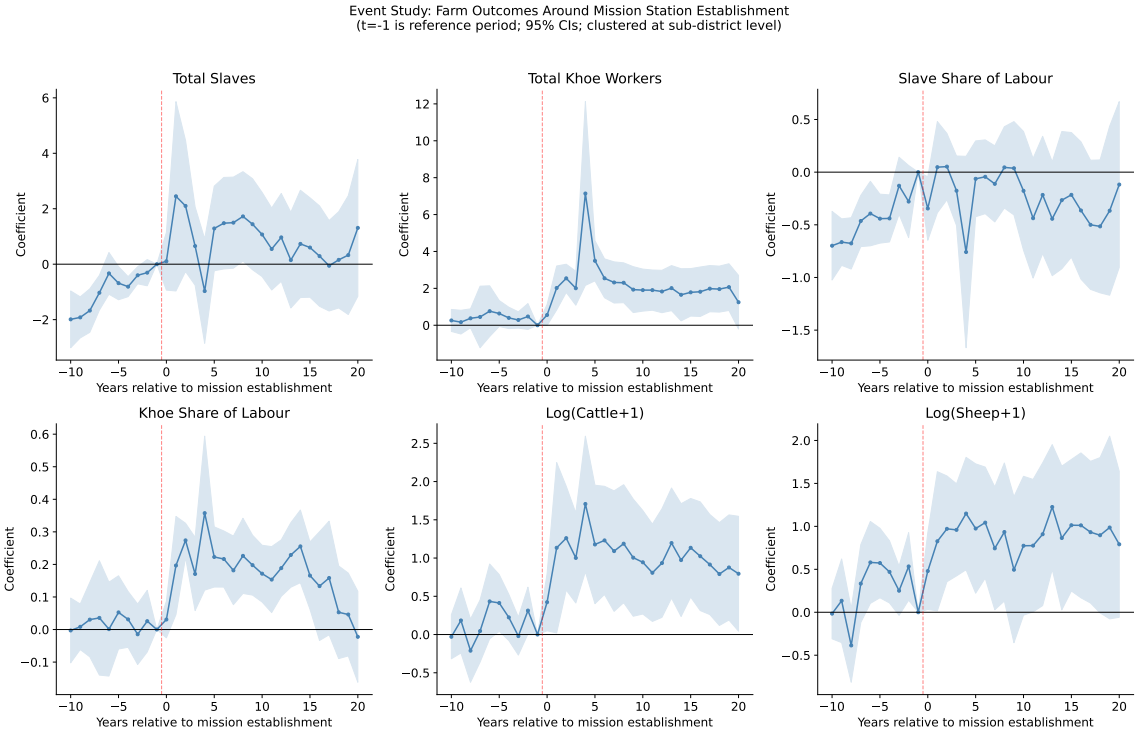

Figure 4: Event Study: Farm Outcomes Around Mission Station Establishment

Notes: Each panel plots $\hat{\beta}_k$ from Equation (13), with $k = -1$ as the reference period. Shaded areas are 95% confidence intervals (SEs clustered at sub-district level). The red dashed line marks mission establishment ($k = 0$). Event time is binned at $[-15, +25]$. The contrast between the responsive Khoe panels and the flat slave panels illustrates the Khoe-specificity of the outside-options channel.

activation of the Khoe outside option. With the pass system abolished, Khoe workers near missions could now credibly threaten to leave—or actually leave—settlers who offered poor conditions. Settlers responded by reducing their slave holdings (which were now more expensive to maintain relative to the freely available Khoe labour) and increasing their Khoe workforce.

Table 5: The Activation of the Khoe Outside Option: Interaction with Key Policy Shocks

	Total Slaves	Total Khoe	Slave Share
Post (mission <100km)	−0.013	1.284***	−0.169
	(0.139)	(0.394)	(0.113)
Post × After 1807	0.231*	0.091	0.082
	(0.136)	(0.235)	(0.057)
Post × After 1828	−0.466**	0.839*	−0.115**
(Ordinance 50: Khoe pass system abolished)	(0.224)	(0.493)	(0.055)
N	193,684	146,881	162,686

Notes: After 1807 $= \mathbb{1}[t \geq 1807]$ (slave trade abolition); After 1828 $= \mathbb{1}[t \geq 1828]$ (Ordinance 50, abolishing the Khoe pass system). Sub-district and year FE; SEs clustered at sub-district level. The Post × After 1828 interaction captures the activation of the Khoe outside option once the institutional barrier to Khoe mobility was removed.

The 1807 slave trade ban interaction tells a complementary story. The marginally significant positive coefficient on total slaves ($+0.23$, $p < 0.10$) suggests that the closure of the external slave supply initially *increased* slave retention near missions—perhaps because the availability of Khoe labour through mission networks made these areas more productive, raising the return to holding slaves. This effect is entirely consistent with the Khoe-centred narrative: the 1807 ban affected the slave margin through supply, not through outside options.

The Ordinance 50 result supports Proposition 3: outside options require complementary institutions to become effective. Before 1828, the pass system rendered mission stations a theoretical but not practical Khoe refuge—the Khoe could not legally leave without documentation. Ordinance 50 transformed the mission from a distant promise into a credible threat of exit, activating the substitution away from slaves toward freely mobile Khoe labour.

6.5 Heterogeneity by district type

Table 6 reports results separately for arable (Stellenbosch, Tulbagh, Cape) and pastoral (Graaff-Reinet, Swellendam) districts. The Khoe effect is significant in both settings but larger in arable districts: $+2.37$ ($p < 0.05$) versus $+0.85$ ($p < 0.05$). The slave share

declines significantly only in arable districts (-0.60, $p < 0.10$), where slave-intensive agriculture created the greatest scope for substitution toward Khoe labour.

Table 6: Heterogeneity by District Type: Khoe Effects Across Agricultural Settings

	Arable districts		Pastoral districts	
Outcome	$\hat{\beta}$	SE	$\hat{\beta}$	SE
Total slaves	-0.577	(0.383)	0.100	(0.188)
Total Khoe	2.368^{**}	(0.276)	0.846^{**}	(0.399)
Slave share	-0.602^{*}	(0.172)	-0.017	(0.013)
ln(cattle+1)	1.378^{***}	(0.102)	0.186	(0.173)
ln(sheep+1)	1.586^{***}	(0.097)	0.260	(0.190)
N	≈128,000		≈66,000	

Notes: Arable districts: Stellenbosch, Tulbagh, Cape. Pastoral: Graaff-Reinet, Swellendam. Sub-district and year FE; SEs clustered at sub-district level. The Khoe effect is significant in both settings, but the substitution away from slaves occurs only in the arable districts where slave-intensive agriculture created the greatest scope for labour recomposition.

The stronger arable-district effect is interpretable through the Khoe lens. The south-western Cape had more missions established in closer succession (Genadendal, Groenekloof, Elim, Pniel, Stellenbosch mission, Goedverwacht), creating a denser network of Khoe refuges. The diversified agricultural economy—combining wine, wheat, and livestock—offered Khoe workers more employment alternatives than the specialised pastoral economy of the frontier. And crucially, the arable districts were the heartland of Cape slavery; the availability of Khoe labour through mission networks provided the most direct substitute for the slave workforce.

In pastoral districts, where settlers already relied heavily on Khoe herders, missions expanded the Khoe labour supply ($+0.85$) but did not displace slaves (who were scarce to begin with). The Khoe outside-option mechanism is operative in both settings, but its downstream effects on the slave margin depend on the local labour market structure.

6.6 Heterogeneity by missionary society

Table 7 decomposes the treatment by the identity of the nearest missionary society. Moravian missions have the largest effect on Khoe employment ($+1.71$, $p < 0.01$) and livestock ($+0.78$, $p < 0.01$). LMS missions also significantly increase Khoe employment ($+1.03$, $p < 0.01$).

These differential effects are consistent with the societies' distinct relationships with the Khoe population. The Moravians operated the largest and longest-established

Table 7: Heterogeneity by Missionary Society: Effects on Khoe and Slave Outcomes

	Total Slaves	Total Khoe	Slave Share	ln(Cattle)
Post × LMS	0.513	1.026***	0.079	0.160
	(0.326)	(0.311)	(0.062)	(0.188)
Post × Moravian	−0.064	1.712***	−0.201	0.775***
	(0.152)	(0.323)	(0.174)	(0.272)
Post × Other	0.962**	0.334	0.081	−0.071
	(0.385)	(0.412)	(0.131)	(0.137)

Notes: Each column is a separate regression. "Post × Society" equals one if a mission of that society is the nearest existing mission within 100 km. Omitted: never-treated/pre-treatment. Sub-district and year FE; SEs clustered at sub-district level. The Moravian and LMS effects on Khoe labour are consistent with these societies' extensive engagement with Khoe communities.

stations: Genadendal housed over 3,000 residents by the 1830s, the vast majority of whom were Khoe (Kruger, 1966). The Moravians emphasised artisanal training, agricultural self-sufficiency, and community building—creating exactly the kind of material and social infrastructure that constituted a credible Khoe outside option. The LMS, under Van der Kemp and Read, adopted an explicitly *pro-Khoe* advocacy position, directly challenging settler coercion in colonial courts. The "Other" category (Rhenish, SAfMS, Wesleyan, Glasgow) shows no significant Khoe effect, consistent with the later establishment and smaller scale of these missions.

The total-slaves column is instructive as a falsification check: neither the Moravian nor the LMS coefficient is significant for slaves, confirming that the mechanism operates exclusively through the Khoe channel. The positive and significant "Other" coefficient for slaves ($+0.96$, $p < 0.05$) likely reflects the late establishment of these missions (mostly post-1828) in areas experiencing concurrent trends in slaveholding.

6.7 Robustness

Alternative distance thresholds. Table 8 varies the treatment radius from 50 to 200 km. The Khoe labour effect peaks at 75–100 km ($+1.31$ to $+1.37$, $p < 0.01$) and dissipates at larger radii, consistent with a geographically bounded labour market effect. This concave distance profile supports the interpretation that missions affected Khoe labour supply within a plausible migration radius, rather than capturing spurious colony-wide trends.

Placebo test. We randomly permute the assignment of establishment years across treated sub-districts and re-estimate Equation (11) 500 times. Figure 5 shows that the actual Khoe treatment estimate lies outside the distribution of placebo coefficients, confirming that the results are not driven by spurious correlation.

Table 8: Robustness: Alternative Distance Thresholds for Khoe and Slave Outcomes

	50 km	75 km	100 km	150 km	200 km
Total Khoe (direct outside-options channel)					
$\hat{\beta}$	0.853*	1.312***	1.368***	−0.012	0.046
SE	(0.443)	(0.400)	(0.395)	(0.171)	(0.135)
Total Slaves (falsification)					
$\hat{\beta}$	−0.118	0.039	0.138	0.483	0.307
SE	(0.196)	(0.124)	(0.134)	(0.299)	(0.258)
Slave Share					
$\hat{\beta}$	−0.067	−0.151	−0.120	0.079	0.069
SE	(0.178)	(0.141)	(0.117)	(0.064)	(0.081)

Notes: Each cell reports $\hat{\beta}$ from TWFE using the indicated radius. $N \approx 194{,}000$. Sub-district and year FE; SEs clustered at sub-district level. The Khoe effect peaks at 75–100 km and dissipates beyond; the slave effect is insignificant throughout.

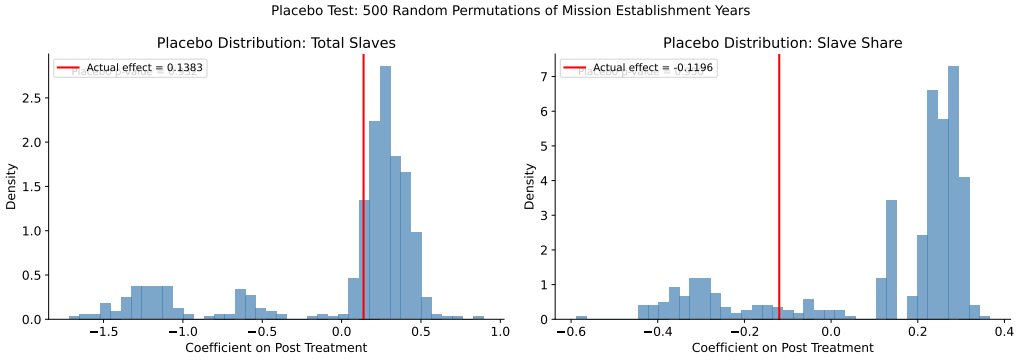

Figure 5: Placebo Test: 500 Random Permutations of Establishment Years

Notes: Histograms show the distribution of $\hat{\beta}$ from 500 regressions with randomly shuffled establishment years. Red line marks the actual estimate. The Khoe effect (top panels) lies far outside the placebo distribution; the slave effect (bottom) does not.

7 Discussion

7.1 A Khoe story, told through two margins

The results tell a coherent and specifically Khoe story. The indigenous Khoe of the Cape Colony were trapped in a coercive equilibrium: stripped of their pastoral livelihood, bound to settler farms by pass laws and vagrancy ordinances, and denied the mobility that would have allowed them to seek better conditions. Mission stations disrupted this equilibrium by providing the Khoe with something they had lost—a place to go.

The evidence for this interpretation comes from the asymmetry between the two margins, as predicted by Propositions 1 and 2. The Khoe margin responds immediately and significantly to mission establishment: Khoe employment on nearby farms increases by 1.4 workers, consistent with missions functioning as Khoe population centres that expanded the surrounding labour supply. The slave margin does not respond—because $\bar{u}_S = 0$ is invariant to mission proximity (equation 4). This contrast is not a limitation of our data; it is the core test. If we were measuring a generic labour market shock (such as increased demand for agricultural labour near missions), both labour types would respond. The fact that only the Khoe margin responds demonstrates that the channel is outside options, not demand.

The Ordinance 50 interaction clinches the argument. In the language of our model, before 1828 the institutional access parameter is $\lambda_t = 0$: the mission proximity premium $\varphi(m_i)$ is attenuated by the factor $(1 - \theta)$, rendering the outside option latent. After 1828, $\lambda_t = 1$ and the full premium is activated. The positive cross-derivative in Proposition 3 (equation 9) predicts exactly the pattern we observe: the resulting substitution away from slaves (-0.47) and toward Khoe labour ($+0.84$) represents the activation of the outside-options mechanism. Employers, facing workers who could now credibly threaten to leave for a nearby mission, adjusted their labour composition. The slave decline is not because slaves gain an outside option—$\bar{u}_S$ remains zero—but because the activated Khoe channel alters the relative cost of the two labour types, inducing the equilibrium substitution of equation (10).

7.2 Reconciliation with prior work

Our findings reconcile a puzzle in the earlier version of this study, which focused exclusively on the frontier districts of Graaff-Reinet and Tulbagh. That analysis found that reduced coercion (through the 1809 Hottentot Proclamation) led to lower Khoe effort on settler farms. The interpretation was that, in the absence of outside options, loosening coercion simply reduces worker effort—the Acemoglu-Wolitzky prediction when the outside option is zero.

The present analysis, covering the full Colony, reveals that this frontier result is one side of a two-sided coin. On the frontier (Graaff-Reinet), where missions were distant (mean distance: 224 km) and the Khoe had no practical alternative to farm service, reduced coercion indeed lowered effort. In the southwestern Cape (Stellenbosch, Swellendam), where missions were nearby (mean distance: 47–63 km) and the Khoe had a credible refuge, the effect was the opposite: Khoe workers entered the farm economy in greater numbers, on better terms, and with the bargaining power that comes from the ability to walk away.

The frontier and the heartland thus represent the two limiting cases of our model: on the frontier, $\varphi(m_i) \approx 0$ (missions are distant), so $\bar{u}_K \approx \bar{u}_0$ regardless of λ_t—reduced coercion simply lowers effort. Near missions, $\varphi(m_i) > 0$, and the predictions of Propositions 1 and 3 apply: Khoe labour responds to missions, and the response is amplified by Ordinance 50. The contrast between them provides a uniquely clean empirical illustration of the theory.

7.3 Broader implications

The Khoe case offers a broader lesson about the conditions under which coercive labour institutions erode. The persistence of Khoe servitude at the Cape was not merely a function of labour scarcity or enforcement capacity. It was sustained by the absence of alternatives. When alternatives became available—through mission stations—and accessible—through Ordinance 50—the coercive equilibrium shifted.

This two-part mechanism—captured in equation (5) by the interaction of $\varphi(m_i)$ (the destination) and λ_t (the institutional access)—echoes findings from other historical settings. Markevich and Zhuravskaya (2018) show that the abolition of Russian serfdom improved outcomes primarily in regions with better outside options (proximity to cities and factories). Naidu and Yuchtman (2013) demonstrate that the relaxation of contract enforcement in industrial Britain facilitated worker mobility and improved bargaining outcomes. In each case, the formal relaxation of coercion was necessary but not sufficient; complementary changes in the outside-options landscape were required for liberalisation to bite.

The Khoe case is distinctive because the coerced population was nominally free throughout—making the outside-options mechanism especially transparent. The Khoe did not need manumission or emancipation; they needed a place to go and the legal right to get there. Mission stations provided the first; Ordinance 50 provided the second. Together, they eroded a coercive system that had operated for more than a century.

7.4 Limitations

Several limitations merit acknowledgement. First, three of five districts lack sub-district geographic identifiers, meaning that treatment variation for 66% of observations is purely temporal. This reduces our effective cross-sectional variation and likely attenuates estimates. Second, each farm identifier in the *opgaafrol* is unique per row, precluding true panel analysis with farm fixed effects; our results should be interpreted as repeated cross-section estimates. Third, the TWFE estimator may produce biased estimates under heterogeneous treatment effects with staggered adoption (Goodman-Bacon, 2021; de Chaisemartin and D'Haultfœuille, 2020). Future work should implement robust staggered-DiD estimators (Callaway and Sant'Anna, 2021; Sun and Abraham, 2021). Fourth, we cannot directly observe whether individual Khoe workers moved between farms and missions; the farm-level data reveal outcomes but not the micro-level mechanism of Khoe mobility.

8 Conclusion

This paper provides new evidence on how outside options reshaped the coercion of indigenous Khoe labour in the Cape Colony. The Khoe—nominally free but effectively bound by pass laws and vagrancy ordinances—occupied a unique position in the political economy of colonial coerced labour. Mission stations provided them with a credible alternative to servitude, and the abolition of the pass system under Ordinance 50 of 1828 activated that alternative.

Our findings are sharp and map directly onto the four propositions derived from our adaptation of the Acemoglu and Wolitzky (2011) framework. Mission proximity increases Khoe employment (Proposition 1); it does not affect slaveholding (Proposition 2). The decisive result is the Ordinance 50 interaction (Proposition 3): only after the Khoe gained freedom of movement—that is, only after $\lambda_t = 1$ activated the full mission proximity premium—did mission proximity reduce slave reliance through equilibrium substitution. The heterogeneity across missionary societies (Proposition 4) confirms that the strength of the outside option depends on the quality of the institutional alternative provided. Together, these results demonstrate that outside options require both a destination (the mission, $\varphi(m_i) > 0$) and the institutional freedom to reach it (Ordinance 50, $\lambda_t = 1$).

The Khoe story told here extends beyond the Cape. Historical and contemporary labour markets alike are shaped not only by the existence of alternatives but by the institutions that govern access to them. For the indigenous Khoe of the Cape Colony, mission stations and legal reform together broke the coercive equilibrium. This two-part mechanism—creating outside options and removing the barriers to accessing

them—is the general lesson of the Khoe experience.

References

Acemoglu, D. and Wolitzky, A. (2011). The economics of labor coercion. *Econometrica*, 79(2):555–600.

Barzel, Y. (1977). An economic analysis of slavery. *The Journal of Law and Economics*, 20(1):87–110.

Baten, J. and Szoltysek, M. (2012). The human capital of Central-Eastern and Eastern Europe in European perspective. *Max Planck Institute for Demographic Research Working Paper*.

Becker, B. and Meier zu Selhausen, F. (2023). Women on a mission: Protestant legacies of gender equality in Africa? *African Economic History Working Paper Series*, 72.

Callaway, B. and Sant'Anna, P.H.C. (2021). Difference-in-differences with multiple time periods. *Journal of Econometrics*, 225(2):200–230.

Cilliers, J. and Mariotti, M. (2019). The shaping of a settler fertility transition: eighteenth- and nineteenth-century South African demographic history reconsidered. *European Review of Economic History*, 23(4):421–445.

Clarence-Smith, W.G. (2013). *The Economics of the Indian Ocean Slave Trade in the Nineteenth Century*. Routledge.

de Chaisemartin, C. and D'Haultfœuille, X. (2020). Two-way fixed effects estimators with heterogeneous treatment effects. *American Economic Review*, 110(9):2964–2996.

Delius, P. and Trapido, S. (1982). Inboekselings and Oorlams: the creation and transformation of a servile class. *Journal of Southern African Studies*, 8(2):214–242.

Domar, E.D. (1970). The causes of slavery or serfdom: a hypothesis. *The Journal of Economic History*, 30(1):18–32.

Dooling, W. (1992). Slavery and amelioration in the Graaff-Reinet District, 1823–1830. *South African Historical Journal*, 27(1):75–94.

Dooling, W. (2005). The origins and aftermath of the Cape Colony's 'Hottentot Code' of 1809. *Kronos*, pp. 50–61.

Du Plessis, S., Jansen, A. and von Fintel, D. (2015). Slave prices and productivity at the Cape of Good Hope from 1700 to 1725: Did everyone win from the trade? *Cliometrica*, 9(3):289–330.

Elbourne, E. (2002). *Blood Ground: Colonialism, Missions, and the Contest for Christianity in the Cape Colony and Britain, 1799–1853*. McGill-Queen's University Press.

Elphick, R. and Giliomee, H. (1979). *The Shaping of South African Society, 1652–1840*. Wesleyan University Press.

Eltis, D. (1993). Europeans and the rise and fall of African slavery in the Americas: an interpretation. *The American Historical Review*, 98(5):1399–1423.

Fogel, R.W. and Engerman, S. (1974). *Time on the Cross: The Economics of American Negro Slavery*. Little, Brown.

Fourie, J. and Green, E. (2015). The missing people: accounting for the productivity of indigenous populations in Cape Colonial History. *The Journal of African History*, 56(2):195–215.

Fourie, J. and Von Fintel, D. (2011). A history with evidence: Income inequality in the Dutch Cape Colony. *Economic History of Developing Regions*, 26(1):16–48.

Galenson, D.W. (1984). The rise and fall of indentured servitude in the Americas: an economic analysis. *The Journal of Economic History*, 44(1):1–26.

Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. *Journal of Econometrics*, 225(2):254–277.

Groenewald, G. (2010). Slaves and free blacks in VOC Cape Town, 1652–1795. *History Compass*, 8(9):964–983.

Guelke, L. and Shell, R. (1983). An early colonial landed gentry: land and wealth in the Cape Colony 1682–1731. *Journal of Historical Geography*, 9(3):265–286.

Harries, P. (2001). Missionaries, Marxists and magic: power and the politics of literacy in southeast Africa. *Journal of Southern African Studies*, 27(3):405–427.

Klein, A. and Ogilvie, S. (2017). Was Domar Right? Serfdom and factor endowments in Bohemia. *Working paper*.

Kruger, B. (1966). *The Pear Tree Blossoms: A History of the Moravian Mission Stations in South Africa, 1737–1869*. Genadendal.

Lovejoy, P.E. (2011). *Transformations in Slavery: A History of Slavery in Africa*. Cambridge University Press.

Malherbe, V.C. (1978). *Diversification and Mobility of Khoikhoi Labour in the Eastern Districts of the Cape Colony prior to the Labour Law of 1 November 1809*. PhD thesis, University of Cape Town.

Markevich, A. and Zhuravskaya, E. (2018). The economic effects of the abolition of serfdom: Evidence from the Russian Empire. *American Economic Review*, 108(4–5):1074–1117.

Meier zu Selhausen, F. (2014). Missionaries and female empowerment in colonial Uganda: New evidence from Protestant marriage registers, 1880–1945. *Economic History of Developing Regions*, 29(1):74–112.

Naidu, S. and Yuchtman, N. (2013). Coercive contract enforcement: law and the labor market in nineteenth century industrial Britain. *American Economic Review*, 103(1):107–144.

Newton-King, S. (1999). *Masters and Servants on the Cape Eastern Frontier, 1760–1803*. Cambridge University Press.

Nieboer, H. (1900). *Slavery as an Industrial System*. Martinus Nijhoff.

Ogilvie, S. (2007). 'Whatever is, is right'? Economic institutions in pre-industrial Europe. *The Economic History Review*, 60(4):649–684.

Penn, N. (2005). *The Forgotten Frontier: Colonist and Khoisan on the Cape's Northern Frontier in the 18th Century*. Juta.

Ross, R. (1993). Emancipations and the economy of the Cape Colony. *Slavery and Abolition*, 14(1):131–148.

Rostovtzeff, M.I. (1926). *The Social and Economic History of the Roman Empire*. Biblo & Tannen.

Rönnbäck, K. (2016). Waged slavery—incentivizing unfree labour at Cape Coast Castle in the eighteenth century. *Slavery & Abolition*, 37(1):73–93.

Sales, J. (1975). *Mission Stations and the Coloured Communities of the Eastern Cape, 1800–1852*. Balkema.

Schoeman, K. (2007). Early slavery at the Cape of Good Hope, 1652–1717. *African Diaspora Archaeology Newsletter*, 10(4):16.

Shell, R.C.-H. (1994). *Children of Bondage: A Social History of the Slave Society at the Cape of Good Hope, 1652–1838*. Wesleyan University Press.

Stone, D. (1997). The productivity of hired and customary labour: evidence from Wisbech Barton in the fourteenth century. *The Economic History Review*, 50(4):640–656.

Sun, L. and Abraham, S. (2021). Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. *Journal of Econometrics*, 225(2):175–199.

Van der Merwe, P.J. (2006). *Die Trekboer in die Geskiedenis van die Kaapkolonie (1657–1842)*. African Sun Media.

Worden, N. (1996). The making of modern South Africa. *The English Historical Review*, 111(443):1016–1018.