

# Southern Africa Labour and Development Research Unit



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*by*

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## About the Author(s) and Acknowledgments

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# The Labour Supply of Sex Workers in Cape Town

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## Abstract

*Traditional labour economics predicts that the supply of labour will increase as earnings increase. However, labour supply need not be positive, especially if workers make decisions based on short-term income targets. Income targeting may best describe jobs where workers decide on working hours and where wages are uncorrelated across days. This paper examines the labour supply of sex workers in Cape Town, whose working conditions largely fulfill these criteria. Contrary to traditional economic theory, we find evidence of a negative labour supply curve.*

Keywords: Labour supply, sex workers, hyperbolic discounting

## Introduction

Global and local estimates of the size of the sex work industry are scarce (Vanwesenbeeck, 2001). Yet, available evidence suggests that in many nations around the world, non-negligible proportions of the female (and to a lesser extent male) population engage in sex work (see Table 1), and there is wide consensus that the industry is growing (Vandepitte et al, 2006; Levitt and Dubner, 2009). Yet, very little is known about the nature of the industry, particularly the demand for sex. More information is available on the supply side, since it's easier to identify sex workers as opposed to their clients, but even here, information is scarce. Consider that a much smaller fraction of the world female population hold political positions, yet much more is known about women in politics than women in sex work (UN Department of Public Information, 2005). The predominance of sociological and psychological literature on sex work also highlights the fact that very few researchers have seriously considered the economics of sex work. As Vanwesenbeeck (2001) points out, “the literature is still much more about sex than it is about work.” This paper makes a contribution in rectifying this, by examining the labour supply of sex workers in Cape Town.

In this analysis, which relies on data collected by the Sex Worker Education and Advocacy Taskforce (SWEAT), sex work is treated as a standard service sector industry, and sex workers are viewed as economic agents who actively and voluntarily engage in sex work. While this latter point may be contested, qualitative data collected by SWEAT researchers suggests that this is the correct way to view sex workers in Cape Town. Contrary to traditional economic theory which posits an upward sloping labour supply curve, we find evidence of a negative labour supply curve. This is consistent with notions of income targeting, and accords with results from Camerer et al (2007) who study the labour supply of New York city cab drivers.

**Table 1: Estimated Percent of Female Population Operating as Sex Workers**

	Overall Prevalence	Year
WEST AFRICA <sup>1</sup>		
Benin	1.2%	2001
Burkina Faso	4.3%	2000–03
Cameroon	2.2%	1997
Ivory Coast	0.7%	2000–04
Ghana	1.1%	2003
Niger	2.6%	2004
EAST AFRICA		
Ethiopia	2.1%	2002
Kenya	4.3%	1997–99
ASIA		
Cambodia	0.4%	2003
Indonesia	0.4%	2002
Malaysia	0.9%	1999
Nepal	2.0%	2000
Philippines	2.6%	2000
Vietnam	0.2%	2000
EAST EUROPE		
Bulgaria	0.6%	2004
Romania	0.8%	2004
Croatia	0.5%	2004
Bosnia/Herzegovina	0.5%	2004
Serbia/Montenegro	0.6%	2004
Czech republic	0.4%	2004
Poland	0.6%	2004
Slovenia	1.4%	2004
WEST EUROPE		
Belgium	0.4%	2000
Netherlands	0.6%	2000
Luxembourg	0.4%	2000
United Kingdom	0.5%	2000
Austria	1.0%	2000
Germany	1.4%	2000
Finland	0.3%	2000
Norway	0.3%	2000
Italy	0.4%	2000
LATIN AMERICA		
Dom Republic	1.8%	2001
Belize	7.4%	2001
Haiti	2.0%	2001
Colombia	0.7%	2001
Venezuela	1.5%	2001

Source: Vanderpitte et al, 2006

Note: Figures for West and East Africa come from the capital city.

## The Supply of Sex Work

This paper considers sex workers as economic agents who explicitly exchange sexual services for money. It does not deal with other cases that might be part of a broader definition

of sex work, for example, transactional sex between partners in a relationship, where sex is associated with an implicit agreement of payment (Selikow and Gibbon, 2010), or situations of human trafficking. There are two broad categories of sex workers: outdoor/street workers, and indoor/agency workers, and typically, most pay some economic rent to a middle-man (a manager, agent or “pimp) in return for some degree of protection, or in the case of indoor workers, for access to premises and clients (Gould, 2008).

Traditional labour theory uses inter-temporal choice modeling to predict how workers make optimal decisions about the supply of their labour, and predicts that the supply of labour will increase as earnings increase. Because workers choose between leisure time and time working, an increased wage equates to an increase in the opportunity cost of leisure, resulting in a reduction in leisure time, and an associated increase in work time (Lucas and Rapping, 1969). By accurately discounting future utility, workers are expected to work longer hours when wage rates per hour are high and work fewer hours when wage rates per hour are low (Salvatore, 2003). An adaptation of these models argues that a positive relationship between time working and wages exists but only up to a point, after which workers no longer care about how much money they have, and thus respond negatively to further increases in wages. This theory is best depicted by a backwards-bending labour supply curve (Salvatore, 2003).

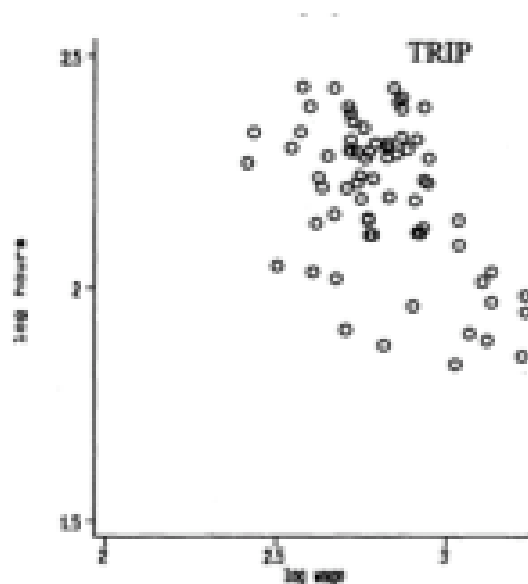
Thus, if one views sex work as a service requiring labour power, the higher the wage rate that can be commanded for providing sex, the more likely individuals are to supply that service, and vice versa. Only in the event that wages exceed some threshold level would one expect to see a decline in hours worked. <sup>1</sup>However, work by Camerer *et al* (1997) has presented a challenge to this traditional model of labour supply, arguing that labour supply need not be positive, especially if workers make decisions based on short-term target incomes. If workers consciously choose a target income for each day and work for as long as they need to until that target is reached, this produces an expected negative relationship between wage rates and time spent working. As wages per hour rise, workers have to spend *less* time on the job to reach their short-term target.

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<sup>1</sup> Notice that this relationship makes no judgement about whether sex workers view this profession as a preferred employment alternative, since sex workers are paid more than many other low level jobs and do not have tax obligations, or as an employer last resort (Posel, 1993).

This kind of behaviour can be attributed to two phenomena. First, is the empirically observed phenomenon that individuals tend to be hyperbolic discounters, which means that individuals value preferences differently across time, exhibiting short-run impatience and long-run patience (Thaler, 1985). This manifests in inconsistent choices. More specifically, workers may tend to focus on a one-day time horizon rather than aiming to smooth income by considering future wage prospects. Secondly, growing experimental evidence suggests that targeting does affect decision-making (Camerer et al, 1997). The cab drivers observed by Camerer et al (1997) for example, had to make the daily “rent” of the cab, and enough profit to be comfortable. This behaviour only applies to certain kinds of jobs, and certainly does not make sense for traditional formal sector occupations, with mandated hours. Instead, income targeting may best describe jobs where workers decide on working hours and where wages are uncorrelated across days. Camerer et al (2007) test this hypothesis by examining the behaviour of New York City cab drivers. These cab drivers are able to choose how long they want to work, and their wages tend to be uncorrelated across days primarily because their work is related to the weather. On rainy days, fewer New Yorkers are willing to walk, making it easier for cab drivers to find clients. They find a negative relationship between hours worked and wages (see Figure 1).

**Figure 1: Negative Labour Supply Curve found by Camerer et al (1997)**



Source: Camerer et al, 2007

Sex workers, especially street workers, are similar to cab drivers in both these respects. While agency based sex workers don't face the challenges of weather, street sex workers do. Sex workers are also affected by exogenous demand shocks, meaning their wages tend to be uncorrelated across days, and they have flexibility in the hours they work, although this is arguably more the case for street workers than agency workers (Gould, 2008). This paper adopts the approach of Camerer et al (2007) and examines the labour supply of sex workers in Cape Town.

## **Data**

The data used in this study was collected in 2005 by means of a short survey administered by outreach workers, on behalf of SWEAT, who interviewed 200 sex workers while they were working. Given that the sex workers interviewed had had previous contact with SWEAT, this suggests that the sample isn't random. To the extent that more marginalized sex workers may be under-represented in the data, this should be borne in mind in terms of the results. However, if it is the case that more marginalized sex workers tend to work longer hours for lower hourly wages/earnings, the absence of this group of workers from the data set would simply suggest that the results presented here could be strengthened by their inclusion.

Of the 200 sex workers interviewed, two sex workers reported their race as Indian, twelve were males, and two were transgender. Given these very small sample sizes on these dimensions, these sixteen observations were dropped, reducing the sample to 184. The remaining sample includes only female sex workers. Table 2 presents the summary statistics for the data set.



**Table 2: Summary Statistics**

	All	Indoor	Outdoor	Significance
Africans	32% (59/184)	15% (9/59)	85% (50/59)	
Whites	13% (23/184)	96% (22/23)	4% (1/23)	
Coloureds	(55%) (102/184)	58% (59/102)	42% (43/102)	
Age	27.08	26.59	27.55	
Experience (years as a sex worker)	4.18	3.25	5.07	**
No. Adults Supported	1.64	2.00	1.29	***
No. Children Supported	1.48	1.36	1.61	
Hours worked per Day	7.91	9.34	6.53	***
Average Daily Income (R)	417.53	507.87	331.08	***
Key: Income per hour (R)	63.25	56.85	69.38	

\*\*\*=significant at the 1% level, \*\*=significant at the 5% level

The majority of the sex workers interviewed were Coloured, followed by Africans, with only 13% of sex workers being White. All but one of the White sex workers worked indoors for some sort of agency, while the vast majority of African sex workers worked outdoors. By contrast, location of work is more evenly split amongst Coloured sex workers. Sex workers tend to be in their late twenties, and while outdoor workers are slightly older than indoor workers, these differences are not significant (Mann-Whitney  $z=-0.235$ ;  $p=0.8146$ ). The mean experience on the job (length of time spent as a sex worker) for all sex workers is 4.18

years, with outdoor workers having spent significantly longer time in this activity than indoor workers (Mann-Whitney  $z=-2.311$ ;  $p=0.0208$ ).

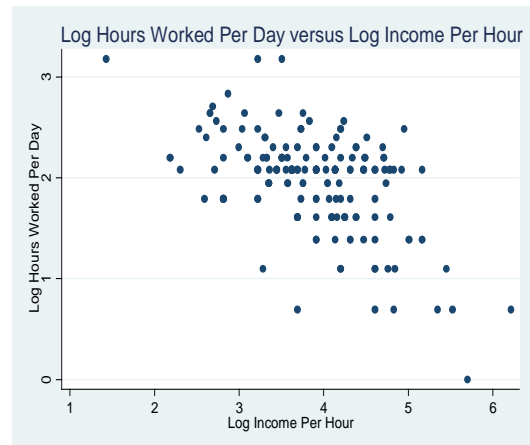
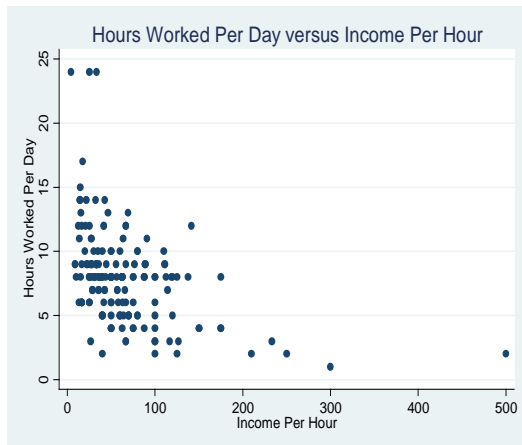
On average, sex workers support between 1 and 2 adults, with indoor workers reporting significantly higher adult dependency ratios (Mann-Whitney  $z=5.607$ ;  $p=0.0000$ ). According to SWEAT, this question was mostly interpreted as the number of adults the sex worker lived with, be it parents, grandparents, or a spouse. Similarly, sex workers support between 1 and 2 children, typically biological children, but there are no significant differences between indoor and outdoor workers in this regard (Mann-Whitney  $z=-0.738$ ;  $p=0.4607$ ).

On average, sex workers work 7.91 hours on a typical working day with indoor workers working significantly longer hours than outdoor workers (Mann-Whitney  $z=6.673$ ;  $p=0.0000$ ). This accords with previous research highlighting the fact that indoor sex workers are expected to work certain hours by managers, (Gould, 2008). Average daily income is the reported income earned by workers on an average day. The average daily income for all workers is R417.53, with indoor workers earning significantly higher amounts than outdoor workers (Mann-Whitney  $z=4.929$ ;  $p=0.0000$ ). This translates into an average income per hour of R56.85 for indoor workers compared to R69.38 for outdoor workers.

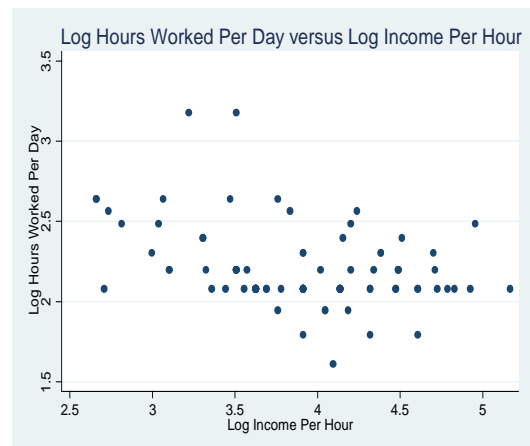
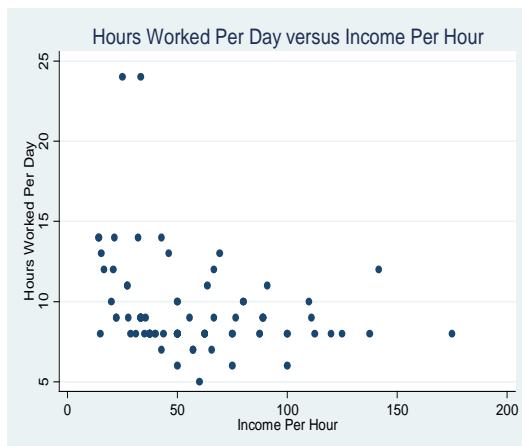
## **Results and discussion**

Following the traditional approach in economics, figures 2-7 present the labour supply curves for different categories of sex workers. The first diagram in each set compares hours worked to income per hour, while the second diagram in each set follows Camerer et al (1997) in taking logs of both variables in order to ensure that the results are not unduly influenced by some scale effect.

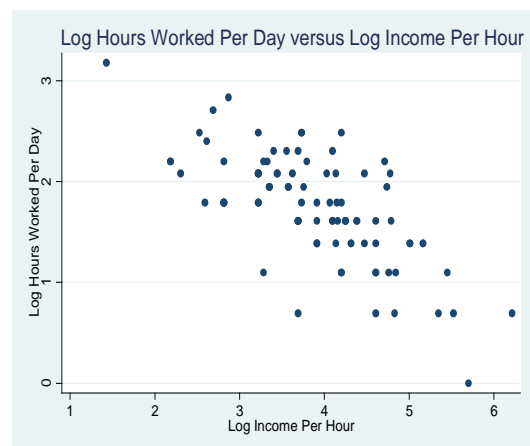
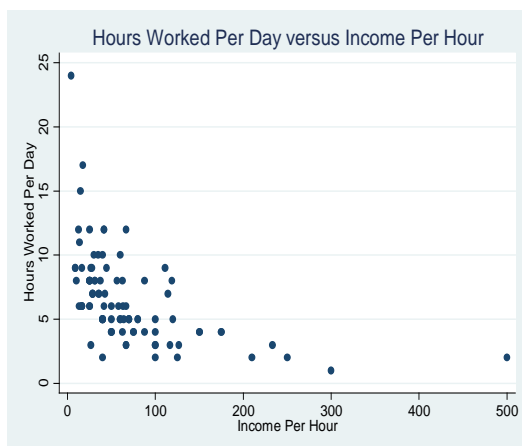
### Figures 2 and 3: Labour Supply Curves for All Sex Workers



### Figures 4 and 5: Labour Supply Curves for Indoor Sex Workers



### Figures 6 and 7: Labour Supply Curves for Outdoor Sex Workers



In every case, the results suggest a negative relationship between hours worked and hourly income earned, albeit the relationship is quite weak in the case of indoor sex workers. This relationship is strongest for outdoor workers as one might expect, since these workers have far more control over their working hours and prices charged than indoor workers. Interestingly, the log diagrams for all sex workers, and for indoor sex workers in particular, look very similar to figure 1 presented earlier from Camerer et al's (1997) analysis of New York City cab drivers. The negative relationship between hours worked and hourly earnings suggested by the figures is confirmed by the simple ordinary least squares regressions presented in Table 3<sup>2</sup>. The inclusion of the quadratic term suggests that at some point, the relationship does become less negative, although one would hardly classify this as a turning point.

**Table 3: OLS regressions demonstrating relationship between hours worked and hourly earnings.**

Hours per day worked	All		Indoor Workers		Outdoor workers		
	(1)	(2)	(3)	(1)	(2)	(1)	(2)
Income per Hour	-0.03 (0.006)***	-0.048 (0.009)***	-0.048 (0.009)***	-0.023 (0.009)*	-0.1012 (0.335)***	-0.024 (0.006)***	-0.0562 (0.0106)***
Income per Hour Squared		0.000 (0.000)***	0.000 (0.000)***		0.000 (0.00)*		0.000 (0.000)***
Woman works indoors			2.622(0.438)***				
R-Squared	0.177	0.208	0.343	0.063	0.128	0.241	0.332
Sample Size	182	182	182	89	89	93	93

Key: \*\*\*=significant at the 1% level, \*\*=significant at the 5% level ; \*=significant at 10% level  
Robust Standard Errors included in brackets.

<sup>2</sup> Note that the same regressions were run using a log-log specification (not reported), and the results did not change qualitatively.

Table 4 presents a final set of regression estimates that show that this negative relationship is robust to the inclusion of additional control variables. In these regressions it is clear that both indoor and outdoor workers exhibit a statistically significant negative relationship between hours worked and income per hour. This finding is similar to Camerer et al's (1997) finding that New York City cab drivers have daily income targets, and therefore quit as soon as they have reached the target. Workers who earn higher incomes per hour, for whatever reason, reach targets faster, assuming that targets aren't determined by income per hour. This is a reasonable assumption as targets are likely to be determined by exogenous personal circumstances and needs, and not by how much one earns in an hour, which is outside the workers' control. It might be argued that income per hour isn't outside the workers' control if they can offer different services that influence the income earned in an hour. This would be problematic because then targets would influence both hours worked and income per hour. This possibility certainly exists, and in the absence of better quantitative data on the kinds of services offered by sex workers and prices charged, cannot be excluded. However, previous qualitative research by Gould (2008) suggests that sex workers operating in the Cape Town market all offer most of the potential sexual services available. This leaves price differentiation (by area) as a potential explanatory factor in these results, but this is controlled for through the inclusion of dummy variables for location of work in the regression results.

The fact that indoor workers also exhibit a negative relationship between hours worked and income per hour is interesting. This might suggest that agency managers are also daily income targeters. This would mean that depending on the income per hour they can achieve from the workers available, they let workers leave early if they are able to earn more money per hour. There's no reason to think that daily income targeting would apply to sex workers but not their managers. When sex workers in clubs can earn more money per hour, managers achieve their take home daily targets faster by taking a fixed share of the hourly earnings of workers. This is an important addition to labour supply theory that considers employers as income targeters too.

**Table 4: Labour Supply Regressions with Additional Controls**

Hours per Day	All	Indoor Workers	Outdoor Workers
Income per Hour	-0.0565 (0.0111)***	-0.0933 (0.0383)**	-0.0705 (0.0151)***
Income per Hour Squared	0.00008 (0.00002)***	-0.0005 (0.0002)**	0.0001 (0.00003)***
Agency (works indoors)	1.9082 (0.8239)**		
Black	-0.7327 (0.9041)	-1.2931 (0.9290)	-0.2325 (0.7218)
Coloured	-7.1451 (0.9361)	-1.2184 (1.0895)	
Adults Supported	-0.0869 (0.1479)	-0.1477 (0.1522)	-0.1457 (0.5678)
Children Supported	-0.1530 (0.1971)	-0.5588 (0.3704)	-0.1421 (0.2984)
Adults Sup. by Children Sup.	0.0317 (0.0541)	0.2422 (0.1261)**	-0.0085 (0.1247)
Experience	0.1351 (0.1294)	0.2139 (0.4277)	0.1383 (0.1510)
Experience Squared	-0.0003 (0.0073)	-0.0140 (0.0408)	-0.0009 (0.0092)
R-Squared	0.5428	0.3332	0.6518
Sample Size	181	89	91

Key: \*\*\*=significant at the 1% level, \*\*=significant at the 5% level, \*=significant at the 10% level, Robust standard errors included in brackets. Additional controls (not reported) are included for the location where the sex worker works. These include Bellville, Central Business District, Claremont, Goodwood, Joostenbergvlakte, Kenilworth, Langa, Mfuleni, Mouillepoint, N7 Highway, Observatory, Parow, Plumstead, Saltriver, Seapoint, and Strand.

## **Conclusion**

Recent advances in behavioural economics have called into question many of the traditional assumptions that lie at the heart of neoclassical economics. A key finding has been the fact that individuals do not appear to exhibit constant discount rates over time, but rather, display behaviour consistent with hyperbolic discounting. This manifests in inconsistent choices. More specifically, workers may tend to focus on a one-day time horizon rather than aiming to smooth income by considering future wage prospects. Such behaviour is inconsistent with the traditional model of a backward bending labour supply curve. Rather, in the presence of income targeting, labour supply may in fact be negative. This paper finds evidence in support of a negative labour supply curve for sex workers in Cape Town. Of course, this behaviour only applies to certain kinds of jobs, and certainly does not make sense for traditional formal sector occupations, with mandated hours. However, it does raise interesting questions regarding the underlying models used to consider the labour supply decisions of workers engaged in occupations which allow flexibility in terms of work hours and earnings. This is a question that has not been given due consideration in the South African context, and suggests itself as a useful avenue for future research.

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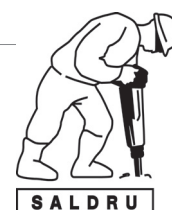


# southern africa labour and development research unit

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The Southern Africa Labour and Development Research Unit (SALDRU) conducts research directed at improving the well-being of South Africa's poor. It was established in 1975. Over the next two decades the unit's research played a central role in documenting the human costs of apartheid. Key projects from this period included the Farm Labour Conference (1976), the Economics of Health Care Conference (1978), and the Second Carnegie Enquiry into Poverty and Development in South Africa (1983-86). At the urging of the African National Congress, from 1992-1994 SALDRU and the World Bank coordinated the Project for Statistics on Living Standards and Development (PSLSD). This project provide baseline data for the implementation of post-apartheid socio-economic policies through South Africa's first non-racial national sample survey.

In the post-apartheid period, SALDRU has continued to gather data and conduct research directed at informing and assessing anti-poverty policy. In line with its historical contribution, SALDRU's researchers continue to conduct research detailing changing patterns of well-being in South Africa and assessing the impact of government policy on the poor. Current research work falls into the following research themes: post-apartheid poverty; employment and migration dynamics; family support structures in an era of rapid social change; public works and public infrastructure programmes, financial strategies of the poor; common property resources and the poor. Key survey projects include the Langeberg Integrated Family Survey (1999), the Khayelitsha/Mitchell's Plain Survey (2000), the ongoing Cape Area Panel Study (2001-) and the Financial Diaries Project.



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