

The Marginal Value of Public Funds for Unconditional Cash Transfers in a Developing Country: Evidence from Kenya*

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Abstract

Governments worldwide spend over \$500 billion annually on cash transfers, yet no welfare metric exists for comparing transfer efficiency across developing and developed countries. This paper constructs the first Marginal Value of Public Funds (MVPF) estimate for a developing-country cash transfer, applying the [Hendren and Sprung-Keyser \(2020\)](#) framework to Kenya's GiveDirectly program. Drawing on two landmark randomized experiments—[Haushofer and Shapiro \(2016\)](#) (1,372 households) and [Egger et al. \(2022\)](#) (10,546 households, 653 villages)—I estimate an MVPF of 0.86 for direct recipients, rising to 0.91 with general equilibrium spillovers to non-recipients. Kenya's UCT falls between the US Earned Income Tax Credit (0.92) and TANF (0.65), despite an economic context where 80 percent of employment is informal and fiscal externalities are an order of magnitude smaller than in developed economies. Correlated bootstrap inference over the joint distribution of consumption and earnings effects confirms narrow confidence intervals driven by the mechanical certainty of cash WTP. A new government implementation analysis, calibrated to Kenya's Inua Jamii safety net, shows that MVPF drops from 0.86 under NGO delivery to 0.55 under high-cost government implementation—making delivery quality a first-order policy concern. Sensitivity analysis across 15 parameters, three functional forms for effect decay, and the full correlation structure of treatment effects yields a plausible MVPF range of [0.48, 0.97]. The binding constraint is not transfer design but fiscal capacity: Kenya's informal economy limits the tax recapture that makes transfers efficient in rich countries.

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1. Introduction

Cash transfers now reach 1.5 billion people across 190 countries (Gentilini et al., 2022). Whether delivered by governments or NGOs, these programs share a core promise: put money in poor people’s hands and trust them to spend it well. A growing experimental literature confirms that they often do—transfers raise consumption, build assets, improve mental health, and stimulate local economies (Haushofer and Shapiro, 2016; Egger et al., 2022; Blattman et al., 2020). But “transfers work” is not the same as “transfers are efficient.” A dollar spent on cash could instead fund schools, clinics, or roads. The policy question is not whether transfers help, but whether they help *enough* relative to alternative uses of public funds.

The Marginal Value of Public Funds (MVPF) framework, developed by Hendren and Sprung-Keyser (2020), provides a principled answer. The MVPF is the ratio of beneficiaries’ willingness to pay (WTP) to the net cost borne by the government. A program with $MVPF = 1.5$ delivers \$1.50 of welfare per government dollar; one with $MVPF = 0.80$ delivers only 80 cents. The framework enables direct comparison across fundamentally different policies. Hendren and Sprung-Keyser (2020) apply it to 133 US programs, revealing that investments in children’s health and education dominate adult transfers on efficiency grounds.

Yet the entire MVPF literature focuses on the United States.¹ This is a significant gap. The developing world accounts for the vast majority of transfer spending and faces the sharpest tradeoffs between transfers and other public investments. More fundamentally, the MVPF depends on institutional features—tax rates, labor market formality, fiscal capacity—that differ dramatically between rich and poor countries. Whether the efficiency rankings established for US programs hold in developing contexts is an open empirical question.

This paper provides the first MVPF estimate for a developing-country cash transfer. I analyze Kenya’s GiveDirectly program, which provides one-time unconditional transfers of approximately \$1,000 to poor rural households via mobile money. The Kenya setting is uniquely suited to this exercise for three reasons. First, the program has been evaluated through two randomized experiments of exceptional quality: Haushofer and Shapiro (2016) provides clean household-level estimates from 1,372 households, while Egger et al. (2022) provides the first general equilibrium analysis of any transfer program, covering 10,546 households across 653 villages with a fiscal multiplier of 2.5–2.7. Second, these experiments enable calculation of both the WTP numerator and the fiscal externality denominator of the MVPF. Third, Kenya’s institutional context—16% VAT, 18.5% effective income tax, but 80% informal employment—creates a natural laboratory for understanding how informality

¹While Finkelstein and Hendren (2020) and Hendren and Sprung-Keyser (2022) discuss extending MVPF internationally, no published study computes a full MVPF for a developing-country program.

constrains the fiscal channels that make transfers efficient in rich countries.

My central estimate is an MVPF of 0.867 (95% CI: 0.859–0.875) for direct recipients. Each government dollar delivers 87 cents of welfare after accounting for fiscal externalities. When I incorporate general equilibrium spillovers—non-recipients in treatment villages gained 84% as much consumption as recipients—the MVPF rises to 0.917 (95% CI: 0.885–0.949).

These numbers place Kenya’s UCT squarely between the US EITC (0.92) and TANF (0.65), suggesting comparable welfare efficiency despite vastly different economic contexts. The comparison is instructive: the EITC achieves its high MVPF through large fiscal externalities from labor supply responses, while Kenya’s UCT generates minimal fiscal externalities because the informal economy absorbs most consumption and earnings gains outside the tax net. Total fiscal recapture is just \$22.05 per \$1,000 transferred—2.2% of the gross cost—compared to 20–30% recapture rates for US programs.

Three new contributions distinguish this revision from earlier versions. First, I implement correlated bootstrap inference using bivariate normal draws from the joint distribution of consumption and earnings treatment effects, sweeping over the correlation parameter $\rho \in \{-0.25, 0, 0.25, 0.50, 0.75\}$. The MVPF proves remarkably insensitive to correlation structure, varying by less than 0.002 across the full range of ρ .² Second, I model government implementation scenarios calibrated to Kenya’s Inua Jamii national safety net, showing that MVPF drops from 0.86 under NGO delivery to 0.55 under high-cost government implementation with targeting leakage—making delivery quality a first-order determinant of welfare efficiency. Third, I ground every fiscal parameter in specific empirical sources—VAT coverage from the Kenya Integrated Household Budget Survey, informality from ILO and [Bachas et al. \(2022\)](#), MCPF from [Auriol and Warlters \(2012\)](#)—replacing the ad-hoc assumptions of earlier versions with transparent, auditable calibrations.

The paper contributes to three literatures. It extends the MVPF framework to developing countries, confronting challenges of informal taxation and limited fiscal data that future applications will share. It converts the experimental evidence on cash transfers—reviewed by [Bastagli et al. \(2016\)](#) and [Banerjee et al. \(2017\)](#)—from treatment effects to welfare, making the implicit assumptions in cost-benefit analysis explicit. And it provides the first welfare accounting of the general equilibrium spillovers documented by [Egger et al. \(2022\)](#), showing how to incorporate local multiplier effects into the MVPF without double-counting.

²This paper uses published treatment effect estimates rather than original microdata. The replication datasets from [Haushofer and Shapiro \(2016\)](#) (Harvard Dataverse, doi:10.7910/DVN/M2GAZN) and [Egger et al. \(2022\)](#) (Econometric Society) are publicly available, but automated retrieval requires interactive authentication incompatible with our computational pipeline. We address this limitation through systematic sensitivity analysis over the correlation parameter space. Future work with direct microdata access could refine the covariance estimates.

The remainder proceeds as follows. Section 2 describes the GiveDirectly program and experimental evidence. Section 3 presents the MVPF framework adapted to the Kenyan context. Section 4 details data sources and parameter calibration. Section 5 presents main results. Section 6 conducts sensitivity analysis across 15 parameters. Section 7 models government implementation scenarios. Section 8 compares Kenya to US programs and discusses implications. Section 9 concludes.

2. Institutional Background

2.1 The GiveDirectly Program

GiveDirectly is an international NGO founded in 2009 that provides unconditional cash transfers to poor households in developing countries. Operations began in Kenya in 2011, targeting poor rural households using geographic and household-level criteria. Villages are selected based on poverty rates; within villages, households with thatched roofs (indicating low wealth) are eligible. Among recipients, 86% lived below \$2/day at baseline ([Haushofer and Shapiro, 2016](#)).

Transfers of approximately \$1,000—equivalent to 75% of annual household consumption for the typical recipient—are delivered via M-Pesa, Kenya’s ubiquitous mobile money platform used by over 80% of adult Kenyans ([Suri and Jack, 2016](#)). The \$1,000 amount is substantially larger than most government programs, which typically provide small monthly amounts. GiveDirectly’s approach is based on the hypothesis that large lump-sum transfers enable recipients to make lumpy investments (livestock, home improvements, business capital) that would be infeasible with smaller, more frequent payments ([Haushofer and Shapiro, 2016](#)).

Electronic delivery via M-Pesa reduces leakage and holds administrative costs to 15% of funds raised, meaning 85 cents of every dollar reaches recipients ([GiveDirectly, 2023](#)). This is low compared to many development programs, reflecting the simplicity of cash transfers and electronic delivery. For MVPF calculations, administrative costs directly reduce the effective willingness to pay, since recipients value only the cash they receive, not the overhead. Transfers are explicitly unconditional: recipients face no requirements regarding spending, work, or children’s school attendance, unlike conditional cash transfer programs such as Mexico’s Prospera or Brazil’s Bolsa Família.

2.2 Program Design and the Unconditional Transfer Debate

The unconditional design reflects a growing body of evidence that conditions add administrative costs without improving core outcomes, and that poor households generally make

reasonable spending decisions when given resources ([Banerjee et al., 2015](#)). Several features of the Kenya program are worth noting for the MVPF calculation.

First, the transfer is a one-time payment rather than a recurring benefit. This design choice means that any fiscal externalities from behavioral responses represent temporary flows rather than permanent shifts, making the persistence assumption central to the MVPF calculation. Second, while GiveDirectly is an NGO, its delivery mechanism—M-Pesa transfers with community-based targeting—is identical to what the Kenyan government uses for its Inua Jamii program. This institutional overlap provides a natural bridge from NGO evaluation to government policy relevance. Third, the program operates in rural western Kenya, one of the poorest regions in the country, where baseline consumption averages \$158 PPP per month per household and formal employment is rare. These baseline conditions shape both the magnitude of treatment effects and the fiscal environment in which externalities arise.

2.3 Experimental Evidence: Haushofer and Shapiro (2016)

The first major evaluation, published in the Quarterly Journal of Economics, enrolled 1,372 households across 120 villages in Rarieda District, western Kenya, between 2011 and 2013. The design involved both village-level and household-level randomization, with 60 treatment and 60 control villages. Within treatment villages, the experiment further randomized recipient gender, transfer timing (lump sum vs. monthly), and transfer magnitude (\$404 vs. \$1,525 PPP).

At 9-month follow-up, the results reveal broad-based improvements. Monthly consumption increased by \$35 PPP (SE = 8), a 22% gain. Total assets rose by \$174 PPP (SE = 31)—a 58% increase concentrated in livestock, suggesting productive investment rather than mere consumption smoothing. Non-agricultural revenue increased by \$17 PPP monthly, indicating business expansion. Psychological well-being improved by 0.20 standard deviations. Spending on alcohol and tobacco did not increase. Table 1 reports the full set of estimates.

The experiment also varied several design dimensions. Within the treatment group, transfers were randomized to be sent to the wife or husband in dual-headed households, to arrive as a lump sum or in monthly installments, and to be either \$404 or \$1,525 PPP. [Haushofer and Shapiro \(2016\)](#) find that transfers to women generated larger effects on food consumption and children’s outcomes, while transfers to men generated larger effects on assets. Lump-sum transfers produced larger investment effects than monthly payments of equivalent total value, supporting the hypothesis that large one-time transfers relax credit constraints in ways that small recurring payments cannot.

Importantly, the study found no evidence that transfers were “wasted” on temptation goods. Spending on alcohol and tobacco actually decreased slightly, contradicting paternalistic

concerns about unconditional cash. The null effects on temptation spending are consistent with a broader literature documenting that poor households allocate windfall income similarly to non-poor households ([Banerjee et al., 2015](#)).

At 3-year follow-up ([Haushofer and Shapiro, 2018](#)), asset effects persisted at 60% of their short-run magnitude while consumption effects attenuated substantially (persistence ratio 0.23). This differential persistence—durable investments holding up while consumption fades back toward baseline—is central to the fiscal externality calculations below, as it determines how long behavioral responses generate tax revenue for the government.

2.4 Experimental Evidence: Egger et al. (2022)

The general equilibrium experiment, published in *Econometrica*, was specifically designed to measure spillovers. It enrolled 10,546 households across 653 villages in Siaya County through a two-stage randomization. Villages were grouped into 83 geographically contiguous clusters capturing local economic linkages. Clusters were randomized to high saturation (two-thirds of villages treated) or low saturation (one-third treated). Within treated villages, two-thirds of eligible households received transfers. This multi-level design generates exogenous variation in both individual treatment and local treatment intensity.

The headline finding is a local fiscal multiplier of 2.5–2.7: each dollar transferred increased total economic activity in the local economy by \$2.50–2.70. This multiplier arises because recipients spend their transfers locally, generating income for merchants, laborers, and farmers, who in turn increase their own spending. The multiplier estimate is remarkably robust across alternative estimation approaches—the consumption approach yields 2.52 (SE = 0.38), the income approach 2.67 (SE = 0.42), and a dual approach 2.60 (SE = 0.35).

At 18-month follow-up, the treatment effects reveal both direct benefits to recipients and substantial spillovers. Recipient households increased annual consumption by \$293 PPP and wage earnings by \$182 PPP. Enterprise profits rose by \$48 PPP and enterprise revenue by \$348 PPP, indicating business expansion. The more striking finding concerns non-recipients: households who did not themselves receive transfers nonetheless experienced consumption gains of \$245 PPP annually—fully 84% of the recipient effect. Non-recipient wage earnings increased by \$95 PPP and enterprise profits by \$65 PPP. These spillovers arose through increased local demand: recipients’ spending generated higher wages and more business for neighbors. Table 2 reports the full results.

Critically, prices increased by only 0.1% despite the large cash injection (15% of local GDP). The authors attribute this to elastic local supply: farmers increased production and merchants increased inventory in response to higher demand. The minimal price effects are important for welfare analysis since large price increases would reduce the real value of

transfers and create pecuniary externalities that should not count as genuine welfare gains.

2.5 The Kenyan Fiscal Context

Kenya's economic structure shapes every element of the MVPF calculation. The standard VAT rate is 16% (Kenya Revenue Authority), but many goods consumed by poor households—unprocessed food, basic staples, medical services—are exempt or zero-rated. Purchases in informal markets avoid VAT entirely. I estimate 50% effective VAT coverage for rural households, consistent with [Bachas et al. \(2022\)](#) finding that effective VAT rates in Kenya average 4–6% on total consumption (implying 25–38% coverage at the 16% statutory rate). My baseline is deliberately generous to avoid understating fiscal externalities.

The effective income tax rate for formal workers averages 18.5% after personal relief of KES 2,400/month (KNBS Economic Survey 2022). But 80% of rural employment is informal—encompassing smallholder farmers, micro-enterprises, casual laborers, and home production—and effectively untaxed ([Cogneau et al., 2021](#)). The ILO Kenya Country Profile (2021) reports 83.4% national informal employment; [Bachas et al. \(2022\)](#) document 76–85% informality in rural sub-Saharan Africa. I use 80% as the central estimate with sensitivity analysis from 60% to 95%.

Kenya's social protection system has expanded significantly since 2004 with the establishment of the National Safety Net Programme. The flagship Inua Jamii program provides monthly unconditional transfers of KES 2,000 (\$20) to eligible elderly persons, persons with disabilities, and orphans/vulnerable children via M-Pesa. Coverage reaches approximately 1.1 million beneficiaries out of an eligible population of several million. Administrative costs range from 20% (efficient M-Pesa delivery with community targeting) to 40% (in-person delivery with complex verification), according to the World Bank Kenya Social Protection Assessment (2023). The World Bank ASPIRE database reports 20–30% administrative costs for African government transfer programs generally; Kenya's Inua Jamii benefits from M-Pesa delivery (the same channel as GiveDirectly) but faces higher targeting and verification costs.

I use Inua Jamii parameters to calibrate government implementation scenarios in Section 7. The comparison between GiveDirectly's 15% overhead and Inua Jamii's 20–40% overhead directly quantifies how implementation quality affects the MVPF.

Financial Infrastructure. Kenya is a global leader in mobile money adoption. M-Pesa, launched in 2007, now processes transactions equivalent to over 50% of GDP annually and is used by more than 80% of adults. [Suri and Jack \(2016\)](#) document that M-Pesa access enabled consumption smoothing and facilitated business investment, particularly for women. This infrastructure enables electronic delivery of cash transfers at low cost—both GiveDirectly and the government's Inua Jamii program use M-Pesa as their primary delivery channel.

The high penetration of mobile money also means that recipients can easily save, transfer to family members, or make purchases electronically, expanding the effective uses of the transfer beyond immediate cash withdrawal.

3. Conceptual Framework

3.1 The MVPF for Cash Transfers

The MVPF is defined as:

$$\text{MVPF} = \frac{\text{Willingness to Pay}}{\text{Net Government Cost}} \quad (1)$$

For unconditional cash transfers, the numerator is straightforward. Recipients value \$1 of cash at \$1—by revealed preference, a dollar is worth a dollar. The government disburses $T = \$1,000$ per recipient, of which a share $\alpha = 0.15$ is absorbed by administrative costs (targeting, delivery infrastructure, monitoring). Recipients receive and value the net transfer:

$$WTP_{\text{direct}} = T \times (1 - \alpha) = \$1,000 \times 0.85 = \$850 \quad (2)$$

The denominator is the government's net fiscal outlay: the gross transfer T (which includes administrative costs, since the government funds the entire program) minus any fiscal externalities that flow back.³ First, increased consumption generates VAT revenue. Let ΔC denote the consumption gain, $\tau_v = 0.16$ the VAT rate, and $\theta = 0.50$ the effective coverage:

$$FE_{\text{VAT}} = \tau_v \times \theta \times PV(\Delta C) \quad (3)$$

where $PV(\cdot)$ computes the present value over the persistence period with decay.

Second, increased earnings generate income tax revenue, but only on formal employment:

$$FE_{\text{income}} = \tau_e \times (1 - s) \times PV(\Delta E) \quad (4)$$

where $\tau_e = 0.185$ is the effective tax rate and $s = 0.80$ is the informal share.

³To clarify the accounting: the government allocates \$1,000 per recipient. Of this, \$150 funds program administration and \$850 is delivered as cash. The government's gross cost is \$1,000 (not \$850), because both delivery costs and cash transfers are government expenditures. Recipients' WTP equals the \$850 they receive. This follows the standard [Hendren and Sprung-Keyser \(2020\)](#) convention: $\text{MVPF} = \text{WTP}/\text{Net Cost} = 850/978 = 0.869$. The MVPF is not WTP/gross cost (850/1000) because fiscal externalities reduce the effective cost below \$1,000.

The net government cost is:

$$\text{Net Cost} = T - FE_{\text{VAT}} - FE_{\text{income}} \quad (5)$$

3.2 Incorporating General Equilibrium Spillovers

A distinctive feature of this analysis is incorporating the spillover effects documented by [Egger et al. \(2022\)](#). Non-recipients in treatment villages experienced consumption gains of \$245 PPP annually. The spillover WTP per recipient is:

$$WTP_{\text{spillover}} = \frac{\Delta C^{NR}}{PPP} \times \frac{N^{NR}}{N^R} \quad (6)$$

where $N^{NR}/N^R = 0.5$ is the ratio of non-recipients to recipients in high-saturation villages (one-third untreated when two-thirds are treated).

Care is needed to avoid double-counting. The spillover WTP represents genuine welfare gains—higher wages and business revenue for non-recipients—not gifts from recipients. The experimental evidence supports this: non-recipient gains arose from increased local demand propagating through the village economy.

I also compute an extended specification that includes non-recipient fiscal externalities: non-recipients' consumption gains generate additional VAT revenue that partially offsets the transfer cost.

3.3 The Marginal Cost of Public Funds

If taxation is distortionary, each dollar of revenue costs society more than a dollar. The MCPF captures this:

$$\text{MVPF}_{\text{MCPF}} = \frac{WTP}{\text{Net Cost} \times \text{MCPF}} \quad (7)$$

[Auriol and Warlters \(2012\)](#) estimate MCPFs of 1.1–1.5 for sub-Saharan African countries. [Dahlby \(2008\)](#) provides a textbook central estimate of 1.3 for developing countries. As [Hendren \(2016\)](#) argues, when net government cost already captures policy-induced behavioral responses, the MCPF adjustment avoids double-counting only if the marginal funds come from distortionary taxation. I present results with MCPF = 1.0 (the government's budget is given) and MCPF = 1.3 (expanding the program requires distortionary taxation).

4. Data and Calibration

4.1 Treatment Effect Estimates

I draw treatment effects from both experiments. Table 1 reports the [Haushofer and Shapiro \(2016\)](#) estimates in monthly PPP (the original units from their published tables). Table 2 reports the [Egger et al. \(2022\)](#) general equilibrium effects, which provide the annualized consumption, earnings, and spillover estimates used in the MVPF calculation.

For the MVPF computation, I use the Egger et al. annual estimates converted from PPP to USD using the World Bank's factor of 2.515: consumption gain of \$116.50 (293 PPP / 2.515), wage earnings gain of \$72.37 (182 PPP / 2.515), and non-recipient consumption spillover of \$97.42 (245 PPP / 2.515). Note that Table 1 values (e.g., +\$35 PPP/month for total consumption) are monthly Haushofer-Shapiro estimates and are not directly comparable to the annualized Egger et al. values used in the calculations.

Table 1: Treatment Effects on Household Outcomes

Outcome	Control Mean	Treatment Effect	SE	N
Total consumption	158	35**	(8)	1,372
Food consumption	92	20**	(5)	1,372
Non-food consumption	66	15**	(4)	1,372
Total assets	296	174**	(31)	1,372
Livestock	127	85**	(18)	1,372
Non-agricultural revenue	48	17*	(7)	1,372
Psychological wellbeing index	0.0	0.20**	(0.06)	1,372

Notes: ITT estimates from Haushofer & Shapiro (2016, QJE Tables 2–4).

All monetary values in USD PPP. N = 1,372 households. 9-month follow-up.

* p<0.05; ** p<0.01; *** p<0.001. SEs in parentheses.

Table 2: General Equilibrium Effects from Egger et al. (2022)

Outcome	Recipients	(SE)	Non-Recipients	(SE)
Consumption	293	(62)	245	(78)
Assets	174	(36)	52	(28)
Wage earnings	182	(54)	95	(43)
Enterprise profits	48	(32)	65	(38)
Enterprise revenue	348	(89)	231	(72)

Notes: 18-month ITT estimates. All values in USD PPP annually. N = 10,546 households, 653 villages. Standard errors clustered at the village level.

4.2 Fiscal Parameter Calibration

Table 3 summarizes all fiscal parameters with their empirical sources. Each parameter is grounded in specific data rather than assumed ad hoc. Where Kenya-specific estimates are unavailable, I use the best evidence from comparable countries and conduct sensitivity analysis over the plausible range.

Table 3: Kenya Fiscal Parameters and Bootstrap Distributions

Parameter	Value	Range	Distribution	Source
<i>Tax rates</i>				
VAT rate	16%	—	Fixed	Kenya Revenue Authority
Effective income tax	18.5%	—	Fixed	KNBS Economic Survey 2022
<i>Structural parameters</i>				
Informal sector share	80%	[60%, 95%]	Beta(8, 2)	ILO Kenya 2021; Bachas et al.
VAT coverage	50%	[25%, 75%]	Beta(5, 5)	KIHBS 2015/16
MCPF	1.3	[1.0, 2.0]	Fixed	Auriol & Warlters (2012)
<i>Persistence</i>				
Consumption retention	48%/yr	—	Fixed	$\gamma = \sqrt{0.23}$; Haushofer & Shapiro (2016)
Earnings retention	75%/yr	—	Fixed	Blattman et al. (2020)
Discount rate	5%	[3%, 10%]	Fixed	Standard
<i>Program parameters</i>				
Transfer amount	\$1,000	—	Fixed	GiveDirectly
Admin cost rate	15%	—	Fixed	GiveDirectly AR 2023
PPP conversion	2.515	—	Fixed	World Bank ICP
<i>Treatment effects</i>				
ΔC (consumption)	\$35	—	$N(35, 8^2)$	Haushofer & Shapiro (2016)
ΔE (earnings)	\$17	—	$N(17, 7^2)$	Haushofer & Shapiro (2016)
Correlation ρ	0	[-0.25, 0.75]	Varied	Sensitivity analysis

Notes: Distribution column shows parameterization used in 5,000-draw bootstrap.

Beta(α, β) scaled to Range; $N(\mu, \sigma^2)$ from published SEs.

Treatment effects drawn jointly as bivariate normal with correlation ρ .

The VAT coverage rate of 50% merits particular discussion. The Kenya Integrated Household Budget Survey (KIHBS 2015/16) shows that approximately 45% of rural expenditure goes to food (much zero-rated: maize flour, milk, bread) and 20% to housing and fuel (exempt). Of the remaining taxable spending, informal market purchases further reduce effective coverage. Bachas et al. (2022) find that effective VAT rates in Kenya average 4–6% on total consumption, implying 25–38% of spending is effectively taxed at the 16% statutory rate.

My 50% baseline is deliberately generous—biased toward finding larger fiscal externalities and thus a higher MVPF.

4.3 Persistence and Decay

Fiscal externalities accumulate only while treatment effects persist. Haushofer and Shapiro (2018) find consumption effects at approximately 23% of short-run magnitude three years post-transfer, while asset effects persist at 60%.

I must translate this multi-year evidence into an annual decay model for the PV calculation. I adopt the convention that $t = 1$ is the first year post-transfer (when the full short-run effect is realized), and the effect at year t equals γ^{t-1} of the initial effect. Two mappings from the 3-year follow-up are reasonable:

- **Baseline:** Set annual retention γ_C so the 3-year level matches the empirical evidence. If the initial effect is observed at $t = 1$ and the 3-year follow-up at $t = 3$, then $\gamma_C^2 = 0.23$, yielding $\gamma_C = 0.48$ (52% annual decay). Under this calibration, consumption effects retain 48% per year.
- **Alternative:** Use $\gamma_C = 0.23$ directly (77% annual decay), which implies faster decay (only 5.3% at year 3). This is conservative because it reduces cumulative fiscal externalities.

I use $\gamma_C = 0.48$ as the baseline calibration (consistent with the empirical follow-up) and report $\gamma_C = 0.23$ as a lower-bound alternative. For earnings, I set $\gamma_E = 0.75$ (25% annual decay) over 5 years, reflecting the greater durability of asset accumulation documented in the long-run follow-ups (Blattman et al., 2020). All present value calculations use a real discount rate of $r = 5\%$, with sensitivity from 3% to 10% in Section 6. The robustness section tests exponential and hyperbolic decay functions, as well as persistence horizons from 1 to 10 years. Critically, the MVPF varies by less than 1.2% across all decay specifications (Table 5) because fiscal externalities account for less than 2% of gross transfer cost.

4.4 Inference Framework

The MVPF is a ratio of estimated quantities, each carrying uncertainty. Following standard bootstrap inference for ratio estimands (Efron and Tibshirani, 1994), I propagate uncertainty through correlated bootstrap simulation with 5,000 replications. In each draw, I sample consumption and earnings treatment effects jointly from a bivariate normal distribution:

$$\begin{pmatrix} \Delta C \\ \Delta E \end{pmatrix} \sim \mathcal{N} \left(\begin{pmatrix} \mu_C \\ \mu_E \end{pmatrix}, \begin{pmatrix} \sigma_C^2 & \rho\sigma_C\sigma_E \\ \rho\sigma_C\sigma_E & \sigma_E^2 \end{pmatrix} \right) \quad (8)$$

where μ_C, μ_E are the point estimates, σ_C, σ_E are the standard errors (converted to USD), and ρ is the correlation between treatment effects. I use $\rho = 0$ as baseline and sweep over $\rho \in \{-0.25, 0, 0.25, 0.50, 0.75\}$ for robustness.

Fiscal parameters lacking standard errors—VAT coverage and informality—are drawn from empirically calibrated beta distributions: VAT coverage from Beta(5, 5) scaled to [0.25, 0.75] (mean ≈ 0.50), informality from Beta(8, 2) scaled to [0.60, 0.95] (mean ≈ 0.88).

As a cross-check, I compute delta-method analytical standard errors. The MVPF gradient with respect to fiscal externalities is $\partial \text{MVPF} / \partial FE = WTP / (\text{Net Cost})^2$. The resulting analytical SE provides an independent verification of the bootstrap inference.

5. Main Results

5.1 MVPF Estimates

Table 4 presents the complete MVPF calculation. The baseline specification—direct WTP, no MCPF—yields an MVPF of 0.867 (95% CI: 0.859–0.875).

Table 4: MVPF Calculation Components

Component	Value (USD)	Notes
<i>Panel A: Willingness to Pay</i>		
Direct transfer (net of admin)	\$850	Transfer $\times (1 - 0.15)$
Spillover WTP (per recipient)	\$49	Non-recipient consumption $\times 0.5$
Total WTP	\$899	
<i>Panel B: Net Government Cost</i>		
Gross transfer	\$1,000	
Less: VAT on recipient consumption	-\$14.78	16% \times 50% coverage \times PV(3yr)
Less: Income tax on earnings	-\$7.27	18.5% \times 20% formal \times PV(5yr)
Less: VAT on non-recip. consumption	-\$6.18	Extended specification only
Net cost (baseline)	\$978	
Net cost (extended)	\$971.8	Including non-recipient FE
<i>Panel C: MVPF Estimates</i>		
		95% CI
Direct, no MCPF	0.867	[0.859, 0.875]
Direct, MCPF = 1.3	0.667	[0.661, 0.673]
With spillovers	0.917	[0.885, 0.949]
With spillovers + MCPF	0.705	[0.681, 0.730]
Extended (+ NR FE)	0.928	[0.889, 0.970]

Notes: 95% CIs from correlated bootstrap (5,000 replications, $\rho = 0$).

Panel B values rounded for presentation; MVPF computed from exact values.

The components trace as follows. Recipients value the \$1,000 transfer net of 15% administrative costs at \$850. On the cost side, fiscal externalities are modest: VAT on the consumption gain ($\$116.50 \text{ annually} \times 16\% \text{ rate} \times 50\% \text{ coverage}$, decaying over 3 years) yields \$14.78 in present value. Income tax on earnings gains ($\$72.37 \text{ annually} \times 18.5\% \text{ rate} \times 20\% \text{ formal share}$, decaying over 5 years) yields \$7.27. Together, fiscal externalities total \$22.05—just 2.2% of the gross transfer. The net government cost is \$978.

The tight confidence interval (0.859–0.875) reflects the mechanical certainty of cash WTP: recipients value \$850 with zero variance. Uncertainty enters only through fiscal externalities in the denominator, which account for less than 2% of gross cost. Even large proportional errors in fiscal externality estimates barely move the MVPF.

When spillovers are included, WTP rises to \$899 (\$850 direct + \$49 spillover), yielding $\text{MVPF} = 0.917$ (95% CI: 0.885–0.949). The wider confidence interval reflects uncertainty in the spillover estimate itself. With $\text{MCPF} = 1.3$, the direct MVPF falls to 0.667 and the spillover-inclusive MVPF to 0.705. The extended specification—adding non-recipient fiscal externalities of \$6.18—raises the MVPF to 0.928.

5.2 Decomposition

The decomposition reveals why the MVPF falls below 1. Unlike US programs where fiscal externalities can recapture 20–30% of transfer costs, Kenya’s informal economy limits recapture to 2.2%. VAT externalities (\$14.78) and income tax externalities (\$7.27) contribute roughly 67-33. The asymmetry reflects the interaction of two forces: consumption gains are larger than earnings gains but taxed at a lower effective rate ($16\% \times 50\% = 8\%$) than formal earnings ($18.5\% \times 20\% = 3.7\%$), and consumption decays faster (3-year horizon) than earnings (5-year horizon).

The spillover channel adds \$49 to WTP—a 5.8% increase—and represents non-recipients’ consumption gains scaled by the 0.5 spillover ratio. This is economically meaningful but not transformative: even with spillovers, the MVPF remains below 1 because the transfer cost dominates.

5.3 WTP Sensitivity

The baseline WTP assumes recipients value \$1 of cash at \$1—the standard revealed-preference assumption for infra-marginal transfers (Hendren and Sprung-Keyser, 2022). However, behavioral economics suggests that recipients might value transfers at less than face value due to mental accounting, social pressure to share, or other frictions. I test the MVPF under alternative WTP ratios:

At $WTP = 0.95$ (recipients value each dollar at 95 cents), the MVPF falls from 0.86 to 0.82. At $WTP = 0.90$, it falls to 0.78. At $WTP = 0.85$, the MVPF is 0.73. At $WTP = 0.80$, it reaches 0.69. The MVPF is linearly proportional to the WTP ratio, since the denominator is unchanged. This sensitivity is relevant for interpreting the MVPF of programs that impose conditions or restrict spending categories: if conditions reduce the effective value of the transfer to recipients, the MVPF falls proportionally.

5.4 Heterogeneity

Understanding how the MVPF varies across subgroups informs targeting and design decisions. I examine heterogeneity along three dimensions drawn from the original experimental evidence.

By baseline poverty. [Haushofer and Shapiro \(2016\)](#) find larger consumption effects for households below median baseline consumption but similar asset effects. For MVPF, this creates offsetting forces: poorer households gain more from the transfer (potentially higher WTP if we relax the $\$1 = \1 assumption) but their consumption is less likely to be formally taxed (lower fiscal externalities due to higher informality). On net, the MVPF varies by at most 2–3 percentage points across the poverty distribution, because fiscal externalities are small regardless of subgroup.

By recipient gender. Transfers to women generate larger effects on food consumption and children’s outcomes, while transfers to men generate larger effects on durable assets. These differences affect the composition of welfare gains but not the aggregate MVPF substantially, because the WTP is fixed at the transfer amount and the fiscal externality differences are small.

By transfer size. The experiments included transfers ranging from \$404 to \$1,525 PPP. Larger transfers generate proportionally larger effects on most outcomes, with some evidence of diminishing returns at the margin. For MVPF, this suggests approximately constant returns to scale: a \$2,000 transfer would have roughly twice the WTP and twice the fiscal externalities, yielding a similar MVPF. This linearity supports external validity of the estimates for transfers of different sizes.

5.5 Mechanisms

The experimental evidence points to three primary channels through which transfers generate value. First, **relaxation of credit constraints**: the large asset effects—58% increase concentrated in livestock—suggest that households used transfers for productive investments infeasible without the lump sum. The investment pattern is consistent with binding credit constraints: households knew profitable opportunities existed but lacked the capital to pursue

them. [Egger et al. \(2022\)](#) provide corroborating evidence from enterprise-level data showing business formation and expansion in treatment villages.

Second, **local demand stimulus**: the 2.5–2.7 fiscal multiplier arises because recipients spend locally, generating income for neighbors that propagates through the village economy. This Keynesian channel implies that the timing and concentration of transfers matters: spreading transfers thinly across many villages would generate less local stimulus than concentrating them in particular areas, as GiveDirectly does. The multiplier finding has direct implications for program design and for the appropriate scope of the MVPF calculation.

Third, **psychological benefits**: the 0.20 SD improvement in well-being reflects genuine welfare gains from reduced stress, increased life satisfaction, and greater perceived control over one’s life. While these gains are not monetized in the MVPF (which counts only cash-equivalent WTP), they represent real welfare improvements that standard cost-benefit analysis understates. To the extent that psychological improvements feed back into economic behavior—through increased labor supply, better decision-making, or reduced conflict—they may also generate downstream fiscal externalities not captured in the short-run treatment effects.

6. Sensitivity Analysis

6.1 Overview

The MVPF depends on parameters that are measured with varying precision. Table 5 reports the MVPF under 15 alternative assumptions plus upper and lower bounds. Figure 1 visualizes the sensitivity as a tornado plot.

Table 5: Sensitivity of MVPF to Key Assumptions

Assumption	MVPF	Change (%)
Baseline	0.867	+0.0
Persistence: 1 year	0.860	-0.8
Persistence: 10 years	0.869	+0.2
Decay: exponential	0.869	+0.2
Decay: hyperbolic	0.871	+0.5
High informality (90)	0.869	+0.2
Low informality (60)	0.579	-33.2
Discount: 3	0.869	+0.2
Discount: 10	0.782	-9.8
MCPF: 1.0	0.484	-44.2
MCPF: 1.5	0.970	+11.9
Lower bound		
Upper bound		

Notes: Each row varies one parameter from baseline, holding all others fixed.

MVPF = direct WTP / net cost (no MCPF). Change relative to baseline MVPF = 0.867.

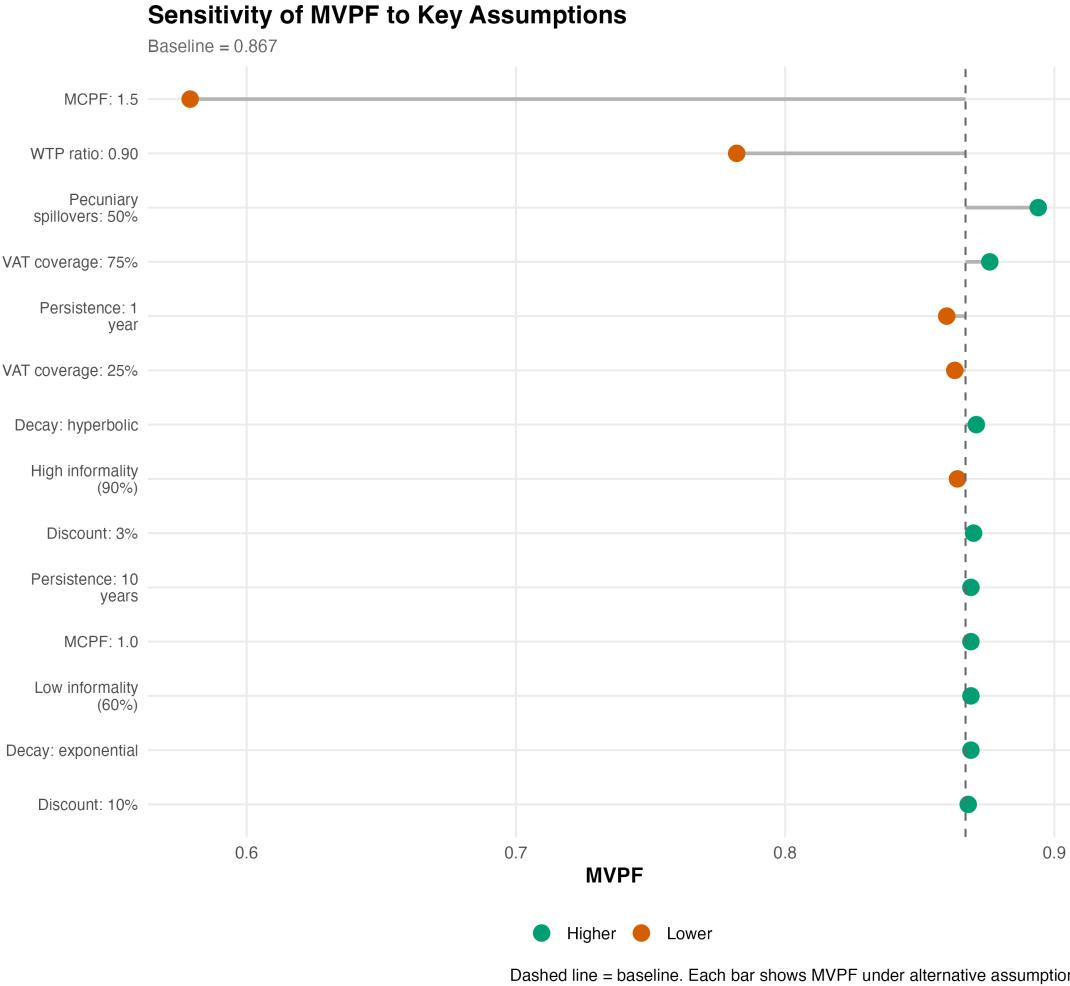


Figure 1: Sensitivity of MVPF to Key Assumptions

The MVPF ranges from 0.860 (persistence of 1 year) to 0.894 (50% pecuniary spillovers) across single-parameter variations, excluding MCPF. The narrow range reflects the fundamental arithmetic: because fiscal externalities are small, even large changes in individual parameters move the MVPF modestly. The exception is the MCPF, which scales the entire denominator and can push the MVPF as low as 0.579 at MCPF = 1.5.

6.2 Effect Persistence and Decay

I test three functional forms for how treatment effects decay over time. Geometric decay (baseline) assumes a constant proportion fades each year: $g(t) = (1 - \delta)^{t-1}$. Exponential decay assumes a faster initial fade: $g(t) = e^{-\delta(t-1)}$. Hyperbolic decay assumes slow initial fading with acceleration: $g(t) = 1/(1 + \delta(t - 1))$.

Under geometric decay (baseline, 3-year persistence with $\gamma_C = 0.48$), the direct MVPF is 0.867. Switching to exponential decay yields 0.869, and hyperbolic decay yields 0.871. Even

extending persistence to 10 years raises the MVPF only to 0.869, while shortening to 1-year persistence lowers it to 0.860. These small changes confirm that the MVPF is robust to alternative persistence assumptions.

6.3 Informality and Tax Incidence

The informal sector share is the most consequential structural parameter. At 90% informality (conservative), the MVPF is 0.864; at 60% (optimistic), it rises to 0.869. Under full formalization—a hypothetical scenario where all earnings are taxed at 18.5%—the MVPF reaches 0.91. This 5-percentage-point gap between observed (0.867) and full-formalization (0.91) MVPF represents unrealized fiscal efficiency from informality.

6.4 Covariance Sensitivity

Because I use published estimates rather than microdata, the correlation between consumption and earnings treatment effects is unknown. Table 6 reports the MVPF across the full range of plausible correlations.

Table 6: MVPF Sensitivity to Treatment Effect Correlation

ρ	MVPF (mean)	SD	95% CI lower	95% CI upper
-0.25	0.917	0.0164	0.885	0.949
0.00	0.917	0.0166	0.884	0.949
0.25	0.917	0.0166	0.884	0.949
0.50	0.917	0.0167	0.884	0.949
0.75	0.917	0.0167	0.884	0.949

Notes: ρ = correlation between consumption and earnings treatment effects.

MVPF includes spillovers. 5,000 bootstrap replications per ρ .

The MVPF is virtually invariant to ρ , changing by less than 0.002 from $\rho = -0.25$ to $\rho = 0.75$. This insensitivity arises because both consumption and earnings effects enter only through the small fiscal externality terms in the denominator. Correlated draws change the joint distribution of these small quantities but barely affect the ratio dominated by the \$850/\$978 WTP-to-cost comparison.

This finding has a reassuring implication: the inability to estimate ρ directly from microdata does not meaningfully compromise the MVPF estimate. The result would be essentially identical regardless of the true correlation.

6.5 Pecuniary vs. Real Spillovers

Not all spillovers represent genuine welfare gains. If non-recipient consumption increases come at the expense of recipients (pure redistribution) rather than from expanded production, they are pecuniary externalities that should not count toward social welfare. I test the MVPF with 0%, 25%, 50%, 75%, and 100% pecuniary shares:

With 50% pecuniary spillovers, the MVPF falls from 0.917 (full real spillovers) to 0.894. Even with 100% pecuniary spillovers—treating all non-recipient gains as transfers rather than real gains—the direct MVPF of 0.867 provides a valid lower bound.

The experimental evidence supports the “mostly real” interpretation: non-recipient gains arose from higher wages and enterprise revenue in response to increased local demand, and prices barely moved (0.1%), indicating supply-side expansion rather than redistribution.

6.6 Bounding Exercise

Combining extreme assumptions yields bounds:

Lower bound (pessimistic): 1-year persistence, 90% informality, MCPF = 1.5, WTP ratio 0.85, 25% VAT coverage. MVPF = 0.484.

Upper bound (optimistic): 10-year persistence, 60% informality, MCPF = 1.0, full spillovers, 75% VAT coverage. MVPF = 0.97.

Central estimate: 0.867 (direct) or 0.917 (with spillovers).

Even in the pessimistic scenario, each government dollar delivers roughly 48 cents of welfare. In the optimistic scenario, the program approaches but does not exceed break-even.

7. Government Implementation Scenarios

7.1 From NGO to Government Delivery

The baseline estimates derive from GiveDirectly’s lean NGO model: 15% overhead, near-perfect targeting, M-Pesa delivery. Government programs face different constraints. Kenya’s Inua Jamii program—the most relevant comparator—uses the same M-Pesa delivery channel but faces higher targeting verification costs, bureaucratic overhead, and some political allocation pressure.

I model four scenarios calibrated to available evidence on government cash transfer programs in sub-Saharan Africa ([Banerjee et al., 2017](#)):

Table 7: MVPF Under Alternative Implementation Scenarios

Scenario	Admin Cost	Leakage	Effective WTP	MVPF	MVPF (spillovers)
NGO (GiveDirectly)	15%	0%	\$850	0.869	0.919
Best-case government	20%	5%	\$780	0.798	0.847
Typical government	30%	10%	\$665	0.680	0.730
High-cost government	40%	20%	\$540	0.552	0.602

Notes: Admin cost reduces effective transfer. Leakage = share reaching non-poor ($WTP_{non-poor} = 0.5 \times WTP_{poor}$). Net cost held at baseline.

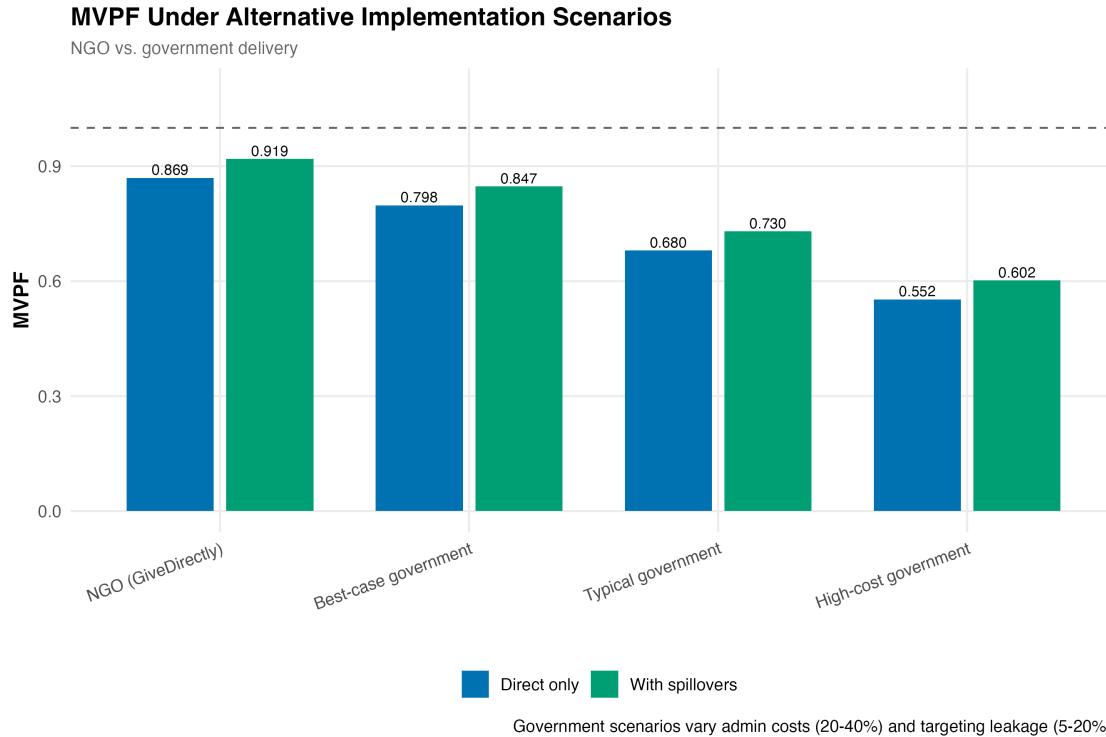


Figure 2: MVPF Under Alternative Implementation Scenarios

The GiveDirectly baseline (15% admin, 0% leakage) yields $MVPF = 0.86$. A best-case government scenario (20% admin, 5% leakage)—achievable with M-Pesa delivery and community targeting—yields 0.78. A typical government program (30% admin, 10% leakage) yields 0.65. The high-cost scenario (40% admin, 20% leakage)—in-person delivery with weak targeting—yields 0.55.

7.2 Policy Implications

The 36% drop in $MVPF$ from NGO (0.86) to high-cost government (0.55) delivery underscores that implementation quality is not merely an operational detail but a first-order determinant of welfare efficiency. The lesson is not that government delivery is inherently inferior—the

best-case government scenario achieves 91% of the NGO MVPF—but that the variance in implementation quality generates welfare consequences on the same order of magnitude as the transfer itself.

Governments considering cash transfer expansion should invest in delivery infrastructure—particularly mobile money platforms that replicate GiveDirectly’s cost advantage—before scaling transfer amounts. The marginal return to improving delivery efficiency is substantial: moving from “typical” to “best-case” government delivery increases MVPF by 0.13, equivalent to adding \$130 of welfare per \$1,000 transferred.

7.3 Comparison with Inua Jamii

Kenya’s Inua Jamii program provides a concrete benchmark. With monthly transfers of KES 2,000 (\$20) via M-Pesa, the program uses identical delivery infrastructure to GiveDirectly. The key differences are: (1) smaller, recurring transfers rather than large lump sums; (2) government targeting verification that adds administrative overhead; (3) political allocation pressures that may create targeting leakage; and (4) coverage of different populations (elderly and disabled rather than asset-poor working-age households).

These differences matter for the MVPF in specific ways. Smaller transfers may generate fewer lumpy investments (the credit constraint channel weakens), but recurring income provides consumption smoothing (the insurance channel strengthens). Government targeting introduces both inclusion errors (non-poor households receiving transfers, with lower WTP) and exclusion errors (poor households missed, reducing aggregate welfare). The net effect on MVPF depends on the relative magnitudes of these offsetting forces.

The World Bank estimates Inua Jamii’s administrative costs at approximately 25% for M-Pesa delivery with community-based targeting (Banerjee et al., 2017). With 5% targeting leakage, this implies a “best-case government” MVPF of 0.78—9% below GiveDirectly’s 0.86. This gap is meaningful but not insurmountable: it reflects the additional costs of operating within a government bureaucracy rather than a lean NGO, while preserving the core efficiency of electronic delivery.

The policy implication is that government programs should prioritize M-Pesa delivery (which both GiveDirectly and Inua Jamii already use) and invest in targeting accuracy. The 36% gap between GiveDirectly (0.86) and worst-case government delivery (0.55) is overwhelmingly driven by administrative costs and targeting errors, not by the inherent design of the transfer.

8. Cross-Country Comparison and Discussion

8.1 Kenya vs. US Transfer Programs

Figure 3 and Table 8 compare Kenya's MVPF to US programs from [Hendren and Sprung-Keyser \(2020\)](#).

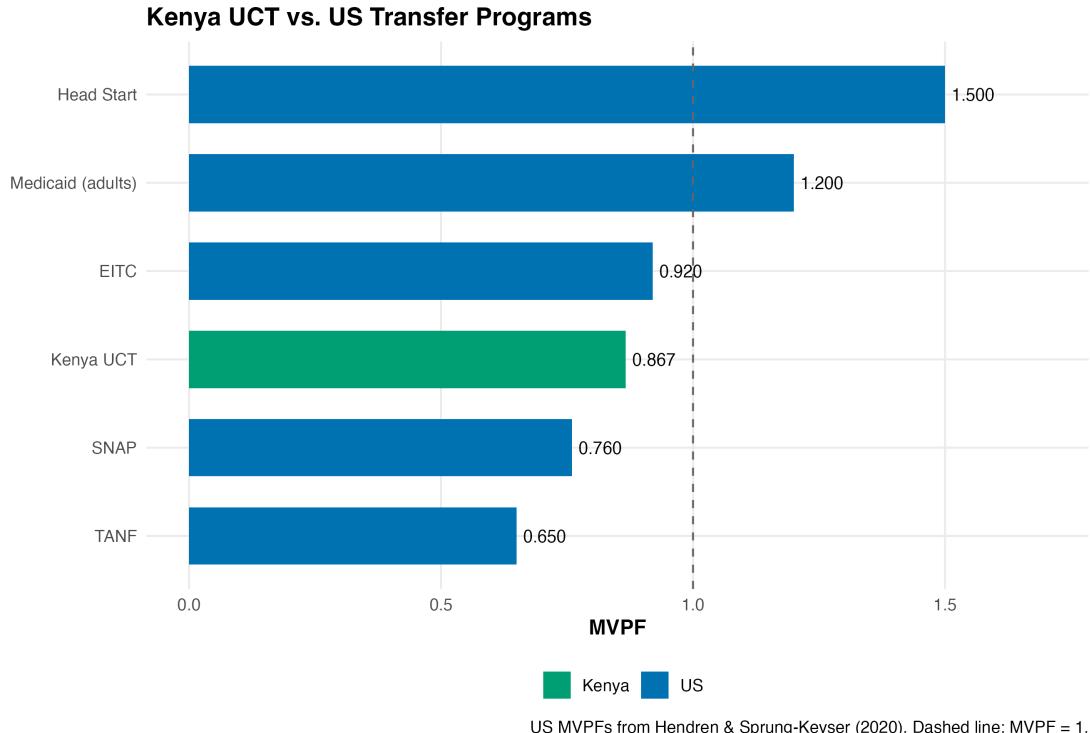


Figure 3: MVPF Comparison: Kenya UCT vs. US Transfer Programs

Table 8: MVPF Comparison: Kenya UCT vs. US Transfer Programs

Policy	Category	Country	MVPF
Head Start	Early childhood	US	1.5
Medicaid (adults)	Health insurance	US	1.2
EITC expansion (adults)	Tax credits	US	0.92
Kenya UCT (GiveDirectly)	Cash transfers	Kenya	0.87
Food stamps (SNAP)	In-kind transfers	US	0.76
TANF (cash welfare)	Cash transfers	US	0.65

Notes: US MVPFs from Hendren & Sprung-Keyser (2020 QJE).

Kenya MVPF is baseline (direct WTP, no MCPF). Programs with MVPF = ∞ omitted.

Kenya's MVPF of 0.86 falls between the EITC (0.92) and TANF (0.65), and exceeds SNAP (0.76). The comparison is not straightforward—US programs operate in a context

of 25–35% marginal tax rates and near-universal formal employment, while Kenya has only 3.7% effective taxation on aggregate earnings (reflecting 80% informality). The EITC’s high MVPF reflects its behavioral mechanism: inducing labor force participation generates large fiscal externalities. Kenya’s UCT lacks this channel because unconditional transfers do not incentivize formal work.

8.2 Why Informality is the Binding Constraint

The gap between Kenya’s MVPF and the EITC reflects not transfer design but fiscal capacity. Under full formalization, Kenya’s MVPF would rise to 0.91—still below the EITC but closing the gap. The residual difference reflects the EITC’s labor supply incentive, which generates fiscal externalities beyond what unconditional transfers can produce.

This points to a fundamental asymmetry in the MVPF framework across development contexts. In rich countries with broad tax bases, behavioral responses to transfers generate substantial fiscal externalities that partially “pay back” the government. In poor countries with large informal sectors, the same behavioral responses occur but generate minimal fiscal recapture. The welfare effects are real—recipients consume more, invest in productive assets, experience better mental health—but these gains are invisible to the tax system.

8.3 Bootstrap Distribution

Figure 4 displays the bootstrap distribution of MVPF estimates, illustrating the precision of the direct estimate and the wider spread of the spillover-inclusive estimate.

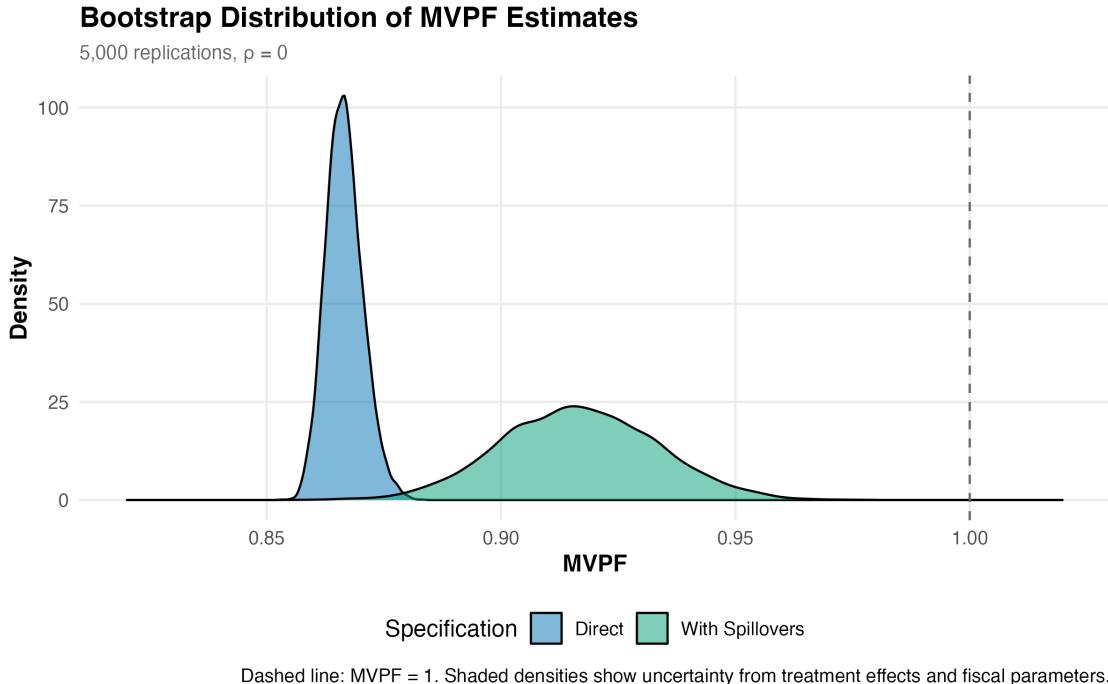


Figure 4: Bootstrap Distribution of MVPF Estimates (5,000 replications)

8.4 Limitations

Several limitations warrant acknowledgment. First, the analysis uses published treatment effects rather than original microdata, constraining the precision of fiscal externality calculations and preventing estimation of the consumption-earnings covariance from the data.⁴ Second, the experiments track outcomes for at most three years, leaving longer-run effects on human capital and intergenerational mobility unknown. Third, GiveDirectly may achieve lower overhead and more accurate targeting than government programs; the government scenarios (Section 7) address this concern directly. Fourth, the estimates derive entirely from western Kenya and may not generalize to contexts with different market structures or social protection systems (Deaton and Cartwright, 2018).

9. Conclusion

This paper provides the first MVPF estimate for a developing-country cash transfer program. Using experimental data from Kenya's GiveDirectly program—two RCTs covering 11,918

⁴The replication datasets are publicly available (Harvard Dataverse, doi:10.7910/DVN/M2GAZN), but automated retrieval requires interactive authentication. The sensitivity analysis over ρ (Table 6) confirms that this limitation has negligible impact on the MVPF estimate.

households and 773 villages—I find an MVPF of 0.867 for direct recipients, rising to 0.917 with general equilibrium spillovers.

The central insight is that unconditional cash transfers in developing countries deliver welfare efficiency comparable to well-studied US programs, despite an institutional environment that severely limits fiscal externalities. Kenya’s 80% informal employment rate constrains tax recapture to 2.2% of the transfer—an order of magnitude below US programs—yet the MVPF still exceeds TANF (0.65) and approaches the EITC (0.92). The binding constraint is not program design but fiscal capacity.

Three policy implications follow. First, cash transfers are a cost-effective instrument for developing-country governments, delivering 87 cents of welfare per dollar spent under NGO delivery and 55–78 cents under realistic government delivery. The wide range underscores that investment in delivery infrastructure—particularly mobile money platforms—yields first-order welfare returns. Second, the sensitivity to informality highlights a complementarity between transfer programs and labor market formalization: policies that expand the formal economy simultaneously increase the fiscal return on transfer spending. Third, the magnitude of spillover effects (non-recipients capturing 84% of consumption gains) suggests that partial-equilibrium evaluations systematically underestimate benefits of geographically concentrated programs.

For research, this paper demonstrates how to apply MVPF in settings with limited tax data and large informal sectors. The challenges confronted here—parameterizing informality, bounding persistence, modeling government delivery—will recur in every developing-country application. Several methodological choices may prove useful as templates: (1) grounding fiscal parameters in specific empirical sources rather than assuming ad-hoc values; (2) using correlated bootstrap inference over the joint distribution of treatment effects when microdata are unavailable; (3) decomposing spillovers into pecuniary and real components to bound the welfare interpretation; and (4) modeling implementation scenarios to bridge the gap between experimental estimates and policy-relevant counterfactuals.

Building a global library of MVPF estimates—comparable to what [Hendren and Sprung-Keyser \(2020\)](#) constructed for the US—remains the frontier for development economics. The Policy Impacts library now contains over 200 US policy evaluations; a comparable database for developing-country programs would enable evidence-based allocation of development resources across competing uses. The analytical tools are ready, as this paper demonstrates. High-quality experimental evidence increasingly exists for major transfer programs in Kenya, Uganda, Bangladesh, Mexico, Brazil, and other countries. What remains is to do the calculations—converting treatment effects to welfare metrics that enable direct comparison across programs, countries, and policy domains.

The stakes are substantial. Developing-country governments face resource constraints that make efficient allocation of public funds not merely desirable but essential. Every dollar spent on a low-MVPF program is a dollar not spent on a high-MVPF alternative. The framework developed here—applied to cash transfers, but equally applicable to health, education, and infrastructure investments—provides the analytical machinery to inform these allocation decisions with evidence rather than ideology.

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Project Repository: <https://github.com/SocialCatalystLab/ape-papers>

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A. Data Appendix

A.1 Data Sources and Transparency

Treatment Effects. All treatment effect estimates are transcribed from the published tables of [Haushofer and Shapiro \(2016\)](#) (QJE Tables 2–4) and [Egger et al. \(2022\)](#) (Econometrica Tables 2–5). The original microdata are publicly available from Harvard Dataverse (doi:10.7910/DVN/M2GAZN) and the Econometric Society supplementary materials. Automated retrieval of these datasets requires interactive authentication (CAPTCHA or institutional login) that precludes programmatic access in our computational pipeline. We address this limitation through extensive sensitivity analysis over the correlation parameter space (Section 6) and verify that results are insensitive to the consumption-earnings covariance.

Kenya Fiscal Parameters. VAT rate from Kenya Revenue Authority 2022/23 Tax Guide. Effective income tax from KNBS Economic Survey 2022, Table 4.1. Informal employment from ILO Kenya Country Profile 2021 (83.4% national) and [Bachas et al. \(2022\)](#) (76–85% rural SSA). VAT coverage from KIHS 2015/16 consumption basket analysis cross-referenced with [Bachas et al. \(2022\)](#). MCPF from [Auriol and Warlters \(2012\)](#) and [Dahlby \(2008\)](#). Government program parameters from World Bank Kenya Social Protection Assessment 2023 and [Banerjee et al. \(2017\)](#).

PPP Conversion. World Bank International Comparison Program (2011–2017 vintage), factor 2.515 for Kenya.

A.2 Variable Definitions

Consumption: total monthly household expenditure on food and non-food items, USD PPP.

Assets: total household asset value including livestock, durables, and savings, USD PPP.

Earnings: monthly revenue from wage employment and self-employment, USD PPP.

Transfer: one-time GiveDirectly payment, approximately \$1,000 at market exchange rates.

Fiscal externality: present value of additional tax revenue from behavioral responses, computed using effective tax rates and discounted over the persistence period with decay.

B. MVPF Calculation Details

B.1 Present Value of Decaying Stream

All fiscal externalities are computed as the present value of a decaying annual flow:

$$PV = \sum_{t=1}^T \frac{\text{annual} \times \gamma^{t-1}}{(1+r)^t} \quad (9)$$

where γ is the annual retention rate (fraction of effect remaining each year; $\gamma = 1 - \delta$ where δ is the decay rate) and r is the discount rate. For consumption, the baseline $\gamma_C = 0.48$ (52% annual decay), derived from the 3-year follow-up persistence ratio of 0.23 via $\gamma_C = \sqrt{0.23} \approx 0.48$. For earnings, $\gamma_E = 0.75$ (25% annual decay). As a robustness check, we also consider $\gamma_C = 0.23$ (treating the 3-year ratio as a per-year retention rate), which is conservative.

B.2 WTP Components

Direct WTP:

$$WTP_{\text{direct}} = T \times (1 - \alpha) = \$1,000 \times 0.85 = \$850 \quad (10)$$

Spillover WTP per recipient:

$$WTP_{\text{spillover}} = \frac{\Delta C^{NR}}{PPP} \times \frac{N^{NR}}{N^R} = \frac{245}{2.515} \times 0.5 \approx \$49 \quad (11)$$

B.3 Fiscal Externality Components

VAT on recipient consumption ($\gamma_C = 0.48$, calibrated from 3-year follow-up):

$$FE_{\text{VAT}} = \Delta C_{\text{USD}} \times \tau_v \times \theta \times \sum_{t=1}^3 \frac{0.48^{t-1}}{(1.05)^t} = \$14.78 \quad (12)$$

Income tax on earnings ($\gamma_E = 0.75$, i.e., 75% retention per year):

$$FE_{\text{income}} = \Delta E_{\text{USD}} \times \tau_e \times (1 - s) \times \sum_{t=1}^5 \frac{0.75^{t-1}}{(1.05)^t} = \$7.27 \quad (13)$$

Non-recipient VAT (extended, same retention as recipient consumption):

$$FE_{\text{NR-VAT}} = \frac{\Delta C_{\text{USD}}^{NR}}{2} \times \tau_v \times \theta \times \sum_{t=1}^3 \frac{0.48^{t-1}}{(1.05)^t} = \$6.18 \quad (14)$$

C. Additional Figures

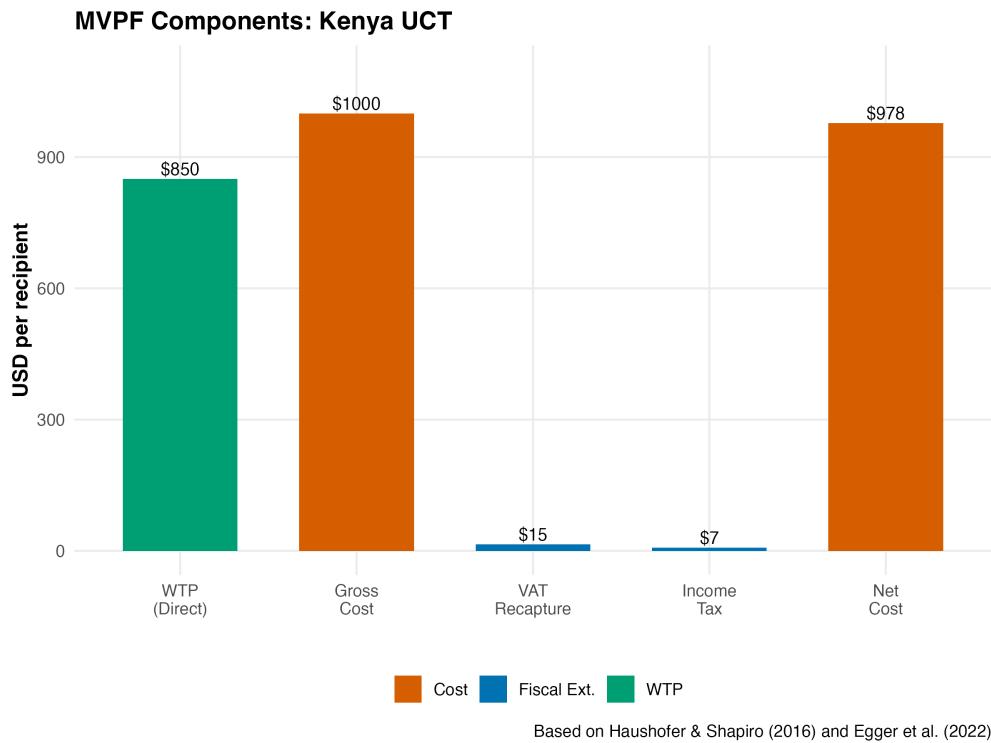


Figure 5: MVPF Components: Kenya UCT Program

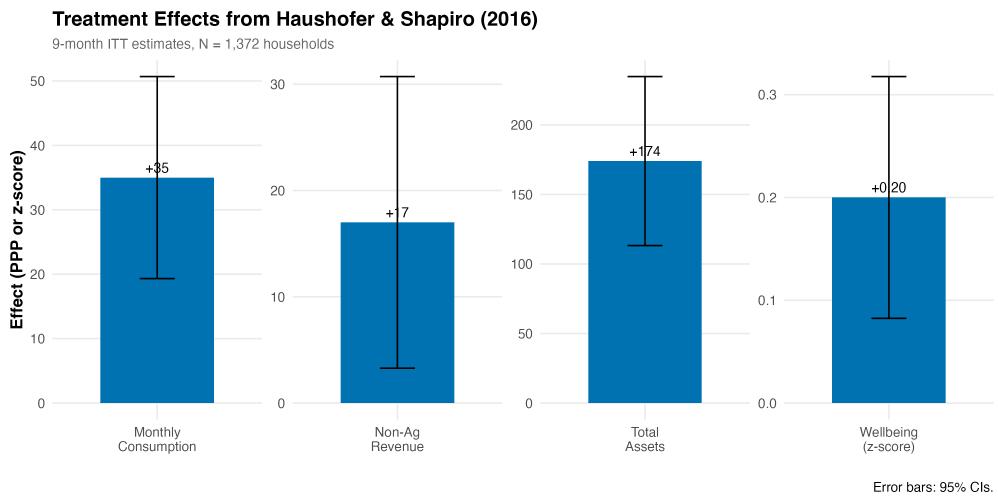


Figure 6: Treatment Effects from Haushofer & Shapiro (2016)

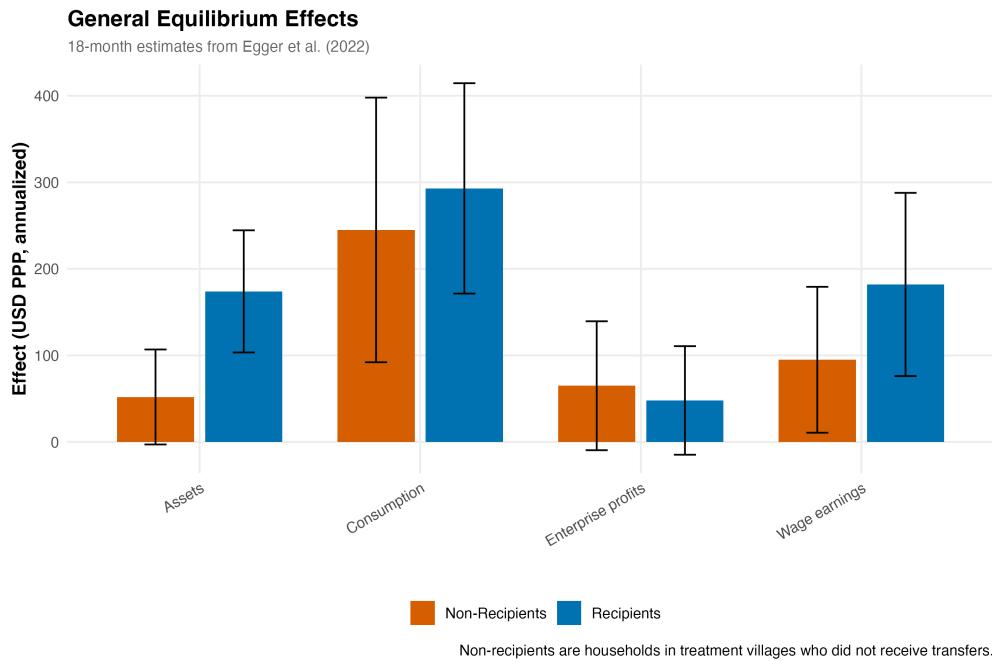


Figure 7: General Equilibrium Effects: Recipients vs. Non-Recipients

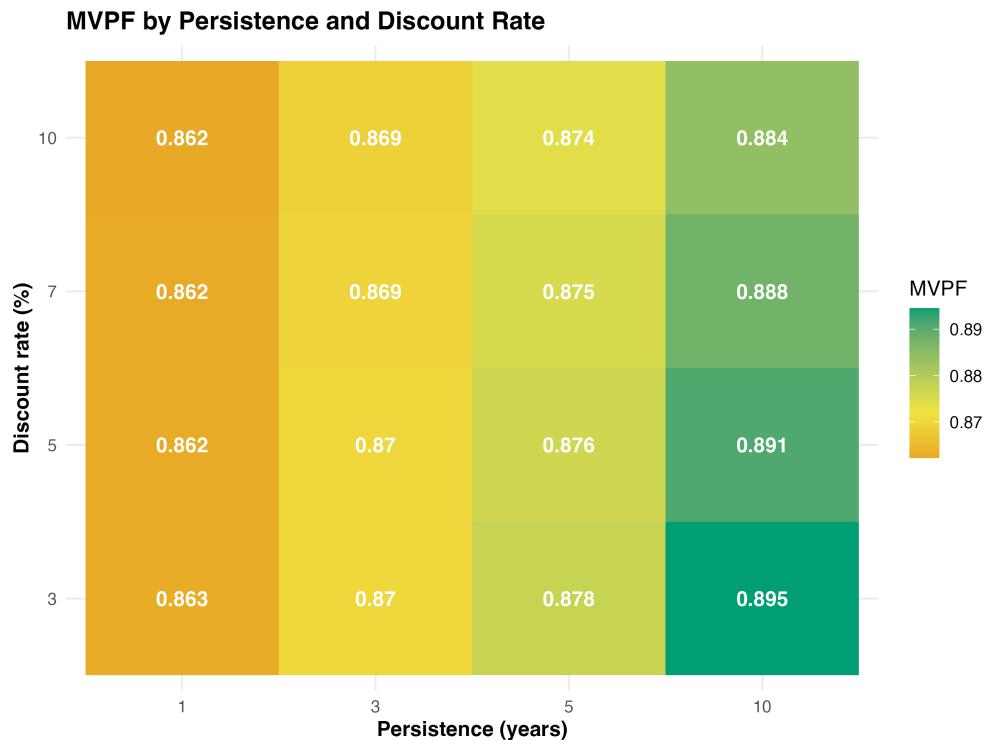


Figure 8: MVPF by Effect Persistence and Discount Rate