

Designing the Financial Tools to Promote Universal Access to AIDS Care

Patrick Leoni, University of Zurich
Stéphane Luchini, GREQAM-CNRS-IDEP

Health problem (UNAIDS 03)

- 42 million people worldwide are estimated to be HIV-infected
- 95% of those live in developing countries
- Five to six million of those living with HIV/Aids are in need of antiretroviral drugs

Subsidies for access to treatment have significantly increased

- US\$ 8.3 billion in 2005 (US\$ 8.9 billion and US\$ 10 billion in 2006 and 2007 expected)



Acrobat Document

- Domestic spending: US\$ 2.6 billion in 2005 (US\$ 2.8 billion and US\$ 3 billion in 2006 and 2007) in the 135 low and middle income countries.

But ... Investments still do not match the magnitude of the problem

„[...] Some countries are in a position to contribute more government resources to [fight] Aids“ (UNAIDS 2005, p.11)

Example: estimated number of people receiving ARV therapy currently ranges between 630 000 and 780 000 (12% coverage rate) (WHO 2004, December)

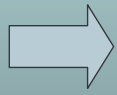
Main explanation advanced so far (Harling et al 2005):

1. Costs are prohibitive
2. Major crowding out of public resources

Another potential explanation ?

Two (non-mutually exclusive) possibilities

- "3 by 5" initiative (UN) and G8 will provide subsidies to promote universal access to treatment (\$30b)



Subsidies for « current technology » investments (ARV treatment)

- Foster R & D in HIV vaccine (for instance Push strategy, Kremer and Glennester 2004)



Support and incentives for innovative health technologies

A contradiction:

- These two possibilities is that they carry a contradiction:

The more the likelihood of future innovation (here HIV/Aids vaccine) is increased, the less governments and other public and private agents will have an incentive to invest in immediate treatment with ARV-drugs

- Intuition: Innovative treatment technology (HIV vaccine) will trigger severe losses in terms of sunk costs and upgrading costs



Reluctance to invest is thus a rational economic consequence with a direct impact on the death toll and the evolution of the epidemics (Dixit and Pindyck, 1994).

Our objective

To design a set financial tools generating full insurance coverage against such losses for developing countries, while achieving risk-sharing with bodies in charge of developing the vaccine.

- We show analytically that those tools increase the number of treated patients and social welfare in developing countries.
- Also, those tools foster investments in vaccine R&D

Economic impacts of the vaccine

- Sunk cost in ARV investments will be lost:
 1. Program level costs (at administrative levels outside the point of delivery): Management of AIDs programs, monitoring and evaluation, staff training, etc.: US\$ 1.2 billion in 2006, US\$ 1.1 billion in 2007 and US\$ 1.3 billion in 2007 for all low and middle income countries.
 2. Drugs production: drugs plants can partially be redirected to production of other drugs
 3. Other sunk costs: short-run inefficiencies such as HIV-dedicated hospitals and services re-oriented to other activites (depend on manageurial supervision)
- International bodies (WHO, GAFTAM) will promote vaccine treatments (far more effective both economically and medically), leading to significant drops in international subsidies

How to tackle this problem?

A standard insurance contract, allowing to hedge against possible vaccine appearance, is ineffective in practice

1. Too much money at stake
2. Impossibility to fully share the risk
3. Regulatory issues

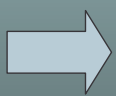
Designing the tools

Idea: to “securitize” a broad insurance contract, while achieving full risk-sharing.

Derivatives with payment contingent on the appearance (or not) of a successful vaccine, to be issued both by insurance companies and international agencies.

Arrow security

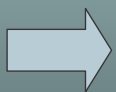
Consider an asset available at the time decisions to produce ARV are made, with a fixed maturity date and small payoff contingent on a successful vaccine being released before maturity date (*Arrow security*).



Demanded by developing countries and pharmaceutical companies producing drugs

Negatively correlated asset

To allow for full risk transfer, consider a financial asset identical to an Arrow security, with the difference that the same payment is made if a vaccine does not appear before the maturity date.



Demanded by the bodies responsible for developing the vaccine (even private, Kremer and Schnyder 04)

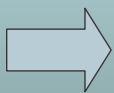
Practical implementation [1]

- Risk estimation: estimation of the probability of appearance of a successful vaccine

Mandatory progress reports during the testing trial (see Klausner et al. 04) allows to compute the conditional success probability of the vaccine.

Practical implementation [2]

1. Vaccine companies may start the testing trial with a product where small R&D has been made.



Requirement for Payment: approval by the testing agency to start the trial for at least one vaccine candidate, based on enough scientific evidence that the candidate can be successful

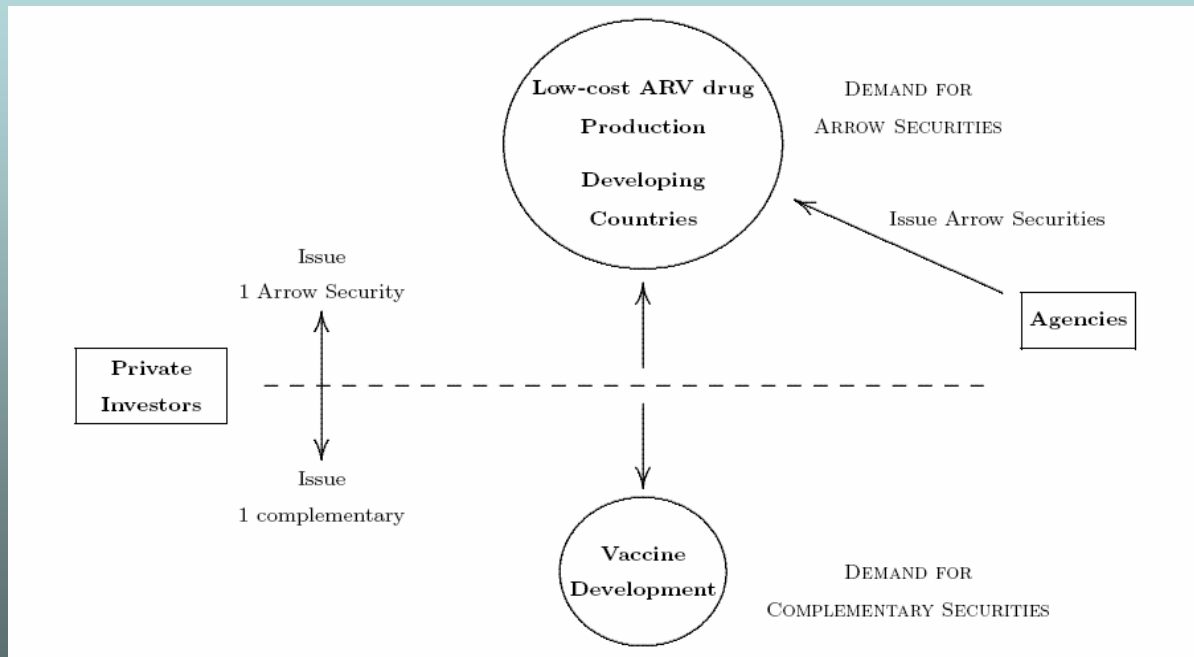
Acrobat Document

2. A company may not pay for further testing and thus generate profits by exercising the complementary security



Requirement for Payment: approval from the testing agency to stop all trials before their ends, instead of unilateral withdrawals from vaccine agencies

Achieving full risk-sharing



Conclusion

- We show that public investments in innovative treatments for current diseases is an economic disincentive to existing treatment production in developing countries.
- Not only the case for AIDS, as considered here, but also for major epidemics such as tuberculosis, malaria, sleeping sickness, Chagas disease and Dengue fever...
- The availability of financial securities allowing developing governments to hedge against future innovations is shown here to foster existing treatment production, social welfare as well as innovative treatment technologies.
- We argue that programs to finance similar health issues should be accompanied by the creation of financial tools such as the Arrow security and its complementary