

Documentation of Group Modeling Design and Research

Executive Summary of Technical Report

APPENDIX B Causal loop links documentation of the influence diagram (ID)

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From Variable	Links	To Variable
Accessibility of Knowledge	From	- Recognition of customary laws of indigenous people
		+ Scientific and technical knowledge
	To	+ Know-How Value
Adoption of technology	From	- Price of technology
		+ Sales
	To	+ Innovation
		+ Gov spending on R&D
Aggregated regulation	From	+ Public opinion attitude
		+ Legal sovereignty
		+ Number of public fora
		- Industry registered lobbyists
		+ Plant varieties eligible for sui generic protection
		+ Quality of risk analysis
	To	+ Exclusionary value
Average patent value	From	- Patent maintenance fees
		- Number of claims permitted / applications
		- Number of issued patents
		+ Sales
		+ Injunction Availability
		+ Post-Grant opposition
		+ Average protection for pharma
		+ Patent term
		- International exhaustion doctrine
		- Government use
		+ Pre-Grant opposition
		- Infringement Parameter
		+ Expected profit
	- Description	
	To	+ Price of technology
+ Value of IP		
Average protection for pharma	From	+ Industry registered lobbyists
		+ Number of public fora
	To	+ Average patent value
Basic and applied research\$	From	+ Gov. spending on R&D
		+ Formal diffusion of knowledge
		+ Scientific infrastructure
		+ Stability of political infrastructure
		+ Revenues
	To	//+ Gov spending on R&D
		+ Formal diffusion of knowledge
		//+ Scientific and technical knowledge
Benefit sharing flows	From	+ Genetic resources protection
		+ Respect for human rights
		+ Recognition of customary laws of indigenous people
		+ Revenues
	To	- Experimental development \$
		+ Scientific infrastructure
		+ Genetic resources conservation
		+ Late \$
Bilateral IP agreements	To	- Expected profit
		- Legal sovereignty
		+ Patent eligible invention

		-	International exhaustion doctrine
		+	Plant varieties eligible for sui generic protection
		+	Economic integration
Business capabilities	From	//-	Concentration of competition
		+	Technology transfer organizations
		+	Consortia
	To	//+	Education, training, degree
		+	Public exclusive licenses
		+	Public non-exclusive licenses
+		Innovation magnitude	
		+	Production capability
Competition regulation	To	-	Concentration of competition
		-	Public exclusive licenses
		+	Exclusionary value
Compulsory Licensing	To	+	Infringement Parameter
Concentration of competition	From	-	Competition regulation
		-	Revenues
		-	Production capability
	To	//-	Business capabilities
		+	Public exclusive licenses
		+	Public non-exclusive licenses
Consortia	From	+	University-industry links
		+	Number of spin-offs
	To	+	Formal diffusion of knowledge
		+	Scientific infrastructure
		+	Business capabilities
Copyright value	From	+	Expected profit
		+	Moral rights
		+	Remedy (Copyright)
		-	Exemption exists
		+	Injunction Availability
	-	Risk of infringement (Copyright)	
	To	+	Value of IP
Cost of patent application	From	+	PCT
	To	-	Number of patent applications filed
		-	Patent Grant rate
		+	Trade secret value
Cost of registration (Trademark)	To	-	TradeMark/TradeName value
Court procedure	From	-	Post-Grant opposition
		-	Pre-Grant opposition
	To	+	Invalidity Parameter
		-	Infringement Parameter
Democratization	From	+	Stability of political infrastructure
	To	+	Level of economic development
		+	Respect for human rights
		+	Stability of political infrastructure
		+	Number of public fora
		+	Media activity
Description	From	+	Patent eligible invention
	To	-	Patent Grant rate
		-	Average patent value
		-	Invalidity Parameter
Economic integration	From	+	Level of economic development
		+	Multilateral IP agreements
		+	Bilateral IP agreements
		+	Regional IP agreements

	To	-	Non tariff barrier to trade	
		-	Legal sovereignty	
		-	State bargaining power	
Education, training, degree	From	+	Scientific and technical knowledge	
	To	//+	Scientific infrastructure	
		+	Innovation magnitude	
		+	Quality of risk analysis	
		//+	Business capabilities	
Exclusionary value	From	+	Competition regulation	
		-	Imitation	
		+	Aggregated regulation	
		+	Pharma/health regulation	
		+	Tax regulation and policies	
		+	Technology transfer organizations	
			+	Value of IP
	To	+	Number of public fora	
		+	Late \$	
		+	Innovation magnitude	
		+	Imitation	
		+	Experimental development \$	
		//+	Media activity	
		+	Public exclusive licenses	
+		Public non-exclusive licenses		
		+	Expected profit	
Exemption Exists	To	-	Copyright value	
Expected profit	From	-	Benefit sharing flows	
		+	Exclusionary value	
		+	Value of IP	
		+	Sales	
	To	+	Trade Secret Value	
		+	Average patent value	
		+	Know-How Value	
		+	TradeMark/Trade Name Value	
		//+	Number of NGO	
		+	Copyright value	
Experimental development \$	From	+	Genetic resources protection	
		+	Exclusionary value	
		+	Gov. spending on R&D	
		+	PCT	
		+	Foreign investment (R&D)	
		+	Revenues	
		-	Imitation	
		+	Scientific infrastructure	
	-	Benefit sharing flows		
	To	+	Stability of political infrastructure	
+		Technology transfer organizations		
//+		Gov spending on R&D		
+		Number of spin-offs		
Feasibility of scientific infrastructure	To	+	Scientific and technical knowledge	
		+	Innovation	
		+	Imitation	
Foreign direct investment	From	+	Stability of political infrastructure	
		+	Public opinion attitude	
	To	+	Late \$	
Foreign investment (R&D)	From	-	Non tariff barrier to trade	
		+	Public opinion attitude	

		+	Stability of political infrastructure
	To	+	Innovation
		+	Scientific infrastructure
		+	Experimental development \$
Formal diffusion of knowledge	From	+	Consortia
		+	Scientific infrastructure
		+	Basic and applied research\$
		+	Innovation
		+	Patent pool
	To	+	Scientific and technical knowledge
		+	Basic and applied research\$
		+	Innovation
		+	Media activity
		-	Value of IP
	//+	Scientific infrastructure	
Genericization	To	-	TradeMark/TradeName value
Genetic resources conservation	From	+	Genetic resources richness
		+	Benefit sharing flows
	To	+	Scientific infrastructure
Genetic resources protection	From	+	Expected profit
		-	Industry registered lobbyists
		+	Genetic resources richness
		+	Legal sovereignty
		+	Treaty generic plant resource
	+	Respect for human rights	
	To	+	Benefit sharing flows
		-	Novelty
+		Restrictions on research for protection of integrity of living things and biodeiversity	
Genetic resources richness	To	+	State bargaining power
		+	Genetic resources conservation
		+	Patent related obligation to reveal origins
		+	Genetic resources protection
		+	Innovation
Gov. spending on R&D	From	+	Adoption of technology
		//+	Basic and applied research\$
		//+	Experimental development \$
		-	Imitation
		+	Scientific infrastructure
		+	Stability of political infrastructure
	+	Wealth	
	To	+	Experimental development \$
//+		Patent pool	
+		Basic and applied research\$	
+		Scientific infrastructure	
Government emphasis on technology transfer	To	+	Technology transfer organizations
Government use	To	-	Average patent value
Imitation	From	+	Feasibility of scientific infrastructure
		+	Exclusionary value
		+	Innovation magnitude
		+	Innovation
		+	Scientific infrastructure
		-	Value of IP
	To	-	Exclusionary value
		+	Sales
		-	Innovation
		-	Late \$
-		Value of IP	

		+	Scientific infrastructure
		-	Gov. spending on R&D
		-	Experimental development \$
Implementation of indigenous rights	From	+	Recognition of indigenous people rights
		-	Industry registered lobbyists
		+	Number of NGO
	To	+	Recognition of customary laws of indigenous people
Industry registered lobbyists	From	+	Number of public fora
		-	Quality of risk analysis
		-	Genetic resources protection
		+	Patent eligible invention
		+	Average protection for pharma
		-	Recognition of customary laws of indigenous people
		-	Implementation of indigenous rights
		+	State bargaining power
		-	Aggregated regulation
		-	Pharma/health regulation
Infringement Parameter	From	-	Injunction Availability
		-	Invalidity Parameter
		+	Compulsory Licensing
		-	Court procedure
	To	-	Average patent value
Injunction Availability	To	+	Copyright value
		+	Average patent value
		-	Infringement Parameter
		+	Trade Secret value
		+	TradeMark/TradeName value
Innovation	From	//+	Basic and applied research\$
		+	Feasibility of scientific infrastructure
		+	Experimental development \$
		+	Tax regulation and policies
		+	Genetic resources richness
		+	Formal diffusion of knowledge
		+	University-industry links
		+	Adoption of technology
		-	Imitation
		+	Inventions
		+	Foreign investment (R&D)
		+	Late \$
		+	Public exclusive licenses
		+	Public non-exclusive licenses
		-	Public exclusive license parameter
		//+	Patent pool
		+	Scientific and technical knowledge
		//+	Scientific infrastructure
		To	+
	+		Number of spin-offs
	+		Scientific infrastructure
	+		Sales
	+		Quality of risk analysis
	+		Public exclusive licenses
	+		Public non-exclusive licenses
	+	Formal diffusion of knowledge	
+	Technology transfer organizations		
-	Value of IP		
Innovation magnitude	From	-	Risk of Dissemination
		+	Exclusionary value

		+	Education, training, degree
		+	Business capabilities
		+	Wealth
	To	+	Sales
		+	Scientific infrastructure
		+	Scientific and technical knowledge
		+	Imitation
International exhaustion doctrine	From	-	Bilateral IP agreements
		-	Regional IP agreements
	To	-	Average patent value
		-	Price of technology
International human rights	To	+	Respect for human rights
		+	Recognition of indigenous people rights
		-	Legal sovereignty
Invalidity Parameter	From	-	Novelty
		-	Non-Obviousness
		-	Patent related obligation to reveal origins
		-	Description
		-	Utility
		-	Post-Grant opposition
		+	Court procedure
	To	-	Patent Grant rate
	-	Infringement Parameter	
Inventions	From	+	Scientific infrastructure
	To	+	Innovation
Know-How Value	From	+	Accessibility of Knowledge
		-	Risk of Dissemination
		+	Expected profit
	To	+	Value of IP
Late \$	From	+	Exclusionary value
		-	Imitation
		+	Foreign direct investment
		+	Stability of political infrastructure
		+	Revenues
		+	Benefit sharing flows
		+	Scientific infrastructure
	+	Technology transfer organizations	
To	+	Innovation	
Legal sovereignty	From	-	Economic integration
		-	International human rights
		-	Multilateral IP agreements
		-	Bilateral IP agreements
		-	Regional IP agreements
	To	+	State bargaining power
		+	Aggregated regulation
		+	Non tariff barrier to trade
+		Pharma/health regulation	
	+	Genetic resources protection	
Level of economic development	From	+	Democratization
		+	Wealth
	To	+	State bargaining power
		+	Economic integration
Media activity	From	+	Democratization
		+	Number of NGO
		//+	Exclusionary value
		+	Number of public fora
		+	Formal diffusion of knowledge
	+	Revenues	
To	+	State bargaining power	

		+	Public opinion attitude
Moral rights	To	+	Copyright value
Multilateral IP agreements	To	+	Economic integration
		-	Legal sovereignty
Non tariff barrier to trade	From	+	Legal sovereignty
	To	-	Economic integration
Non-Obviousness	From	+	Scientific and technical knowledge
	To	-	Invalidity Parameter
Novelty	From	-	Patent Grant rate
		-	TK as prior art
		-	Genetic resources protection
	To	-	Patent Grant rate
		-	Invalidity Parameter
Number of claims permitted / applications	To	-	Patent Grant rate
		-	Average patent value
		-	Number of patent applications filed
Number of issued patents	From	+	Patent Grant rate
		+	Number of patent applications filed
	To	//+	Patent pool
		-	Average patent value
Number of NGO	From	//+	Expected profit
		+	Number of public fora
		+	Public opinion attitude
	To	+	Number of public fora
		+	Media activity
		+	TK as prior art
		+	Patent related obligation to reveal origins
		+	Implementation of indigenous rights
		+	Recognition of indigenous people rights
		+	State bargaining power
		+	Public opinion attitude
+	Quality of risk analysis		
Number of patent agents per capita	From	+	Scientific infrastructure
	To	+	Number of patent applications filed
Number of patent applications filed	From	+	Number of patent agents per capita
		-	Cost of patent application
		-	Number of claims permitted / applications
	To	+	Scientific infrastructure
		+	Patent eligible invention
Number of patent examiners per capita	From	+	Number of issued patents
	To	+	Scientific infrastructure
		-	Patent Grant rate
Number of public fora	From	+	Democratization
		+	Exclusionary value
		+	Number of NGO
		+	Public opinion attitude
	To	+	Industry registered lobbyists
		+	Pharma/health regulation
		//+	Patent pool
		+	Average protection for pharma
		+	Aggregated regulation
		+	Restrictions on research for protection of integrity of living things and biodiversity
		+	Media activity
		//+	Quality of risk analysis
+	Public opinion attitude		
+	Number of NGO		

Number of spin-offs	From	-	University/owned university IP policy
		+	Technology transfer organizations
		+	Experimental development \$
		+	Public exclusive licenses
		+	Public non-exclusive licenses
		+	Public exclusive license parameter
		+	Innovation
	To	+	Public exclusive licenses
		+	Public non-exclusive licenses
		+	Technology transfer organizations
		+	Wealth
		+	Scientific infrastructure
		+	Consortia
		+	University-industry links
Patent eligible invention	From	-	Restrictions on research for protection of integrity of living things and biodiversity
		+	Industry registered lobbyists
		+	Bilateral IP agreements
		-	Plant varieties eligible for sui generic protection
	To	+	Novelty
		+	Number of patent applications filed
		+	Description
		-	Plant varieties eligible for sui generic protection
Patent exam qualification	From	+	Scientific and technical knowledge
	To	-	Patent Grant rate
Patent Grant rate	From	-	Pre-Grant opposition
		-	Novelty
		-	Description
		-	Patent maintenance fees
		-	Patent related obligation to reveal origins
		-	Utility
		-	Patent exam qualification
		-	Number of claims permitted / applications
		-	Cost of patent application
		-	Number of patent examiners per capita
		-	Invalidity Parameter
		-	Non-Obviousness
	To	+	Number of issued patents
Patent maintenance fees	From	//-	PCT
	To	-	Patent Grant rate
		-	Average patent value
Patent pool	From	//+	Number of public fora
		//+	Number of issued patents
		//+	Gov spending on R&D
	To	+	Formal diffusion of knowledge
		//+	Innovation
Patent related obligation to reveal origins	From	+	TK richness
		+	Genetic resources richness
		+	Recognition of indigenous people rights
		+	Number of NGO
	To	-	Invalidity Parameter
-		Patent Grant rate	
Patent term	To	+	Average patent value
PCT	To	//-	Patent maintenance fees
		+	Experimental development \$
		+	Cost of patent application
Pharma/health regulation	From	+	Public opinion attitude
		-	Industry registered lobbyists
		+	Number of public fora

		+	Legal sovereignty
		+	Quality of risk analysis
	To	+	Exclusionary value
Plant varieties eligible for sui generic protection	From	+	Bilateral IP agreements
		-	Patent eligible invention
	To	+	Aggregated regulation
		+	Value of IP
Post-Grant opposition	To	-	Patent eligible invention
		-	Court procedure
		-	Invalidity Parameter
Pre-Grant opposition	To	+	Average patent value
		-	Court procedure
		-	Patent Grant rate
Price of technology	From	-	Sales
		-	International exhaustion doctrine
		+	Average patent value
	To	-	Production capability
Production capability	From	-	Adoption of technology
		-	Production costs
	To	+	Business capabilities
		-	Concentration of competition
Production costs	To	-	Price of technology
		-	Sales
		+	Production capability
Public exclusive license parameter	To	+	Public exclusive licenses
		-	Public non-exclusive licenses
		-	Innovation
		+	Number of spin-offs
Public exclusive licenses	From	+	Business capabilities
		-	Competition regulation
		+	Public exclusive license parameter
		+	Technology transfer organizations
		+	University-industry links
		+	Number of spin-offs
		+	Concentration of competition
		+	Exclusionary value
		+	Innovation
		+	Stability of political infrastructure
	+	University/owned university IP policy	
	To	+	Number of spin-offs
		+	Revenues
		+	Innovation
+		Sales	
Public non-exclusive licenses	From	+	Business capabilities
		+	Technology transfer organizations
		-	Public exclusive license parameter
		+	University-industry links
		+	Number of spin-offs
		+	Concentration of competition
		+	Exclusionary value
		+	Innovation
	To	+	Stability of political infrastructure
		+	University/owned university IP policy
		+	Number of spin-offs
		+	Revenues
		+	Innovation
		+	Sales

Public opinion attitude	From	+	Media activity
		+	Number of NGO
		+	Number of public fora
		+	Quality of risk analysis
	To	+	Number of NGO
		+	Foreign direct investment
		+	Foreign investment (R&D)
		+	Aggregated regulation
		+	State bargaining power
		+	Pharma/health regulation
		+	Number of public fora
		+	Sales
Quality of risk analysis	From	+	Number of NGO
		//+	Number of public fora
		+	Stability of political infrastructure
		+	Innovation
		+	Education, training, degree
		+	Scientific infrastructure
	To	-	Industry registered lobbyists
		+	Aggregated regulation
		+	Public opinion attitude
		+	Pharma/health regulation
		+	Exclusionary value
Recognition of customary laws of indigenous people	From	+	Implementation of indigenous rights
		-	Industry registered lobbyists
	To	-	Accessibility of Knowledge
		+	Benefit sharing flows
Recognition of indigenous people rights	From	+	Number of NGO
		+	Respect for human rights
		+	International human rights
	To	+	TK as prior art
		+	Patent related obligation to reveal origins
		+	Implementation of indigenous rights
Regional IP agreements	To	-	Legal sovereignty
		-	International exhaustion doctrine
		+	Economic integration
		+	State bargaining power
Remedy (Copyright)	To	+	Copyright value
Remedy (TradeMark)	To	+	TradeMark/Trade Name Value
Remedy (TradeSecret)	To	+	Trade Secret Value
Revenues	From	+	Sales
		-	Public exclusive licenses
		+	Public non-exclusive licenses
	To	+	Technology transfer organizations
		+	Basic and applied research \$
		+	Experimental development \$
		+	Late \$
		-	Concentration of competition
		+	Wealth
		+	Benefit sharing flows
+	Media activity		
Respect for human rights	From	+	Democratization
		+	International human rights
	To	+	Genetic resources protection
		+	Recognition of indigenous people rights
		+	Benefit sharing flows
		+	Restrictions on research for protection of integrity of living things and biodiversity

Restrictions on research for protection of integrity of living things and biodiversity	From	+	Number of public fora
		+	Genetic resources protection
		+	Respect for human rights
Risk of Dissemination	To	-	Patent eligible invention
		-	Know-How Value
Risk of Infringement (Copyright)	To	-	Innovation magnitude
Risk of Infringement (TradeMark)	To	-	Copyright value
Risk of Infringement (TradeMark)	To	-	TradeMark/Trade Name Value
Risk of Invalidity (Trademark)	To	-	TradeMark/Trade Name Value
Sales	From	+	Imitation
		+	Innovation
		+	Public exclusive licenses
		+	Public non-exclusive licenses
		+	Innovation magnitude
		+	Production capability
		+	Public opinion attitude
	To	+	Wealth distribution
		+	Average patent value
		+	Trade Secret Value
		-	Price of technology
To	+	Adoption of technology	
	+	Revenues	
	+	Expected profit	
Scientific and technical knowledge	From	//+	Basic and applied research\$
		+	Innovation magnitude
		+	Experimental development \$
		+	Formal diffusion of knowledge
	To	+	Accessibility of Knowledge
		+	Patent exam qualification
		+	Non-Obviousness
		+	Innovation
Scientific infrastructure	From	+	Education, training, degree
		+	Feasibility of scientific infrastructure
		+	Consortia
		+	Innovation
		+	Foreign investment (R&D)
		+	Genetic resources conservation
		+	Benefit sharing flows
		+	Number of spin-offs
		+	Innovation magnitude
		+	University-industry links
		//+	Education, training, degree
	//+	Formal diffusion of knowledge	
	+	Gov. spending on R&D	
	+	Imitation	
	To	+	Gov. spending on R&D
		//+	Innovation
		+	Formal diffusion of knowledge
		+	Inventions
		+	Number of patent examiners per capita
+		Number of patent agents per capita	
+		Number of patent applications filed	
+		Quality of risk analysis	
+	Basic and applied research\$		
+	Experimental development \$		
//+	Technology transfer organizations		

		+	Late \$
		+	Imitation
Spending on post-sec. education	To	-	Technology transfer organizations
Stability of political infrastructure	From	+	Democratization
		+	Wealth
	To	+	Public exclusive licenses
		+	Public non-exclusive licenses
		+	Gov. spending on R&D
		+	Quality of risk analysis
		+	Foreign direct investment
		+	Foreign investment (R&D)
		+	Late \$
		+	Basic and applied research\$
		+	Experimental development \$
		+	Democratization
State bargaining power	From	-	Economic integration
		+	Public opinion attitude
		+	Media activity
		+	Number of NGO
		+	Legal sovereignty
		+	Genetic resources richness
		+	Industry registered lobbyists
		+	TK richness
		+	Level of economic development
Tax regulation and policies	To	+	Innovation
		+	Exclusionary value
Technology transfer organizations	From	+	Innovation
		-	Spending on post-secondary education
		+	Number of spin-offs
		+	Government emphasis on technology transfer
		+	Revenues
	To	//+	Scientific infrastructure
		+	Exclusionary value
		+	Number of spin-offs
		+	Public non-exclusive licenses
		+	Public exclusive licenses
		+	Business capabilities
		+	Experimental development \$
+	Late \$		
TK as prior art	From	+	TK richness
		+	Number of NGO
	To	+	Recognition of indigenous people rights
TK richness	To	-	Novelty
		+	TK as prior art
		+	Patent related obligation to reveal origins
Trade Secret Value	From	+	State bargaining power
		+	Cost of patent application
		+	Sales
		+	Expected profit
		+	Injunction availability
	+	Remedy (TradeSecret)	
	To	+	Value of IP
TradeMark/Trade Name Value	From	+	Expected profit
		+	Injunction availability
		+	Remedy (TradeMark)
		-	Risk of infringement (TradeMark)
		-	Risk of Invalidity (Trademark)

		-	Genericization
		-	Cost of registration (Trademark)
	To	+	Value of IP
Treaty on generic plant resource	To	+	Genetic resources protection
University/owned university IP policy	To	+	Public exclusive licenses
		+	Public non-exclusive licenses
		-	Number of spin-offs
University-industry links	From	+	Number of spin-offs
	To	+	Consortia
		+	Scientific infrastructure
		+	Innovation
		+	Public exclusive licenses
		+	Public non-exclusive licenses
Utility	To	-	Invalidity Parameter
		-	Patent Grant rate
Value of IP	From	-	Formal diffusion of knowledge
		-	Imitation
		+	Plant varieties eligible for sui generic protection
		-	Innovation
		+	Copyright value
		+	Know-How Value
		+	Average patent value
		+	Trade Secret Value
	+	TradeMark/Trade Name Value	
	To	-	Imitation
		+	Expected profit
		+	Wealth
		+	Wealth distribution
+		Exclusionary value	
Wealth	From	+	Number of spin-offs
		+	Revenues
		+	Value of IP
	To	+	Level of economic development
		+	Innovation magnitude
		+	Stability of political infrastructure
		+	Gov. spending on R&D
Wealth distribution	From	+	Value of IP
	To	+	Sales