

How to Explain History Using SD Model

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Abstract: There would be three approaches for explain history using SD model. First one is, explain change of history with change of mechanism that driven history. For example, International trade network of Arabic merchant was taken over by armed Portuguese Navy and this change drives change of Swahili culture. This shown Ki Swahili language commonly adapted in East Africa includes so many words from Portuguese. Second approach is, explain with adaptation of model, similar like business model leads to success firm in these days. Some country could success because they adapt that model, while other country decline because fail to adapting that business model. This approach may think history as competition of countries like competition of firms in business world. Third approach is using agent model and represent elements of history with agents. Event of history would reappear with behavior and interactions between agents. In this paper, I shows how effective for explain history using SD model with first two approaches.

Key Words: History, Swahili Culture, Business Model

1. How to explain history using System Dynamics – Objective of this paper

History is normally explained as chain of event. Chain of event sound logical explanation of why such history is created, but this could unintended misleading. For example, Vasco da Gama, Portuguese sail from Portugal to India in 1498. Age of Discovery was started. Then Portuguese establishing trade network cover to Macau, China and become one of world hegemonies. This trade network connect with other world trade network established by Spanish covers to Manila, Philippines via South America and makes international trade network and bases of international trade currency (one dollar value silver). This system is very bases of modern international trade system. All events mentioned here are true. However, many students may easily misunderstand as Portuguese (or European) makes very basis of modern trade system from this chain of events. I may explain later this is completely misunderstanding and could avoid such misunderstanding using SD model. I added one more example of such misleading caused by history explained by event chain. Modern history of colonization (for example by British) is explained as Western Countries invade and colonize (for example, in Africa). In this event explanation, true reason of forwarding colonization is completely missing. Colonization is different type of economic war in Europe but appears in Africa or Asia. Using SD model for explain history could avoid such misleading caused by view of event chain.

Explain history using SD model could makes different view to history. This means people can imagine what if event (event was not happen or event happen differently), but rather understand mechanism of how history was changed. What if scenario and imagination could apply and people may enjoy many story of something different in history. For example, one of documentary video insists Jesus Christ was spend in India and had Buddhism training. Historical documents records Indian trader did business in Alexandria, Egypt in 1st century and could make encounter of Jesus Christ and Buddhist monk. Also similarity between early Christianity and Buddhism this documentary video insists would be acceptable. But this paper does not insist as SD can make such different story for imagination. Rather, this paper insists there is three approaches for explain history with SD model. First approach focus to find how history (system) evolving by incident (event). Ancient system evolves to medieval system and then shifting to modern system by influence including intervention of other social system, invaded by other countries for colonization, or through peaceful trade.

Second approach is understanding system with framework such as we understand business system with business model. Therefore, apply sort of success business model and find what is key success factors and why some country could success while other failed. This paper explains these two approaches applying in

case of history on Swahili Coast, East Africa during AD 1st century to World War I, covering almost 1,900 years.

Third approach is looks rather event chain among agents. Country or major group assumed as agent influencing to other with force, or peaceful negotiation, and changing relation, socio-economic system and emotion of people. But this paper does not mention about this third approach.

2. System view to history

Most people look history as event chain. Only few consider history as system. First person who looks history as system is Karl Marx. He thinks two layers socio-economic system as socio-political system (upper layer) stand top on economic system (lower system). He explains history changed when system of lower layer forces to changing upper layer system in his Historical Materialism (Marx, 1844). He explains shift of ancient system to medieval system and then further transfer to modern system with evolving of economic system. He then further insists economic system may shifts to communism in his famous book, "The Capital". However, that is not subject of this paper. I only have interest with his theory of changing lower layer system (economic system) forces to changing upper layer system (socio-political system), as first view of explaining change of history with concept of dynamic system. There are so many evidence supports to his theory. For example, early immigrant from England to James Town, colonial America during 17th century gradually had economic power. Even sponsor (British noble) try to governing with medieval system (sort of slave firmer system) still widely adapted in East Europe those days, however, immigrants gradually insists self-governance for protect their property from scarify by home country (and sponsor). Their wiliness establish freedom economic system and leading to independence. Freedom economic system established in Colonial America refuses to governance by British while immigrant to other places rather hopes to maintain their colonial system under permission by their home country. Many South American country never try to change their economic system that social elite controls everything, even their home country shift to freedom economic system after corruption of monarchic governance system and change to democratic system. During colonial system was maintained, their history could not change. At last, that forced to change by independent movement after World War I and II, however, still come country maintaining elite control economic system until quite recently.

Second and opposite idea of system view to history was insisted by Max Weber. He insists also changing of socio-political system (upper layer) forces to changing economic system (lower layer) (Weber, 1904). Also there are so many examples supporting to this theory. In 17th century of Holland under control of Spain moves to independent by difference of religion (Spain is Catholic country and Holland is Protestant country). Since their socio-political system stand on middle class merchant, they hope to guarantee free trade system. This situation leads establishing capitalism in Holland and England, and power of nations shifted from Spain and Italy to Holland and British. Their system (democratic system of Holland and weak monarchy system in England) makes possible to establishing capital system that spread worldwide.

More recently, Immanuel Wallerstein insists focusing factor to change social system and try to explain history with these changing. He mainly focus on how capitalism changing and create industrial countries (Wallerstein, 1974, 1980, 1984). Although this paper follows his view of history as system, however, not narrowing to capitalism.

As mentioned before, this paper try to show how to explain history in case of Swahili Coast with two approaches, 1) how factors influence to evolving history and 2) how some country could success for establishing colonial country while other could not much success during 16th to 19th century in East Africa.

3. Evolution Approach – how history of Swahili coast changing

This approach intends to show how event changes system of history in case of history in Swahili coast.

(1) Ancient to Medieval Era – BC to 7th Century

Still many people believe black history of Africa after fall of ancient Egyptian civilization. However, this is not true. Swahili coast covers East Africa including Kenya and Tanzania has long history of trade with Ancient Greece and Rome, according with "*The Periplus of the Erythraen Sea: Travel and Trade in the Indian Ocean by a Merchant of the First Century*" (Schoff. (ed),). This is ancient record

of Greek traveler sailing around many cities in coast of Indian Ocean, Red Sea and Mediterranean Sea during first century. In those ancient days in East Africa adapts tribe system controlled by chief. Tribe chief control his tribe and trade with merchant comes from Middle East and India, and Mediterranean for jewelry (from India), wine (from Mediterranean), gee (fine butter from India), with ivory, gold, copper ingot and slave. Slave is prisoner of war captured during war with hill side tribe. Ivory is sort of symbol item for decorate house of tribe chief. Tribe chief collect ivory and gold through peaceful trade with hill tribe, but sometimes deprive during war. Imported item and rare gorgeous item may enhance power of chief to his people and contributing more support to him from his people. He could have more chance to win war with enemy hill side tribe, if he got more support from his people. This concept of symbol of power may enhance more power adapted also in Ancient Maya Civilization model by Hosler (1977) and Coyle (1999). In merchant side, majority is Arabic and Indian merchant but sometimes merchant from other place including Greek and Egyptian joins. They are basically independent or family. This system and trade relation with Arabic and Indian merchant continues to 7th century.

Table 1: Time phase of Swahili culture history

Era	Duration	Event	Trade System	Governance
(1) Ancient	BC to AD 7th Century		Trade of family or group of merchants	chief system
(2) Medieval	7th to 16th Century	Building trade cities for international trade network by Arabic merchants	International trade network by Arabic merchants	chief system
(3) Modern-1	16th to 18th Century	Empire of Sea by Portuguese	Take over of international trade network by Portuguese and corruption after Portugal merged with Spain	trade point system in merchant side and chief system in African side
(4) Modern-2	18th to 19th century	Zanzibar Empire	International trade under Zanzibar Empire	feudal system
(3) Colonialism	19th to early 20th century	Colonized by West European countries	Colonized by British and Germany and international trade among home country and colonial countries	colonial system
(4) Contemporary	20th century -	Independent	International trade under capitalism	autonomous system

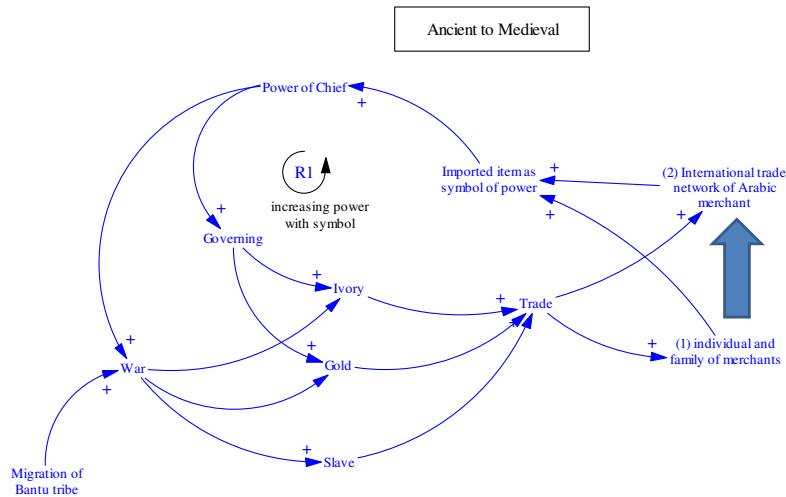


Fig. 1: Shifting ancient era to medieval era in Swahili coast (qualitative model)

Figure 1 shows evolution of ancient trade system to medieval trade system. System of trade in merchant side evolves from individual trade to trade syndicate. This shown shifting of (1) individual and family merchant to (2) international trade network by Arabic merchant. While African side increasing a bit supply of slaves but not change their structure. Quantitative model and simulation result shown in Figure 2 (but eliminate gold trade).

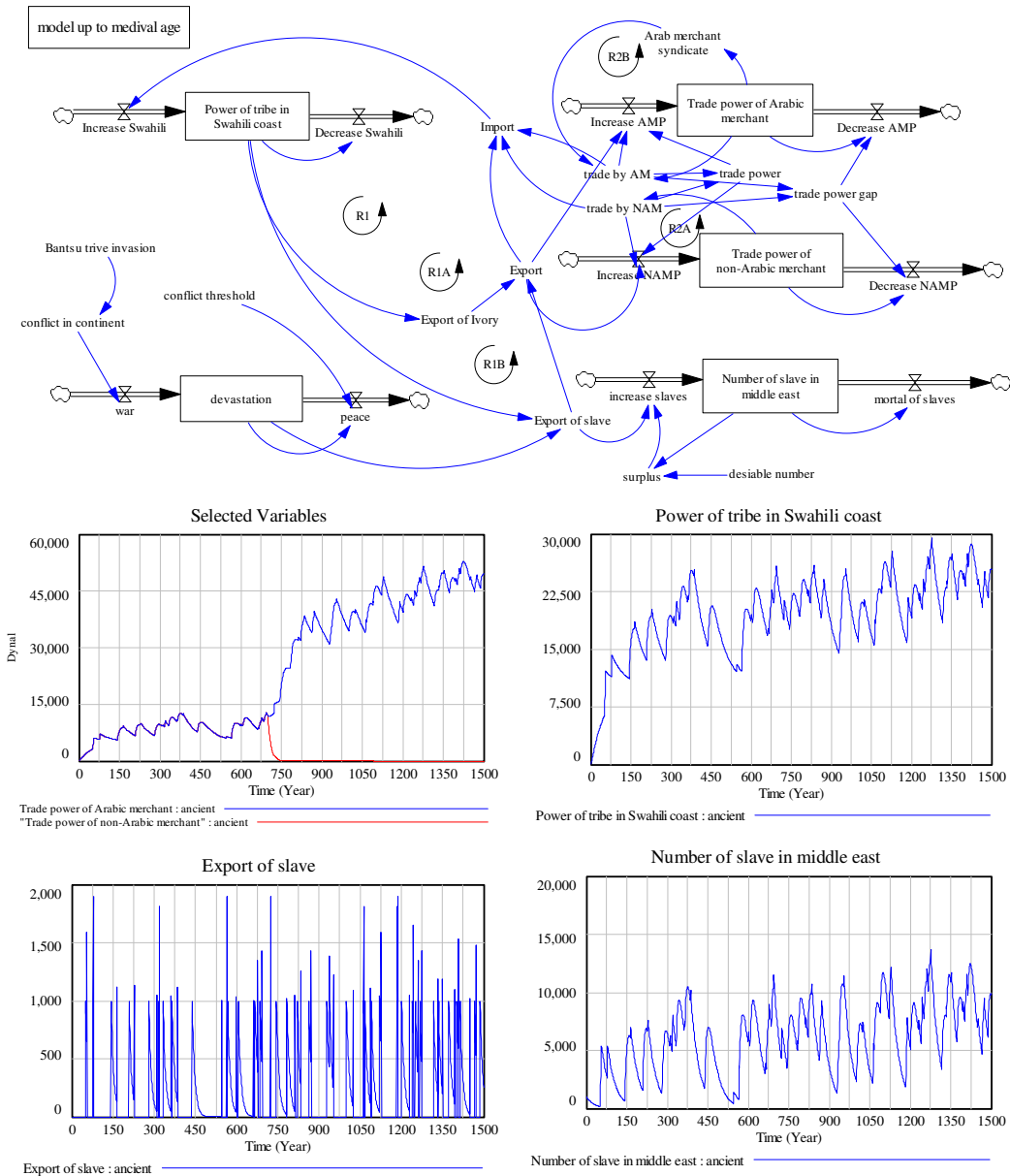


Fig. 2: Shifting ancient era to medieval era in Swahili coast (quantitative model and simulation from AD1 to AD1500)

Then in 7th century, Islamism is emerged and disseminating among Arabic merchant. They built international trade network link with South East Asia, China, India, Middle East, East Africa and Mediterranean Europe. Islamism makes easy relationship among same religion and their trade network spread so easily around the world they know. In Swahili coast, there are so many ruins of

trade city with rampart, including Kilwa, Maphia, Kaole, Tongoni, Tumbatsu, Chwini, Punjini, Ras Mkumbuu, Chambani in Tanzania and Mombasa in Kenya. Such trade cities believed people from Shiraz in Iran come to build during 9th to 14th century. Trade cities are mostly built on island near mainland or peninsula for defense purpose. Wall is made by coral stone for shortage of rock. City has several mosques and palace. Some ruins have only cemetery and mosques. Their grave decorated by beautiful ceramics imported from China. These shows Arabic merchant has international trade network (excluding Europe, New World and Oceania, but those are world they know in those days). They trade ivory, gold and slave with many gorgeous item imported from India and China. Power of Arabic merchant supported with international trade network may have more trade power and attractiveness to chief of Swahili coast.

In mainland of African in these days, Bantu tribe moving and causes many conflict with tribe already settled, and make situation for supply slave easily. War between tribes, winner capture prisoner and use them as slave. When in chance, tribe chief grads to exchange with imported goods. Slave shipping to mainly Middle East and use labor including sugar plantation in Iraq. But increasing African slave cause Zanj revolution and almost choke Abbasid Caliphate. Swahili language is common language many people speak in this region developed during this time mix with Bantu Language and Arabic.

(2) Medieval to Modern Era – Portuguese’s Emerging Empire of Sea and their sudden corruption

Sail of Vasco da Gama in 1498 to India influence and leading establishing Empire of Sea by Portuguese and destroy Arabic merchant syndicate by navy power *1). Arabic merchant basically want international trade with fair and peaceful competition, but Portuguese insists monopoly trade and destroy trade cities established by Arabic merchant and take over, and then recreate new trade network. This network link with Portuguese navy and naval controlled port cities control all trade from Portugal to Africa, Indian Ocean and South East Asia. Moreover, they even export arms that enhance power of tribe chief. Since Spanish could not have slave trade center in Africa even though they need lots of slave for their sugar plantation in Central and South America, Portuguese success to shipping many slave from West Africa to Spanish colonial countries and America. However, shipping of slave from East Africa is not much and mostly shipping to French colonial in East Africa, but some are shipping to Philippines for sugar plantation.

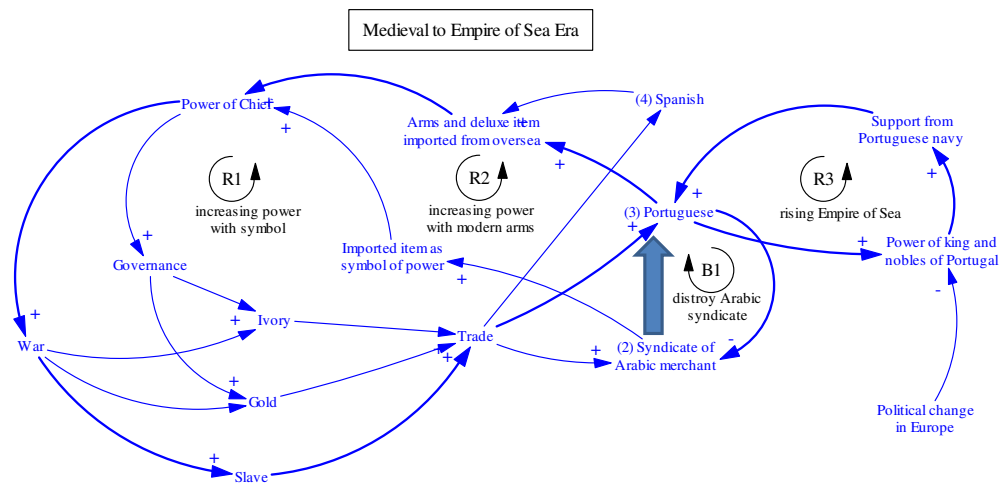


Fig. 3: Influence of rising Empire of Sea to Swahili coast (qualitative model)

However, Empire of Sea does not keep long and create vacuum of international trade in Swahili coast after Portuguese King Sebastian killed in battle with Muslim and his kingdom merged with Spain. Spain merge their international trade network from Spain to Philippines via Mexico with already established international trade network of Portuguese from Europe to South Asia and China via Africa and India.

From this era, real international trade network from Europe to New World, Asia, India and Africa is established. Mexican silver dollar now becomes sort of international currency that can tradeable any trade center on the international trade network from Spain, Mexico, Philippines, Macau and Goa. This Mexican dollar inherits to US dollar, Yen and Yuan as same silver amount coin equal value tradable. Mexico and Manila become key point of this international trade. However, Spanish navy rather focus to protect their Atlantic trade network shipping silver from Central and South America to Spain than trade network from South Asia to Europa via Africa. This is simply Spain fights with England, Holland and Osman Turk in Europe and they need so much silver from New World. Even Spain got so fluent wealth from America, still she bankrupted several times that leading decline of the empire and allows rising of Holland and England. Added more, trade center is not in Spain, but Amsterdam, Holland. And banking center is also not in Spain, but Northern Italy. Even Spain has strongest military power, but not supported by economy and therefore, their military power is so fragile.

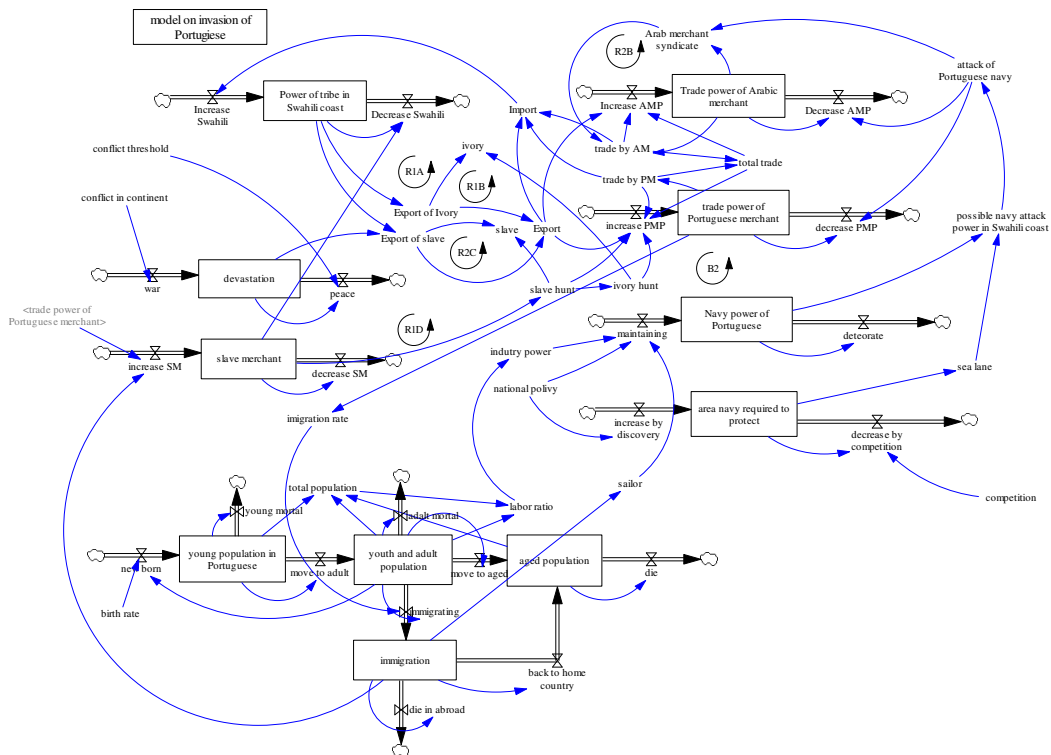


Fig. 4: Influence of rising Empire of Sea to Swahili coast (quantitative model)

Even drastic change of power structure in the international world, world in mainland Africa is basically same. However, Bantu race gradually settled and reducing conflict between other tribes. However, involvement of Portuguese increases scare of fight a bit. Basically, power structure in mainland is not change. People were governed by their chief, and tribe chief become Muslim and pronounced them as local Sultan.

After Zanzi revolution, Middle East tries to divesting origin of slaves for avoiding resistance. Even importing of slaves increase, however, number of slaves from East Africa is not increasing much. Figure 5 also consider this effect.

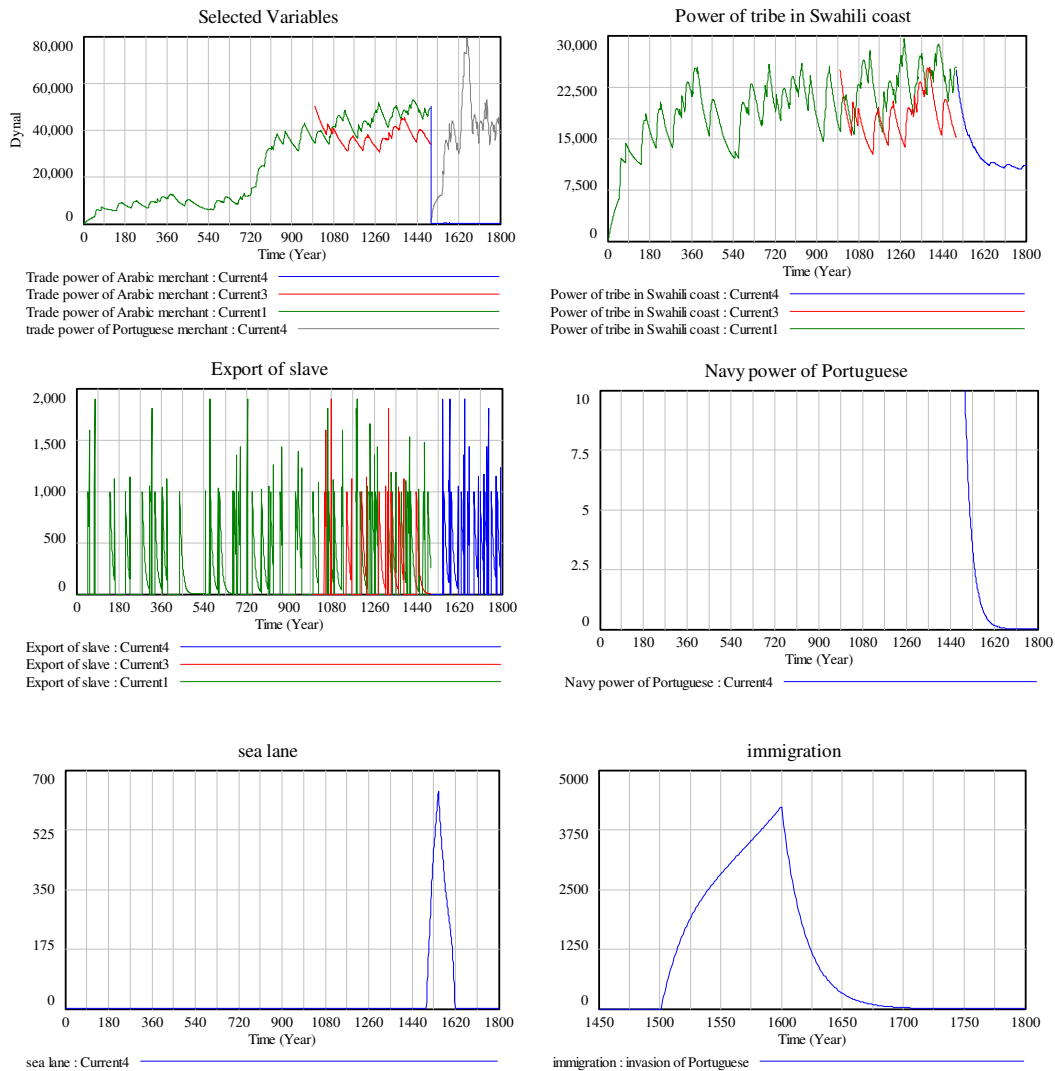


Fig. 5: Influence of rising Empire of Sea to Swahili coast (simulation) *2)

(3) Modern 1 to Modern 2 Era – Rises of Zanzibar Empire

After Portugal merged with Spain and create vacuum of sea power in Indian Ocean, Sultan of Oman built Zanzibar Empire based on Zanzibar, now in Tanzania. Monopolized spice trade by Portuguese and Dutch East Indian Trade Company make shortage of spice in Middle East and South European market. Price of spice increases rapidly. Sultan of Oman finds business opportunity and establishing spice firm in Zanzibar. He moves his capital city to Stone Town, Zanzibar. Oman also have navy and could control peace and order in Swahili Coast. For maintaining spice plantation firm, they need huge amount of slave labor. He invading to main land and control local Sultan under his control and establishing federal system empire. But mostly this invading is leaded by Arabic slave merchant and Sultan of Zanzibar is mostly supporting their activity and guarantee for permit governance of local Sultan in mainland as condition of they provide sufficient amount of ivory. When shortage of ivory and slave, Arabic merchant directly hunting ivory and slave. Ivory is carried by slave purchased in mainland market to Zanzibar. Slave sold to plantation owner and surplus is sold to slave trader who ship those slave to French Colonized East Africa and Middle East. They sold high quality ivory to Middle East, India and China for deluxe decorative furniture and sold low quality ivory to Europe for key board of music instrument booming in Europe in those days.

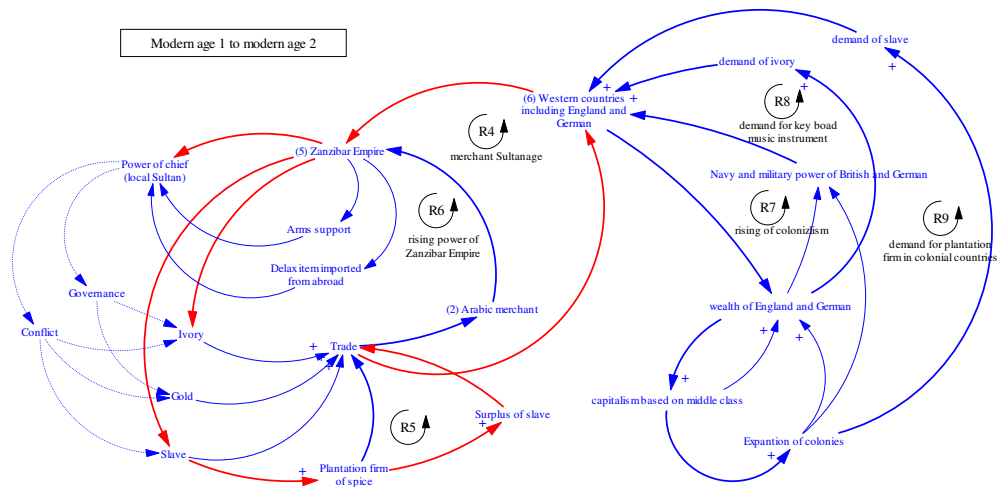


Fig. 6: Rising Zanzibar Empire (qualitative model)

Spain and Portugal do not have enough power for supporting and maintaining colonies in East Africa while England and Holland also could not have enough sea power for establishing and supporting colonies in this region. Holland was busy to maintaining Indonesia and England is also so busy to maintaining India. However, safety of trade route in East Africa is so important for both Holland and England, they rather approve control by Oman. Sultan of Oman also guarantees safety of sailing and trading in his country.

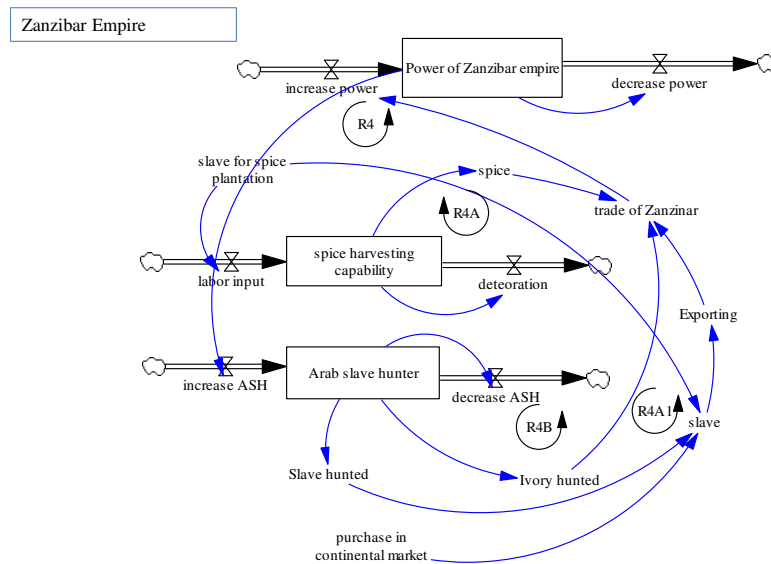


Fig. 7: Rising Zanzibar Empire (quantitative model)

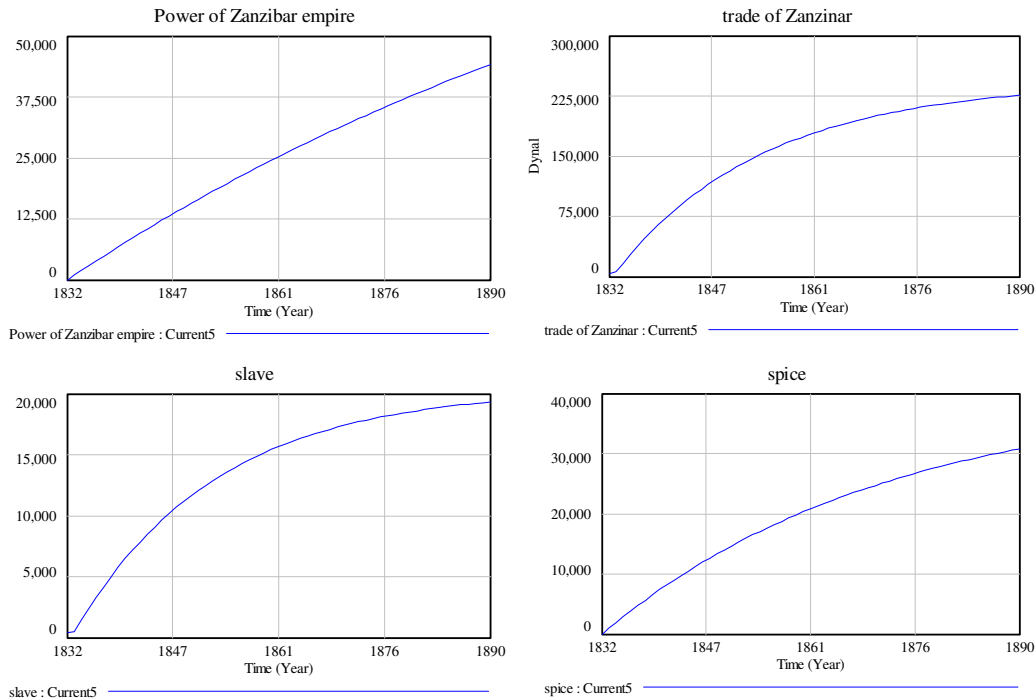


Fig. 8: Rising Zanzibar Empire (simulation result)

Figure 6 shows this power shift in African side and Zanzibar Empire rather directly hunt slave and ivory from indirect collection through local thief, as well as local tribe thief becomes local Sultan approved as sort of federal load. On merchant side, trader is change from Portuguese to England and Holland as well as Arabic merchants. Portuguese trade cities are re-occupied by Arabic and Zanzibar. Now, Zanzibar becomes biggest trade center in East Africa.

Figure 7 shows quantitative model and Figure 8 shows simulation result. This graph shows volume of slave and ivory trade from Zanzibar, but not from East Africa other than Zanzibar. Zanzibar gradually involves direct trade of slave and ivory in mainland and volume of trade rapidly increasing by this direct involvement of Arabic slave and ivory merchant protected by Sultan of Zanzibar.

(4) Zanzibar Empire to Colonization by England and German

Colonization movement by Western Europe spread to East Africa by France, then German and England. France mainly colonized Island. Newly established German Empire wishes to establish Colony with strong leadership of Bismarck. Although British Empire was hegemony of the world, but relation between German and England is good and British Empire rather supporting activity of colonization by German in Africa. German borrows Tanganyika from Zanzibar and then colonized. This colonization is buck upped by Government of British Empire, however, some British does not want activity of German and rather established British colonies to East Africa, and some are success. British borrow Kenya from Zanzibar and then colonize, as well as they control Zanzibar indirectly with protected country. While German rather controls colonial country directly with powerful military and police power, British control both directly and indirectly with powerful middle class government staff from their British Federations and private army. Policy of British Empire is indirect to with private army of firm, British East African Company in this case. Only when bankruptcy of British East African Company, Government take over and shifting to direct control.

Medieval system to control people by tribe chief is vanished and adapt directly or indirectly governed by British or German. However, their main purpose to governing is protecting immigrant

for plantation farming. Portuguese occupied and control trade city but not control mainland and make plantation farming in East Africa. They only involve trading. However, German and British develop plantation firm in mainland and produce many raw material for industrial goods, including jute, indigo, coffee and tea. Industrialization gradually makes machine for using plantation farming such as drying coffee beans and threshing machine, but mostly rely on slave labor.

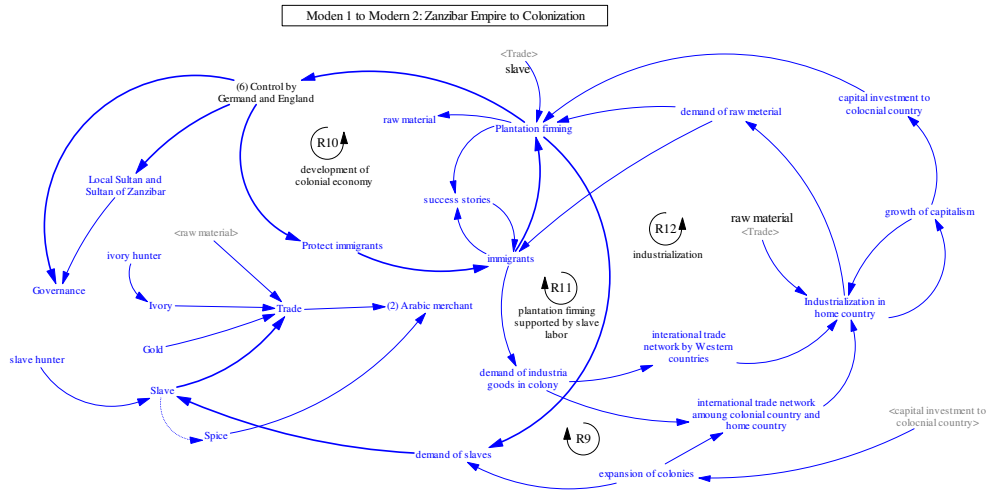


Fig. 9: Fall of Zanzibar Empire and shifting to Colonization (qualitative model)

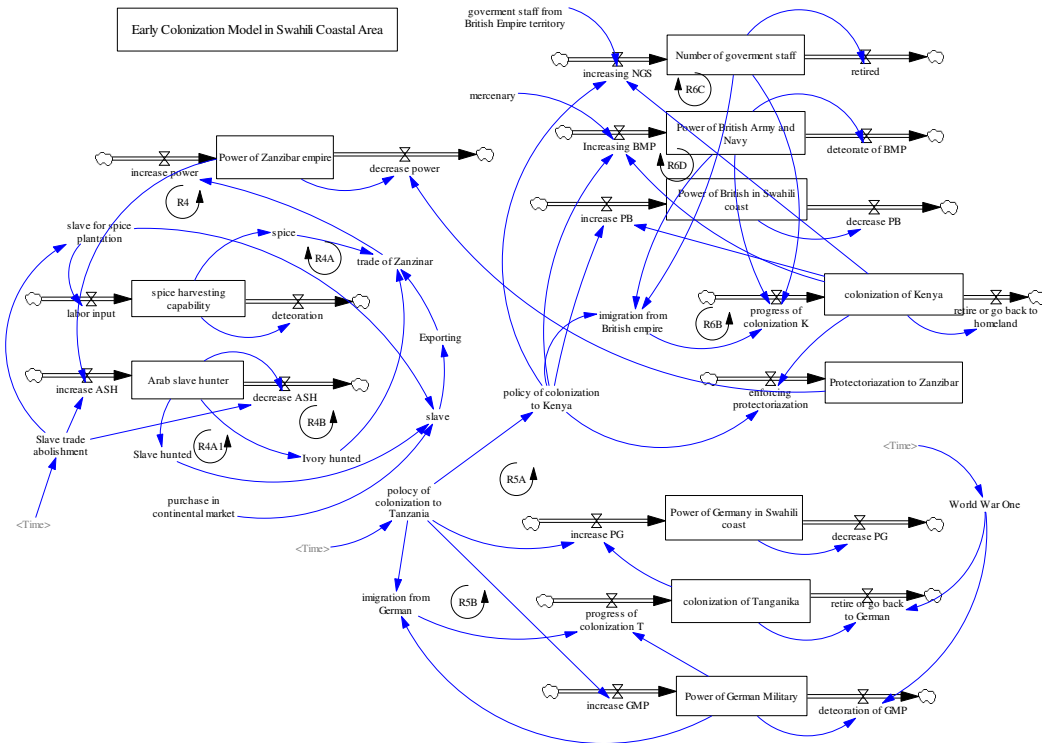


Fig. 10: Fall of Zanzibar Empire and shifting to Colonization (quantitative model)

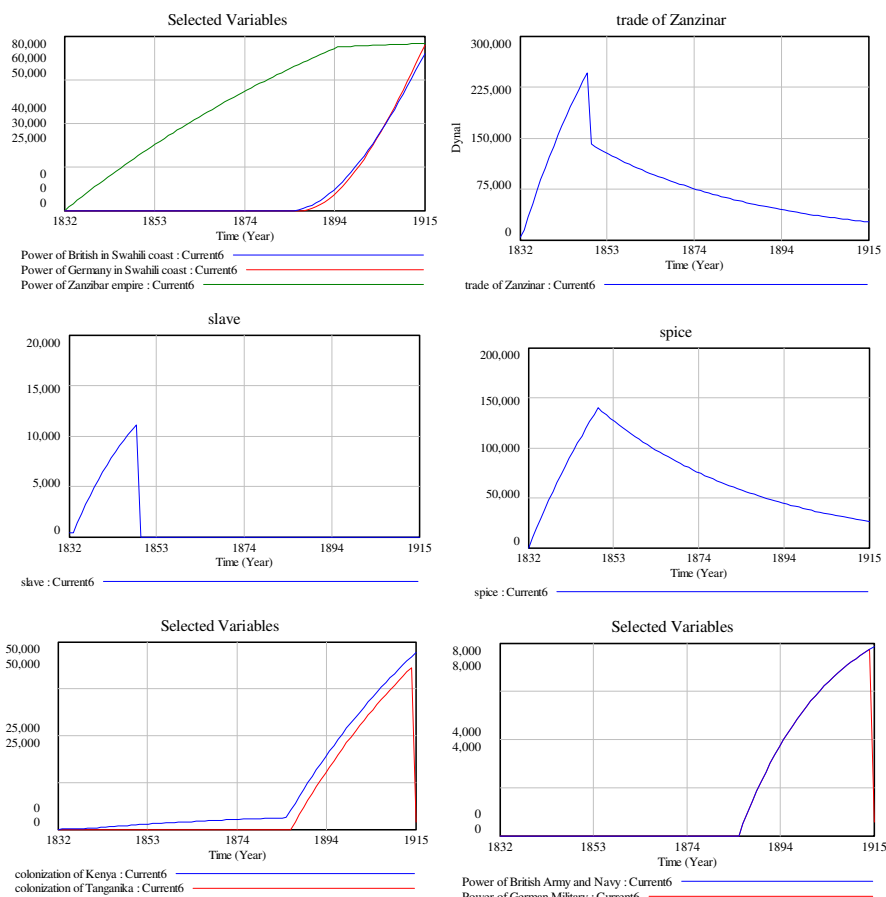


Fig. 11: Fall of Zanzibar Empire and shifting to Colonization (simulation)

Trade of slave vanished by British in 1827, *3) but other western countries against abolish of slave trade as well as using slave labor. Slave smuggling trade continues for several years after British insists abolishing slave trade to Sultan of Zanzibar. Plantation firm shift to using labor of local people paying wages, as well as accept cheap labor immigrant from India for tea leave picking.

German colonized Tanganyika is occupied and shifting to British colony after World War I. British take over coronial system, however, plantation firming is less developed.

Figure 9 shows falls of Zanzibar empire and rises to colonialization in Swahili coast by British and German. Governance of local sultan is only nominal but not has real power. Governance system of British and German are bit different and British rather use indirect control for cover shortage of middle class bureaucrats while German rather forwarding direct control under strong military and police control. Also, development is forwarded by demand in their home country and trade volume of raw material exceeds trade volume of salve and ivory, specially after abolish of salve trade. Immigrant is increasing by success story and protect by local government. Increasing of immigrant increasing demand of industrial goods imported from home country as they hope to spend same life style of their home country. They import cloth, for example, but cotton and indigo, raw material for these imported clothes is actually produced by them in their plantation firm. Factory in their home country make string from imported cotton, then wave to cloth and dyeing with indigo, also imported.

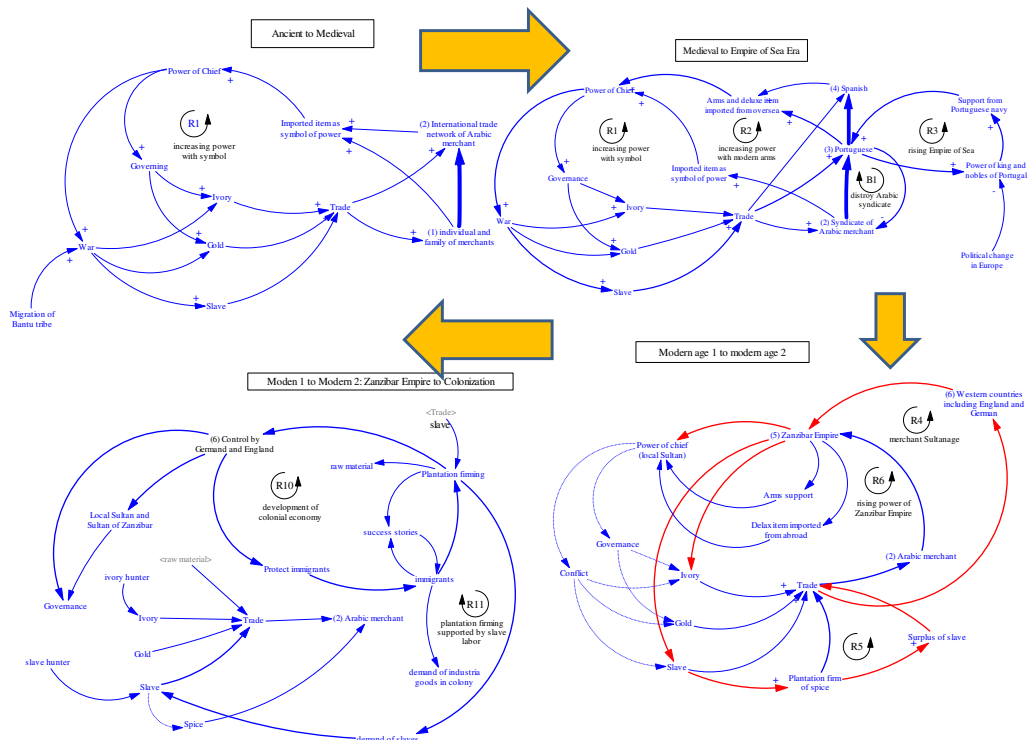


Fig. 12: transition of governance and trade in Swahili Coast

Figure 10 shows colonial governance system and Figure 11 shows simulation results. This model does not show investment mechanism to plantation firm but explained in later section. For a meanwhile, this model rather focus on success of colonization stands on quantity and quality of government staff arranged from home country and colonial country as well as military and police power also arranged from main land and colonial country.

I show how change of history with change of system in mainland Africa and relation with world trade system and colonialization system. This shifting of systems may show like add new feedback or delete old feedback, like Figure 12, or evolving/transform like this. This is one of way to explain history and this is sample of how system of history has been changing in Swahili Coast of East Africa. *4)

4. Business model and key success factor approach

Second approach to explain history may adapt sort of business model typically believe in those day and find what may key success factor and why some country can success while other fails. One of success business model in 16th century to early 20th century is actually invented by Arabic in 8th to 9th century, so called sugar plantation firming using slave labor. Arabic starts sugar plantation in today's Iraq. Problem of sugar plantation firm was quality of labor, in term of slave who can bear in hard work under high temperature climate and Malaria. Arabic finds African slave can bear to this labor environment and start to use African slave. (However, increasing number of African slave cause Zenji revolution.) Key success factor of sugar plantation was using African slave.

(1) First version business model

This business model was adapted by Portuguese in their first colonial land Azores Island in 15th century (1419) before they explore to Africa and Asia. At that time, sugar was produced using white slave and shipping directly to market in Amsterdam. Portuguese adapted sugar plantation firm using African slave labor in Guinea (1444) and find more productive when cultivate sugar cane in high temperature and using African slave who can bear high temperature climate and Malaria. Also

condition of using slave in island protects from their revolting. However, before Portuguese find sufficient land for large scale sugar plantation, Spanish adapted sugar plantation firm business model in their New Land (middle and South America) and success to produce huge wealth. Spanish starts sugar plantation model using African slave in their island colony in Caribbean Sea. Then they enlarge this model to mainland. Portuguese adapt this business model in Brazil after they lose their oversea territory with merge of Spain and Brazil is only major oversea territory for Portugal when they independent from Spain.

First business model is produce only sugar with plantation firming but gradually this sugar oriented business model adapts to other products, such as Tabaco, coffee, tea, cotton, indigo and jute. Portugal and Spain can success to adapt sugar plantation firm business model, however, could not much success to expanding other plantation firm products. Rather, German and British can success to expanding other plantation firm products including coffee, tea, chocolate and cotton.

Sugar was actually deluxe item using medicine and high nutritious item until 18th century. Sugar is item only rich people can consume, that means only royal family and noble can consume in those days. Also tea was medicine for maintain health and long life, that also limited to middle class. Anyway, rich people mean mainly royal family and nobles, and very few bourgeois merchant who link with royal family or banker. Sugar plantation oriented business model adapts mainly for produce products sale to those kind of consumer. This may called first version of business model.

(2) Second version business model

However, independent of Holland and decline of Spanish Empire cases increasing of middle class and bourgeois mainly in Holland and England. Those newly arises class crates economic power and increasing demand of deluxe item including sugar, tea, coffee and Tabaco. Sugar is now mainly produce for such middle class consumer. Scale of economy and increasing demand create business opportunity of sugar plantation and colonial country of Spain (mainly Caribbean) enlarge cultivation as well as war for capture colonial land heated up.

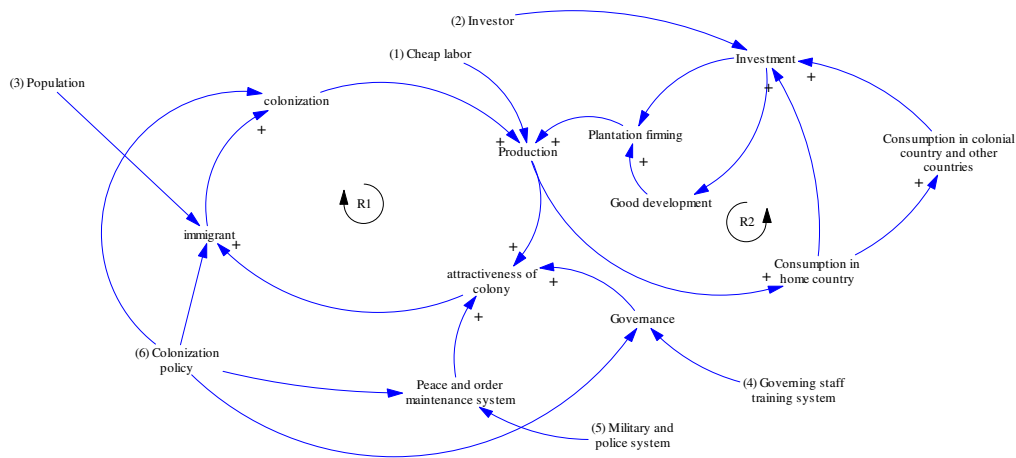


Fig. 13: business model of colonization

Increasing of middle class economic power also creates demand of cotton and indigo for cloth of labor and middle class. Cotton is much comfortable for labor specially work in tropical area as well as cheaper than linen. Linen and wool was major item for cloth of people in Europe but gradually even European shifting to wear cotton clothes. This shift cause industrial revolution first in England and escalating consumption of raw material (cotton and indigo). Now, slave labor intensive plantation firm business produce also raw material (cotton and indigo). This model is second version. Key success factor for shifting first version to second version are, bourgeois who may invest to

plantation firming (and import products produced by plantation firm), population who may immigrate to colonial country for plantation firming (and related business), and guarantee system to activity of immigrant.

Table 1: comparison of policy and interests among western countries

	Key Success Factors	Portuguese	Spanish	German	British
(1)	Cheap labor (African slave)	They first adapt African slave for sugar plantation firming but shifting slave trade after they find slave trade is more profitable.	Start sugar plantation using African slave after native Indian decrease and enable to use for slave labor	Using African slave labor before abolish of slave trade. Still they can maintaining competitive advantage as Africa labor is relatively cheaper	They used contracted white worker from home land in Colonial America, but shifting to use African slave. Use slave in African colony but shifting cheap labor from India after abolish of slave
(2)	Investor	Royal family and few noble. Royal family is biggest investor, however, in total, investment amount is not much.	Royal family and few noble. Royal family is biggest investor, however, in total, investment amount is not much. Added more, king has	Kings and royal families are not much rich until establishing German Empire. Total number and capability of bourgeois are big.	Bourgeois majority and total capability of investor is quite big
	Plantation firming	Do not have much interest	Do not have much interest	Have strong interest	Have strong interest
	Product development	Do not have interest, rather focus to buy local products and sale to European market (trade) than develop new products. They success first version business model of produce sugar and export to European market, however not develop other products. They success slave trade and that may one of reason they do not try to develop new products produce in colonial country.	They imitate sugar plantation business model and adapt to Caribbean colony. However, royal family oriented colony management only have interest to products sold to other royal family and nobles. They do not touch to develop products target to sold middle class consumer.	Have strong interest. They adapt success business model of British and develop luxuries including coffee and tea, and raw material including cotton, jute (of rope and bug) and indigo.	Have strong interest. Developer is bourgeois and know well needs and seed of customer who belong same class. They develop many products. They lose politically competition with Holland who focus trade of value items such as spice that is not heavy but expensive. Therefore, British has no choice but focus to trade bulk products that is heavy and less expensive. Then they
	Needs and Seeds of products	Main market is not in Portugal but Amsterdam and difficult to know needs and seeds of	Main market is not in Spain but Amsterdam and difficult to know needs and seeds of	Close with main market and know needs and seeds well	Close with main market and know needs and seeds well
(3)	Population who may immigrate to colonial country	Population is few and immigration to colonial country cause de population (with civil war and war in Europe)	Population is relatively few and cause vacuumed of indoctrination by expansion of colony and population flow to immigration.	Population is relatively huge and not have colonization country. That can possible to focus to their colonization country as well as supply of raw material contributing	Not much population in main land, however, quite big population including colonial contrives. Raw material produced by immigrant contributing indoctrination of
(4)	Staff of colonial government	System is weak as well as shortage of staff because only noble appointed by king	System is weak as well as shortage of staff because only noble appointed by king. They try to cover weakness with missionary and their system.	Efficient high education system training not only noble but also middle class who talented for colonial government staff.	They have efficient and effective education system supply colonial government staff as well as they establishing education system in their colonial country. Staff is appointed
(5)	Military and police system for maintain peace and order of colony	Weak for small population and fail to modernization of military and police system. They occupied and control only on point (trade center) in case of Swahili Area.	They have strong army and navy, though too much covering area as well as not much interest to focus on protect sea lane between India and Spain via Africa. Also their army focus to battle in Europe. Added more.	Bismarck create strong modernize military system. They establish military and police merged system control peace and order of colonial country.	They have mercenary and official military in East Africa. They establish cantonment near by trade center and prepare to control in emergence.
(6)	Colonization policy	Weak and not much clear colonization policy. They can establishing colonial policy in Brazil, however could not establish other area because colony transferred to Spain.	They do not have much strong colonization policy to East Africa and much more interest to new world (America).	Bismarck keep maintaining good relation with England and colonizing East Africa. They are behind the race of colonization and aggressive to colonization.	Take aggressive colonization policy for protect to take over other countries including France and German in East Africa.

(Note: this table shows main characters of major countries for version 1 and 2 business model. For showing major differences, not list up French, Holland and Belgium. French and Holland have similar character with German and England and categorized adapter of version 2 model.)

Spain and Portugal could success for first version. However, they could not success to shifting to second version of the business model. Second approach for explain history may shows why British and Dutch can adapt and success with second business model while Spanish and Portuguese could not success to shifting even they can success in first version.

Figure 13 shows this brief qualitative model. This model shows 6 key success factors categorized into two characters related with A) colonial country and B) home country in Europe. 1) cheap labor that means using African slave and 6) colonization policy are entirely subject of category A), and 5) Government staff training system may rather subject of category A) but between A) and B). 2) investor in home country, 3) population who may come to colonial country from home country for business and plantation firming are subject of category B). There is not significant different of structure between first business model and second business model, however, strength of factor is different. 1) Investor is weak, 3) emigrant is less, and not have strong power and capability of 5) military/police system in first version. This difference makes weak feedback loop in first version while second version has strong reinforcement feedback loop of R2 that drives R1 more strongly.

Table 1 shows comparison of first version colonization business model and second version with key success factor mentioned on Figure 13 as attitudes of typical countries. Portugal and Spain belong to first version business model and German and England belong to second version business model. This list does not including France and Holland but they belong to second version business model category.

(3) Key success factors of business model

1) Labor

The feedback loop of R1 on Figure 13 has 5 key success factors. First key success factor was using cheap labor cost and colonial model solving this issue with using slave labor. Spanish use native Indian (local people already lives in South America and Caribbean Islands) as slave labor first but population drastically reduced by ill carry by European. Spanish replace shortage of labor with imported African slave.

In Colonial America, immigrant plantation owner use contract white labor from England for produce Tabaco first. But gradually they replace with slave labor, as slave labor is much cheaper, and contract white labor could not force to extend their labor period. However, slave labor is stable and could keep using much longer (Suetake 2013). Using cheap labor (slave) is key success factor of colonial business model until abolish of slave trade in 1833. After abolish of slave trade, still British can success to maintain cheap labor for using immigrant from India in case of East African tea plantation firm.

2) Investment

i) Investor of home country

There is two reinforcement loops one in mainly colony side and other mainly in home country side. In home country, feedback loop increasing investment to colony (plantation firming) leading increase production of raw material in colony and enhance export to home country. This enhancement further develops industrialization of home country and increasing demand of raw material. In this R2 feedback loop, investment to colony and production are increasing. This mechanism show more detail on module of home country investment in Figure 14. Before industrialization, competition of investment heated on between high society and middle class. Member of high society is king, riyal family and nobles. They are biggest sponsor of investment to foreign trade and their investment focus to value item. Value item means not heavy but have expensive item typically spice and sugar, then including tea and coffee. Those item are consumed limited to riyal family and noble, and limited super rich merchant. If value item is sold, profit is huge, however, limited of consumer. Also not so heavy, these items can carry easily or could get huge profit from small volume. King of Portugal and Spain have monopoly power of trade. Those deluxe items sold to market of Amsterdam to other royal family and nobles, and super rich in Europe. Investment feedback loop focus to find such deluxe item for trade in early business model. This feedback loop work mainly on value item market on Figure 14.

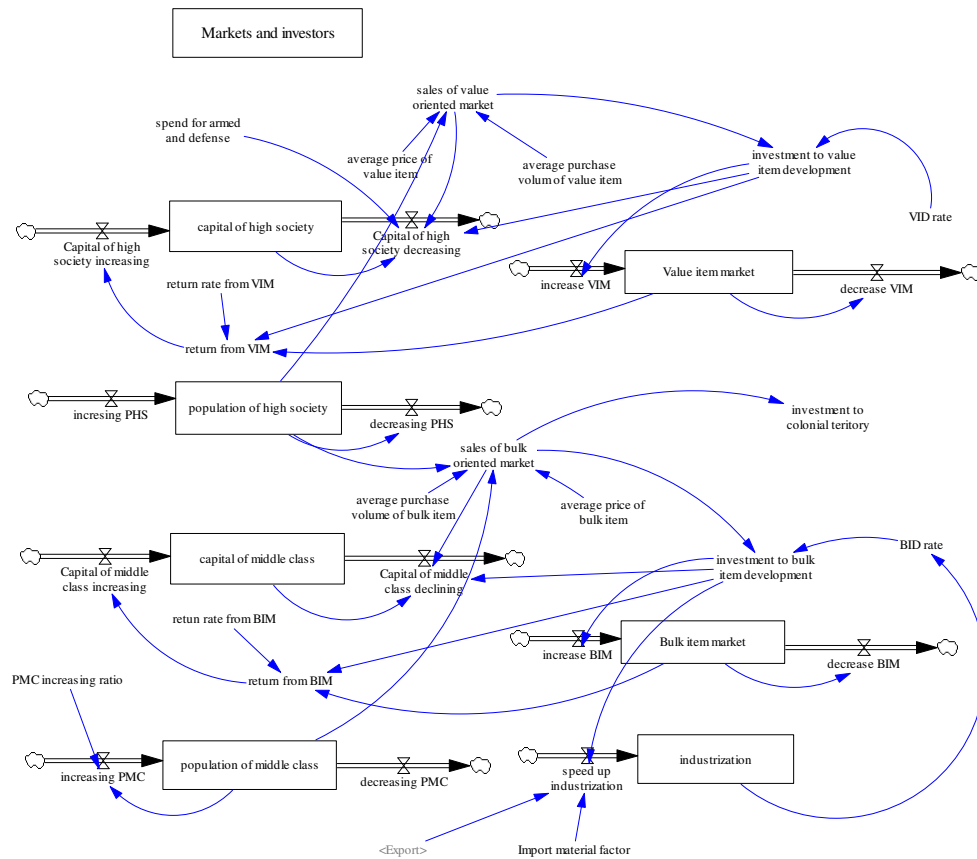


Fig. 14: Investors in home country

Those high society investors also invested to bulk market. In early time, economic power of middle class is weak. Therefore, market rely on investment of such superrich. However, after independent of Holland from Spain, increase of middle class investors accelerating development of bulk item market. Bulk item is heavy and less expensive items including wheat, wood, wool and cotton clothes. It requires reliable system to transfer as well as need to sale huge volume for get sufficient profit. However, those items are so called commodity and easily find many customer who want to buy. Growth of value market increase economic power of middle class. Majority of investor is middle class and they know needs and seeds of bulk item and bulk market so well, because customer is mostly themselves. On the other hand, investor of value market sometimes does not know well about seeds and needs of value market. They are rich and basically do not need newly value item.

This reinforcement feedback loop on bulk item market grow faster than value item market, because increasing population of middle class is faster than population of high society. Also, high society must waste their capital for war and defense, that sometimes so easily to bankrupt and drops them from high society. This reinforcement by middle class further enhance with industrialization in version 2 of business model. In this feedback loop, investment to colonial country increases, links to module of plantation firming in colonial country.

Therefore, character of investor is different with first version colonial business model and second version. On first version, investor is king, royal family and nobles, while middle class civilian in second version colonial business model.

ii) Plantation firming

Figure 15 shows plantation firming in colonial country. This module is detail of “Production” in Figure 13 and links with two reinforcement loop of home country and colonial country. Increasing investment to colonial country is mainly invests to developing plantation firm and developing new item produce in plantation firm. Since increasing middle class or middle class become rich, they gradually have purchase power of deluxe item. Also deluxe item becomes commodity. For example, sugar and tea were deluxe item only royal family and noble can consume. But expansion of sugar plantation firm produces more volume and reduce price. Now, sugar and tea are commodities any middle class can consume. Demand of sugar and tea are increasing. Immigrant considers produce sugar and/or tea at newly colonized country as easily sales item. In this way, they find new spices of tea fit for plantation firming in India and then introduce in East Africa. If success to develop (or rather find) new products, investor may invest to produce such item, as well as plantation firm owner eager to produce in his plantation firm. Rich plantation firm owner also become investor.

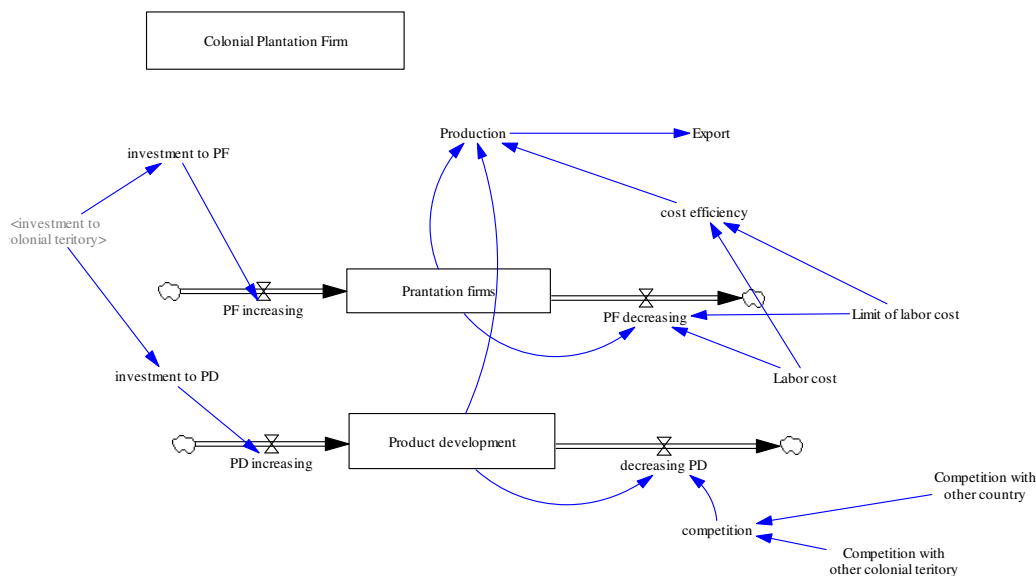


Fig. 15: Plantation firming module

On first version colonial business model, plantation firming produce only single products (sugar) and product development is weak, while plantation firming produce multi products in strong and eager product development in second version colonial business model. This production of multi products also enforces strength of feedback loop R2 in Figure 13.

3) Emigrant

Not only growth rate of immigrant but population of country related emigrant may key success factor. Immigration from few populated country may cause vacuum of industrialization in home country. For example, 3 to 5 thousands of people immigrate to India (Goa) every year during early 16th to later 17th century from Portugal. This figure is official recorded and actual emigrant is more than this figures. Immigrant to Brazil from Portugal during 1620s is around 8 thousands per year. This figure is also official recorded and actual figure may more than this. Population of Portugal during 1527 to 1532 is 1.4 million. It means around 1% of population keep flowing out to colonies (Sato 1997, Hasegawa 1997). This huge emigration cause vacuumed of manufacturing specially case of Portugal. Royal family and elite class occupied business chance and industrialization opportunities in home country, skilled and talented human resources leaves to colony for find

opportunities. This flow out of human resources causes depopulation and less opportunity of industrialization in home country. This is one of reason why Portugal was behind industrialization and could not much success to establishing relation of colonial country. Because skilled waver is absent to flow to other countries, even colonial country produce and ship cotton and indigo, their home country could not manufacturing products from raw material. (Of course one of reason is persecution to waver for reason of religion, and they cannot find success opportunities in home land. Since so few waver in Portugal, they export wine and buy clothes from England.) In such absent of manufacturing system in home country, it is difficult to crate feedback loop R1 and link to R2.

I have survey in East Africa during 2008 to 2014 and find many firm owners (actually their ancestor) were come from Scotland and Ireland in UK, and New Zealand and Australia in colonial country but find very few owners come from England or Wales (Suetake 2013). It means, in British Empire, immigration is not only from home country but also from other colonial country. This is reduce shock to home country for avoid vacuum manufacturing capability of home land and depopulation. Industrial revolution help to increasing population growth but emigrants are not high skilled people, but rather second and third son of farmer or investor himself. This style emigration does not cause vacuum of manufacturing. Skilled people for waving still keep stay in home country and contributing until emerge of industrial revolution that machine replace skilled waver. Added more, those emigrants focus to plantation firming and shipping tea and coffee (raw material) to England. This style also enhances and accumulates knowledge and skill to produce and supply raw material stable. Early emigrant from Portugal focus to work as trader or solders, but not settle and involving plantation firming. They may find valued tradable items, but not make that on ensure stable supply.

In case of German, basically they have huge population and colonial country is very limited. Emigrant from German to colonial country is not causes any depopulation problem.

Difference on population of home country may also characteristic for weather they could evolving from first version colonial business model to second colonial business model.

4) Governance (quality of government staff)

Second key success factor is attractiveness for immigrant. If attractiveness of colonial country, they can accept more immigrant and increasing production, as among success story further enhance attractiveness of colonial country. This character may relates mainly two items, quality of colonial government staff (or governing system) and police system maintaining peace and order of colonial society (though white immigrant oriented). Based on these two systems, attractiveness would be enhanced and immigrant is enchanted. If colonial policy is focus to expanding, colonial government try to accept more immigrants. But it is necessary as home country (including colonial countries) has enough population for emigrate. Figure 16 shows detail of attractiveness for immigrant and how colonial governance system and military/police system support that attractiveness. However, before explains detail, first consider impact of population for emigrant.

Second issue is quality of colonial government staff. Portugal lacks the quality of government staff. Most high class staff is appointed by king, and this means only appoints noble and high society people. However, in case of Portugal, their governing area is small and no need complicated huge governing system. But this limitation is one of reason Portugal could not success colonize in East Africa. For covering weakness of governing, specially intelligent and promotion, they rely on missionary.

Gradually, education of university shift to training priest to training of government staff (or their education system attract people who become government staff). British establish education and training system first for control their Indian territory, but this system produce more Indian staff who can work as middle management staff for other colonial country.

German has sufficient education and training system for middle class government staff as well as their territory is limited. In this manner, colonial government tries to maintaining attractiveness for support to business of immigrant.

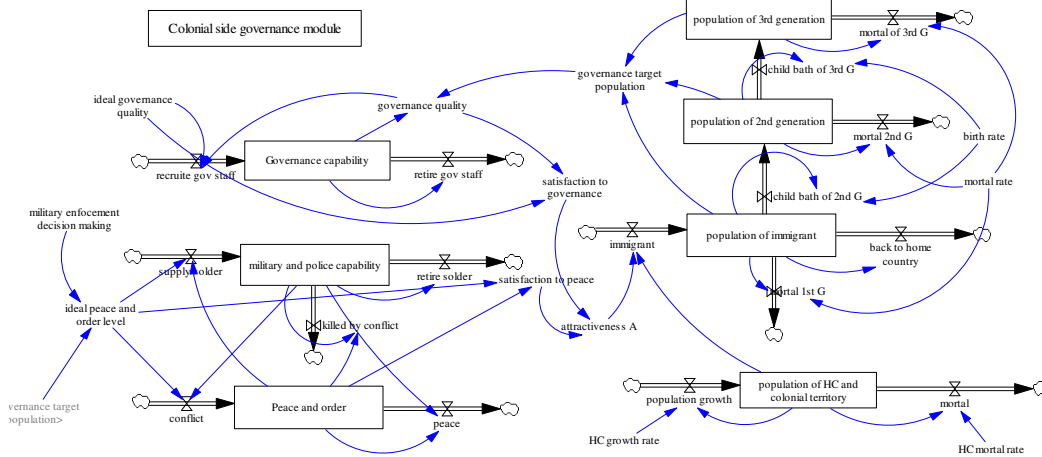


Fig. 16: Governing capability and attractiveness of colonial country

5) Governance system (maintaining peace and order)

Major issue for maintaining colonial system is how colonial government can maintain peace and order between local, slave and protect white immigrant. Basically, mainland of Africa is place of political chaos with violence and one of factor is military and police system for control this situation. Portugal protect trade center with fort and solders. Their fort built on island or peninsula from main land that easily protected from enemy attack and revolve of slaves. In remote island or peninsula, slave of same tribe could not gather and contact with their tribes in mainland. Thus they could not have chance to revolve and get support from same tribe in mainland. In case of East Africa, Portuguese do not tempt to large scale plantation firming, rather focus on trade. Thus area for protect is limited and also easy to protect. In this situation, they do not need huge army as well as strong efficient governing system.

In case of Tanganyika, German built army camp and strong police station for protect white immigrant as well as maintaining peace and order. With this strong military and police force, they protect from revolving and resistance of native and slave. Since Tanganyika is only major colonial country German has, they can send relatively huge military force.

In case of British, expand of colonial country cause shortage of military force. They cover this weakness with mercenary hired by East African Company. This system reduce load of British Army of overseas. Also, they do indirect control that governing local people via old governing system, and British government only control Sultan with treat of military and navy. This indirect system also helps to reduce load of military. Also British establish cantonment area near trade center and they can prepare to take military action any time to trade center nearby. In this manner, colonial government enhances attractiveness in term of peace, safe and protected from violence, resistance and revolution by natives.

6) Colonial policy

Actually all western country has clear and consisted colonial policy though 16th century to 20th century except German. However, main stream of colonial policy was driven by king and royal family in first version of colonial business model while middle class and rich merchant dives in second version colonial business model. Basic need of colonial policy is protect profit of home country against competitor as well as protect profit of immigrant and guarantee safe of business. In

this term, colonial policy is more aggressive in second version for expand colonial territory specially after industrialization and home country requires more raw material from colonial country.

(4) Simulation

Figure 17 shows 200 years trend of changing immigrants and army/police force for maintaining peace and order of colonial country in second version colonial model. Target of protect immigrants is up to 3rd generation in this model. With increasing of immigrants, but mostly expansion of territorial area, army and police stay in colonial country may increase. In this scenario, government of home country sends huge army and police in first stage for establishing governance system of colonial country. Immigrant also rushes to come to find new opportunity of success. However, success rely on how products developed for plantation firming. First category of products that confirm in other colonial country may also success to produce in first stage. However, immigrant comes to next may also produce same products and compete each other. This may reduce attractiveness for immigrant and increasing of immigration may slow down. After few decades, new products fit for that colonial country may develop and again increasing attractiveness for immigrant in case of tea and coffee in Tanzania and Kenya. In case of Kenya, improving agriculture technique and establishing brand name (Kilimanjaro coffee and Kilimanjaro Tea) contributing increasing of production.

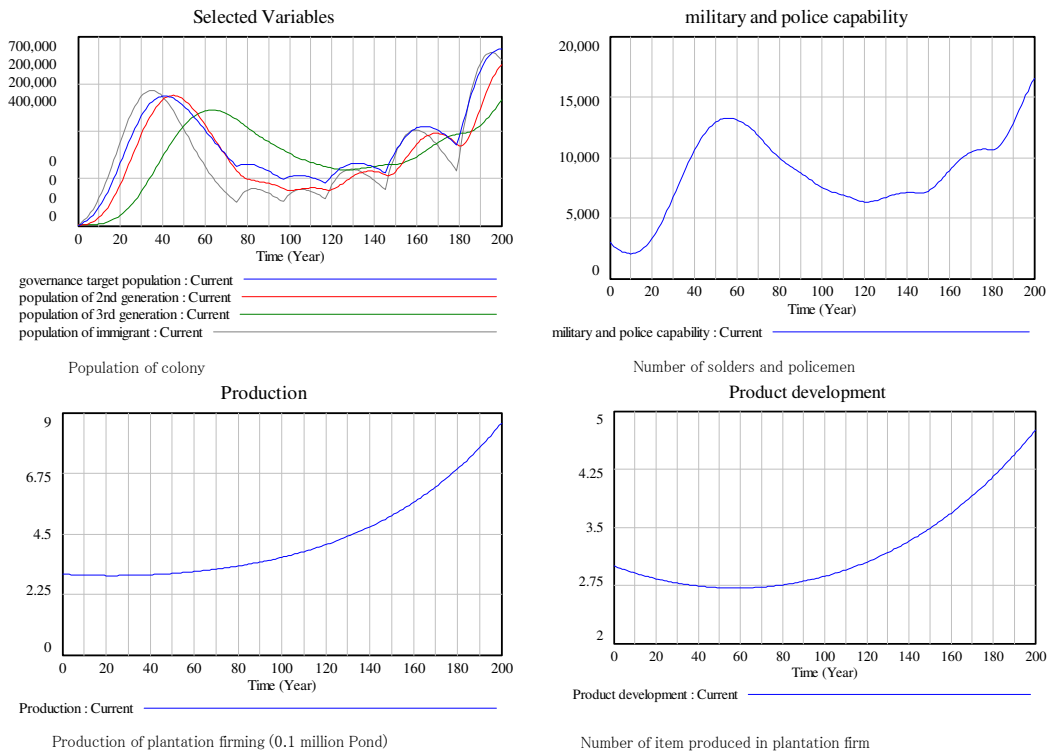


Fig. 17 Colonial country simulation result (England and German)

Figure 18 shows comparison of first version business model with second version. Although Portugal and Spain did not establishing huge area of colonization country in East Africa, however, if in same condition, I believe still they cannot success because they may not adapt military/police and cantonment system for maintaining peace and order, could not enhance quality of government staff as well as weakness of industrial relation between home country. Even Portugal and Spain may try to establishing colonial country in East Africa, they may not success until they adapt second version business model. This is how I can explain history of East Africa in 19th to 20th century in term of key success factor and business model. I show this difference with change parameter of less population in home country, less investor invest to colonial country and weak linkage between home country

relation with support raw material. As conclusion, success of colonial country depends on industrial success of home country. *5)

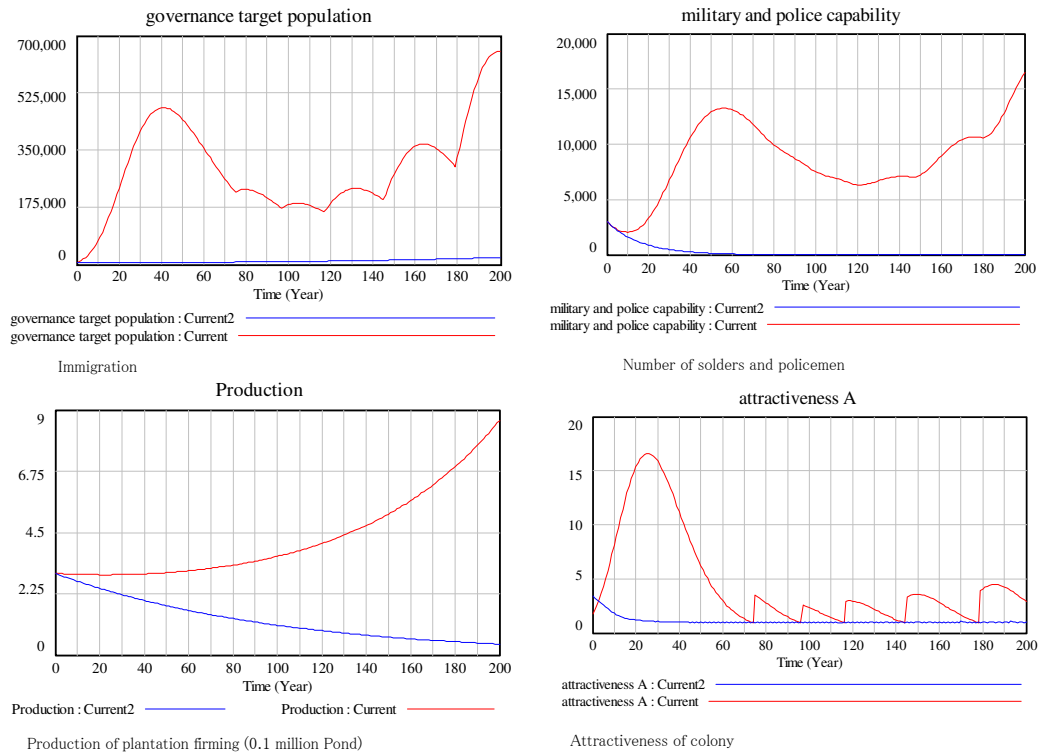


Fig. 18 Colonial country simulation result (comparison with England and Portugal)

5. Conclusion

In typical high school education of history, student may easily misunderstand as international trade network system was established by European after Vasco da Gama find route to India. Although they contributing for establishing base of modern international trade system and based of capitalism, however, as I already explain in section 3, that is not true. It is rather:

- International trade syndicate of Arabic merchant was already established before arrival of Portuguese to Asian market
- Portuguese rather take over infrastructure of their trade network violently with navy power and
- Spanish connect route to America (Mexico) and Asia, and real world trade network was established

However

- in African mainland side, system change is limited because Portuguese does not change the structure and system of mainland Africa
- Change of system in mainland caused by Arabic (Osman) introduced federal load system appoint local tribe chief as Sultan and
- West Europe country introduce colonial governance system supported by strong military power

I show this change of history with transfer and shifting major loop from one to another, add new feedback loop and interrupt with old feedback loop. This way of explain history shows as evolving model by time. Also this way of explain history shows how mainland Africa was changing after

intervened with European power after 16th century or why they are not change until intervention with Osman and West Europe. SD model may show clearly about mechanism of those interventions.

Second way to explain history is adapt sort of success business model and compare why some country could success while other could not. I use colonial business model, though this model also evolving from first version that is mono product plantation firming to second version that produce multi products produce. Also this SD model shows change of economic system and structure in home country dives colonial socio-economic system. If adapt this approach, may be view of history may as Marx think (change of economic system requires to changing social system). Sometimes this approach for explain history is also frequently observed. SD model has rich experience to explain business model in this way.

Both ways explain history more clear or explain history as change of system is more important rather than simply explains what happen in history. History of Swahili Coast of East Africa may not be major topics of world history. Source of power for tribe chief could not apply to explain history of medieval Europe. It may rather sufficient to explain with how system and structure of capitalism was changed based on Wallerstein explains already.

However, I believe we can explain history using SD model and this paper proves this is possible and could explain more clearly about mechanism when history changing. Also using SD model for explain history can avoid misleading caused by view of history as event chains. Lastly, I hope history teacher and SD practitioner apply SD modeling methodology and find mechanism of changing history. We, people do not know what happen in future and how our system may change. One of powerful understanding future is understand how history changed and adapt mechanism of change to expected change to future. Therefore, study history using SD model is very important subject.

Notes:

- 1) Arabic merchant build city with rampart, however, made with coral, not rock, as well as very thin, only 30 to 40 cm. This coral wall is not intends to protect from attack of canon and gun. They expect to protect attack by arrow. That is reason why Arabic fort so easy to destroy by attack of Portuguese. On the other hand, fort built by Portuguese is very different. Wall is very think, at least 3 meter and some are more than 5 meters think protected by cannon.
- 2) This simulation including impact of Zanji revolution and reduce import of slave from East Coast of Africa based on Hall (1996). Major shipping destination of slave and ivory from East Africa is to Middle East during ancient to medieval era. Major demand is slave labor of sugar plantation firm in today's Iraq. Many slave use for produce sugar, however, this accumulation of slaves from East Africa cause Zanji revolution in 9th century. For maintaining trade balance and avoid revolve of slaves, Arabic merchant limited import of slave from East Africa (Hall 1996).
- 3) First Slave Trade Act was passed the British Parliament in 1807, however not perfectly acted until 1827. In 1827, British announced assume pirate activity who commits slave trade and in 1833, Slavish Abolish Act was established and officially all slave trade is illegal in British Empire. British push this abolishment of slave trade to other country and gradually other country follows.
- 4) Data on export of slave and ivory relay on following information resources:
Sheridd, Abdul, "*Dhow Cultures of the Indian Ocean*", Hurst, 2010
Gilbert, E. "*Dhows and Colonial Economy of Zanzibar 1860-1970*", Ohio University Press, 2004

Data and information source of society and power structure relay on:
Martin, Esmond Bradley, "*Cargoes of the East*", Elm Tree Books, London, 1978
As well as Hall (1996), Suerake (2013), Hasegawa et al., (1997) and Sato et al., (1997)

5) This colonial business model excluding population of local people and slaves.

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