

# Simulation of an Economic Policy on Second Life Using a Conjunctural Analysis Approach

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**Abstract.** This paper intends to define an economic policy that does not compromise the coordination between the 4 main sectors of an economy: the real sector, the public sector, the exterior sector and the monetary sector. The subject is Second Life (SL) a totally virtual world that is starting to occupy a great economic place especially with e-commerce. For doing so, some data are arbitrarily chosen as done and projections are made from them. Data are expressed in billion of Linden dollars.

**Keywords:** economic policy, Second Life, importation, exportation, open monetary policy

## 1. Presenting this economy

Let's say a virtual economy, Second Life (SL), formed by virtual little islands accessible through Internet with the website: [www.secondlife.com](http://www.secondlife.com). Within this paper, it will be considered as a country regarding to its interaction with the whole world. To access SL, it is necessary to subscribe to an account to which are related a pseudonym, an avatar and the unlimited right to visit all the communities of SL and to interact with other subscribers of SL. A paying account gives the right to acquire virtual lands and allows the common visitor to become a resident. Nowadays, more than 8 millions people through the world had already subscribed to an account on SL. A person who uses SL can then be either resident or non resident. What can be done there? With an avatar, it is possible to follow course, buy a little island, and build one or many house(s) for living, reselling or commercial investment. It is also possible to meet people, buy goods and services, invest in virtual real estate, follow courses etc. Embassies are even found on SL as the one of the Maldives Islands. More over, about 60 universities around the world of which Harvard and Stanford are represented there via virtual campuses.

## 2. The productive sectors

Restrictive annotation ?

At first sight, products offered on SL are services. Meanwhile, this hypothesis would be alleviate because goods from primary and secondary sectors (presented in source data of this paper) and made up on SL will be considered as indicator of the state of the available resources. Indeed, it is virtually possible to reproduce all the aspects of real life of which the production of primary goods for end consumers. By Example, it is possible to get a virtual pet to feed.

## 3. The foreign trade

Definition of import and export of goods and services in the framework of this country. An import is realized each time a resident on SL agree to give a good or service to a non resident

in exchange of a defined amount of money (Linden Dollar). An export is realized each time a resident of SL agree to give a defined amount of money (Dollar US) to a non resident in exchange of a good or service. Those transactions are at their minimal level regarding to the number of people on SL and the economic issues.

#### **4. The weight of the state in the economy**

Second Life is supervised and managed by a laboratory based in the State of California in USA: Linden Lab that will, there, take the place of the government. This government will nearly never interfere in the functioning of SL. This way, most of the services available on SL are created and managed by the residents.

#### **5. Organizing taxation**

An internet user on SL pays subscribing fee only one time according to the advantages related to his account: those are internal income. Custom taxes are taken regarding import and export transactions. There is a state agency that provides commercial services (building construction) of which incomes are classified under the section other incomes.

#### **6. The monetary statement**

The national money is the Linden Dollar (L\$) exchangeable at the fixed rate of 0.0019L\$/1\$US or 526.32L\$=1\$US. It is a virtual money; it cannot be touched but it can be used, as real money, to ensure any payment in full discharge in the virtual limits of SL. There is a service of assignment of right of user for the national currency named LindenX. It is considered as the Central Bank. This institution has a real power with regard to regulation and warranty of the coherence and credibility of the currency L\$. As a matter of fact, it has the right to limit deal over foreign currency, to stop or reverse an exchange deal. The LindenX within its function of creation of virtual money has a similar function as commercial banks in their early starting (early 19th century).

**The stake !** SL would have been a central place of e-commerce. Till now, all the international main brand – Nike, General Motors, Toyota etc. – are represented through marketing windows on SL. They are waiting for good signals from internet users and the system that support SL to get launched on SL. In order to accelerate the process, the economic activity conducted through e-commerce and based on export and import of goods and services via SL should be helped, warmed up, encouraged. SL would thus be an intermediary point between two remote consumers. We could define the following path:

1. Identify the issues
2. Fix targets
3. Choose a policy to implement
4. Present the results of the simulation

#### **The actual presentation of the work**

1. **Identify the issues.** Starting Hypothesis about the general state of this economy. It is a healthy economy in an expanding phase of its business cycle that should growth while restoring exterior equilibrium. The current account imbalance needs to be corrected.

2. **Fix Targets** - Interior goal: growth  
Exterior goals: to have an action over external trading trough the Balance of Payments, to increase the ratio of openness:  $100*((X+M)/2)/GDP$  and to go from deficit to external equilibrium.

#### **3. Choose a policy to implement**

The policy to apply would be specifically be applicable at this juncture since it is based over estimations arising out of the present economic conditions. With regard to the targets, it will be applied a reflationary policy inspired from the Keynesian theory.

The choice of the tool(s)

As Longatte J., Vanhove P., (2001) the analysis will be based on the rule of Mundell for making the selection between instruments. Each instrument should be applied to work toward the end for which it has the more efficiency. In the case of a fixed exchange rate, monetary policies are generally applied over the external equilibrium.

- Permissive monetary policy

Mind out: Goals of monetary policy are identified according to Consumer Price Indice (CPI).

The monetary policy aims to reduce the interest rate (action over the creation of money, namely the credit). Since the interest rate is the investment's price, diminishing the interest rate come with a follow up of the investment that stimulate growth. This refers exactly to the accelerator principle and not to the Keynesian multiplier. Sure enough, in this case, the effects of investments over income and then over consumption can be observed. Following this path we could act on the GDP while controlling the budget deficit. Applying this policy will certainly imply an increase of import of capital related to technology and education coming from the real world. Now, to keep following the goal of coming closer to exterior equilibrium, an action over exportation should be adopted. This appears to be easier than expected since the rest of the world is increasing its consumption of goods and services coming from SL. Indeed, SL is starting to become well known and has thus more visitors and its services are being more and more appreciated. We would thus apply the following policy:

- Depreciation of the national currency in order to generate a gain of competitiveness.

It is matter of an increase of the liquidity ratio of the economy to induce a decrease of the interest rate. Since the remuneration of the capital is lessening, foreign assets are thus less attracted (decrease of Foreign Direct Investment). A reduction of the demand of money can thus be observed over the foreign exchange market. In fact, the exchange rate is depreciated. The goals of looking for price competitiveness through national currency depreciation is achieved. The economy will recover for external equilibrium with the following mechanism. A monetary depreciation would imply an increase of the price of import in L\$ and a diminution in volume of import. By the same time, a diminution of exports prices in \$US would be observed accompanied by an increase in volume of export. The external equilibrium will be thus restored. To increase the money supply and depreciate the exchange rate the state could sell L\$ but no more than the amount of reserves. This is the method of exchange control. The cornerstone of those forecasts is the interest rate. The effects of those policies can be observed on the 4 main sectors of this economy.

#### 4. Present the results of the simulation

**Consider each of the 4 major sectors of the economy** This economy is financed at 72,48% by the Gross Domestic Product. In order to ease the launch of e-commerce of real products: deals over real goods coming from the rest of the world, it is necessary to attract internet users on SL by perfecting the quality of services through the increment of investment both public and private. However, since state is almost out of the economy, private investment would increase many more than public investment. Quite so, state has limited control over the structure of this economy. It could not consequently change this structure to intervene quickly and efficiently

Table of the Resources Employments Equilibrium.						
	Value in year T	Index of volume T+1	Value T+1 at the price of year T	Index of price T+1	Value in year T+1	Index of value T+1
Gross Domestic Product	3,952.80		0.00		4,849.28	122.68
Importation	1,500.20	102.00	1,530.20	112.00	1,713.83	114.24
Total Resources	5,453.00		1,530.20		6,563.11	
Consumption	2,700.00		2,754.00	109.00	3,001.86	
Households	1,800.00	102.00	1,836.00	109.00	2,001.24	111.18
Public administration	900.00	102.00	918.00	109.00	1,000.62	111.18
Investment	1,753.00		2,003.90		2,184.25	
Households	453.00	130.00	588.90	109.00	641.90	141.70
Public administration	500.00	115.00	575.00	109.00	626.75	125.35
Financial companies	800.00	105.00	840.00	109.00	915.60	114.45
Exportation	1,000.00	135.00	1,350.00	102.00	1,377.00	137.70
Total Employments	5,453.00		6,107.90		6,563.11	

with investment.

**In the preceding table, let's set:**

An inflation rate of 9%

Prices of goods traded on SL should not increase too much on SL in order to maintain an advantage compared to the reality of shopping on real markets.

An increase of investment's price of 9%.

An increase in the volume of investment in government by 15%

An increase in investment volume of households of 30%

An increase in investment volume of financial companies by 5%

An increase in the import volume of 2%

An increase in export volume by 35%

<b>Public Finances</b>			Year T	Year T+1
<b>Revenues and donations</b>			<b>990.7</b>	<b>1,345.48</b>
	Fiscal revenues		940.5	1200
	Domestic revenues		395.3	600
	Customs revenue		475	350
	Other revenues		70.2	250
	<b>Donations</b>		<b>50.2</b>	<b>145.48</b>
<b>Government expenditures</b>			<b>1400</b>	<b>1627.37</b>
	<b>Current spending</b>		<b>900</b>	<b>1000.62</b>
	wages		630	707
	materials & furnitures		180	200.62
	interest on public debt		90	93
	Domestic debt		27	30
	Foreign debt		63	63
	<b>Capital expenditure</b>		<b>500</b>	<b>626.75</b>
<b>BALANCE ON BUDGET</b>			<b>-409.3</b>	<b>-281.89</b>
<b>Deficit financing</b>			<b>409.3</b>	<b>281.89</b>
	<b>Foreign</b>		<b>15.3</b>	<b>30</b>
	<b>Domestic</b>		<b>394</b>	<b>251.89</b>

On which branches of economic activities will those forecasts count on ?

Branches of economic activities	<b>The different sectors of the economy</b>					
	Value in year T	Index of volume T+1	Value T+1 at the price of year T	Index of price T+1	Value in year T+1	Index of value T+1
1- Agriculture/Forestry	1,395.00	102.00	1,422.90	102.00	1,451.36	104.04
2- Extractive industries	7.40	102.00	7.55	102.00	7.70	104.04
3- Manufacturing	312.50	127.00	396.88	102.00	404.81	129.54
4- Building-trade and public works	38.30	140.60	53.85	113.00	60.85	158.88
5- Electricity and water	22.50	113.00	25.43	102.00	25.93	115.26
6- Trade/Restaurant/Hotels	596.50	145.00	864.93	112.00	968.72	162.40
7- Transport and communication	93.20	112.00	104.38	112.00	116.91	125.44
8- Financial institutions	333.60	107.00	356.95	112.00	399.79	119.84
9- Other trading services	342.10	140.00	478.94	110.00	526.83	154.00
10- Non trading services	811.70	105.00	852.29	104.00	886.38	109.20
<b>Total</b>	<b>3,952.80</b>		<b>4,564.08</b>		<b>4,849.28</b>	

The various branches of economic activity account for goods and services created on SL with the means of the Internet and computer technology. The increase of the GDP will be based

mostly over the rise in volume of the production coming from the following economic activities:

- 4- Building-trade and public works,
- 6- trade, restaurants, hotels,
- 8- other trading services.

### Public Finances

The State rarely interferes, it is the kingdom of: Laissez-faire. The Domestic revenues should be increased in order to select dynamic residents who can stimulate investment to contribute to GDP. Indeed, internal revenue = subscription fees, by increasing this tax, we could select residents who are really eager to have a return on investment for the money spent for the subscription. Decrease of custom taxes in order to warm up trades. Donations are increased to 3% of GDP in the year T +1, depending on fundings from "Diplo Foundation, a research institute whose research purpose focuses on issues related to ICT. Increase in other revenues due to progress in the building sector. Changing the structure of expenditures. Regarding capital expenditures, the state of technology being the best to date, it would be better if the State invest in the field of electronic security to enforce the confidence of residents and multinationals and encourage them to invest. It will be the matter of ensuring quality of services offered by residents, to care about the legality of their activities etc. The wages and materials are increased to encourage officials and other specialists are employed. Capital expenditures increase by 25%, while expenses increase by 11%. Capital expenditures increase more than current spending. As for interest on public debt, its overall variation is negligible, but the payment of interest on the debt inside the country is growing while the payment of interest for external debt does not vary. Capital expenditures increase by 25%, while expenses increase by 11%. Capital expenditures increase more than current spending. For the deficit financing, the interior financing diminish to alleviate the internal pressure over domestic saving and avoid crowding - out "effect.

### Balance of payments

Net private transfers are rising because households are supported by their friends abroad who want to help them invest. The net external loans decline because capital is cheaper on domestic market and there are influx of transfers

Balance of Payments		
	Year T	Year T+1
<b>Goods and services</b>	<b>-500</b>	<b>-336.83</b>
Merchandise trade balance	-600	-450.00
Exportation fob	600	850.00
Importation fob	1200	1,300.00
Services	100	113.17
Travels	75.3	80.00
Interests & dividends	15.3	20.07
Other services	9.4	13.10
<b>Transferts nets</b>	<b>250.7</b>	<b>375.48</b>
Net private transfers	200.5	230
Net public transfers	50.2	145.48
<b>Net current balance</b>	<b>-250</b>	<b>38.65</b>
<b>Net balance on capital account</b>	<b>116.3</b>	<b>106</b>
Foreign Direct Investment	40.5	30.5
Net external loans	60.5	45.5
Other external fundings	15.3	30
<b>Overall balance</b>	<b>-133</b>	<b>144.65</b>
<b>Change in official reserves</b>	<b>133.2</b>	<b>144.65</b>

The deficit in goods and services has considerably improved from -500.2 to -336.83.

The rate of openness has growth from 31.63% to 31.87%. It has weakly increased. The ratio import / GDP rose from: 37.95% to 35.34%. The ratio export / GDP rose from: 25.30% to 28.40%. The coverage ratio Export / import rose from: 66.66% to 80.35%. The overall balance of payments is an indicator of economic health as it shows a surplus of 144.05.

### Monetary sector

Monetary Sector				
	Year T-1	Year T	Year T+1	
1- Net external assets	988.2	855	999.65	
<b>2- Net domestic credit</b>	<b>1005.6</b>	<b>1459.6</b>	<b>2078.49</b>	
Net public credit	790.6	1184.6	1436.49	
Net private loan	215	275	642	
<b>3- Supply of money (M3)</b>	<b>1993.8</b>	<b>2314.6</b>	<b>3078.14</b>	
4- Supply of money (M2)	1694.7	1967.4	2665.11	
Supply of money (M1)	1495.3	1735.9	2360	
Current deposits	199.4	231.5	305.11	
5- Foreign currency deposit	299.1	347.2	413.03	

After transposed the net external assets and net public credit in this table and adjusted the private loans, assumptions and policies are checked because the money supply M3 is rising sharply. The supply of money available is expected to facilitate the circulation of currency and the monetary transactions. The ratio of liquidity goes from 59% to 63%.

### Results

**Exterior goals.** The goal of increasing the ratio of openness has been poorly achieved. But, surprisingly, the goal of reaching external balance has been over exceeded. The overall balance of the balance of payments is exceeding by 144.65.

**Interior goals.** Thanks to the accelerator principle, the increase of the GDP has been accomplished without mining the budget deficit. The budget deficit has been greatly alleviated from -409.3 to -281.89.

### 5. Conclusion

An economic policy can rarely meets its goals without secondary effects compromising the original targets. As an example, economic policies looking for growth are called reflationary policy because they come with growth of the inflation rate. Through this article, a monetary policy based on the diminution of the inflation rate has been applied. The framework of this simulation of economic policy is totally virtual: virtual economy, virtual world, virtual data unless the considerations and assumptions that are based over the actual situation of Second Life. Hypothesis are derived from economic rules, assumptions and consideration previously mentioned. The main targets were : growth, increase of the ratio of openness, exterior equilibrium and the simulation used non econometrical skills of forecast while looking simultaneously at 4 main economic sectors: real, public finances, Balance of Payment, monetary sector. At the end, the 3 main goals have been achieved while bringing surprisingly a positive non expected effect: the alleviation of the public deficit. This paper aims to attract the attention of the scientific community toward the great place that SL could take as an object of scientific matters, experimentations and/or studies.

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