UNDERSTANDING CONTINGENCIES OF SAY'S LAW OF MARKETS

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Abstract

Jean Baptiste Say's controversial proposal of supply fueling demand stands out as an abstract concept among other classical models of economic growth and limits that discussed in detail how everyday behavior of producers and consumers sets an invisible hand into motion. There indeed are many contingencies underlying the so-called Say's law which are often ignored by the controversies. This short paper attempts to understand those contingencies and their relevance to economic policy using system dynamics modeling and computer simulation.

Keywords: economics, economic development, Say's law, system dynamics modeling, computer simulation, classical economics.

How may supply fuel demand?

Influenced by the economic growth model of Adam Smith that tied income to production implicitly assuming that all production can be sold, a French thinker Jean-Baptiste Say tried to explain in early 1800s how factor payments for prior production will increase future aggregate demand, provided of course this prior production is of a good or service that households or investors can use. Hence, the phrase 'supply creates its own demand' is often attributed to Say (1).

The growth process Say described can be represented by a positive feedback system illustrated in Figure 1. For simplification, one-factor economy consisting only of workers is considered.

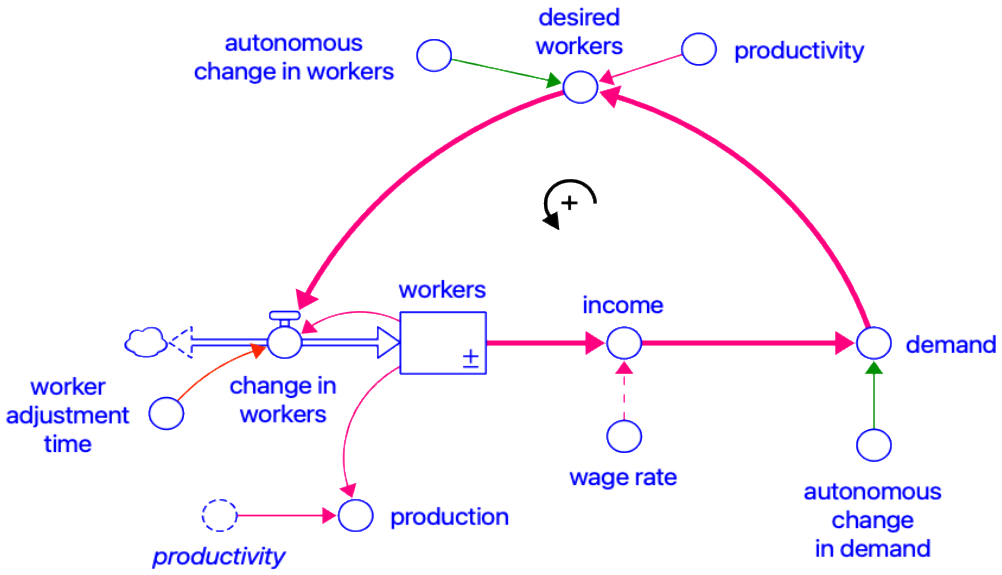

Figure 1 Growth process described by Say's law

Essential equations for this system would be:

workers = ∫(change in workers) * dt
change in workers = (desired workers-workers)/worker adjustment time
desired workers = demand/productivity
demand = income
income = workers*wage rate
production = workers*productivity

The engine of growth in this system is the positive feedback loop in Figure 1 of which both supply and demand are a part. The gain of this loop can be calculated by using the process discussed in (2):

Gain = Io/Ii = wage rate/productivity

When wage rate = productivity, which would be the case when a competitive market comes to a long-term equilibrium with zero economic profit, irrespective of whether there is a one-time autonomous increase in supply resources or demand, the other will follow provided of course the production has created marketable goods and services. The presence of delays in the adjustment process can change the path of adjustment again in both supply and demand related interventions. Higher order delays can even create overshoot. Hence, the debate between demand siders and supply siders on the validity of the law is moot. Both supply and demand factor into the feedback loop representing the growth process and an autonomous increase in either can induce complementary change in the other. There are however many contingencies implicit in the so-called Say's law that have led to much controversy about its validity (3).

Relaxing limiting assumptions of Say's Law

Say's law has often been criticized for its limiting assumptions, like production must always create enough disposable income and the right mix of goods and services so there is always demand for consuming new production (although both low wage rate and production of un-needed goods and services may inhibit demand); the market must remain clear so there is no surplus of supply or demand (although some commodities might always be in excess and others in short supply), resources always remain fully employed (although they may not be) and the economy is closed (a rare case in the modern world). Those criticisms can however be refuted by relaxing the limiting assumptions as explored below:

Adding market dynamics

Figure 2 inserts an inventory between demand and supply and adds the process of price determination and its impact on both demand and supply. Table 1 lists the computational detail of this extended model. Figure 3 compares growth of income resulting from one time increase in the desired supply resources and demand of 5 units each.

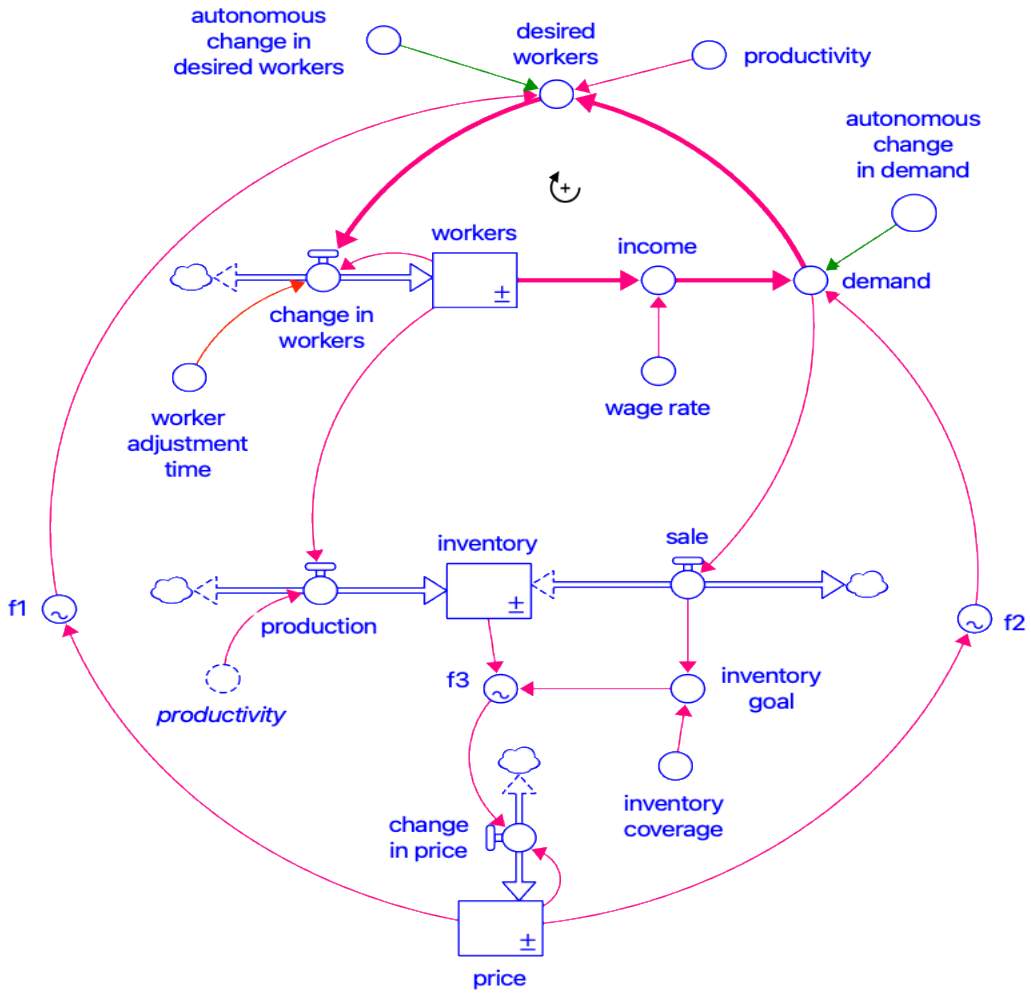

Figure 2 Market dynamics and Say's Law

Table 1 Logic of the growth process with market dynamics

Variable	Equation
inventory(t)	∫ (production - sale) * dt
price(t)	∫ (change in price) * dt
workers(t)	∫ (change in workers) * dt
change in price	price*f3(inventory/inventory goal); f3'<0, f3"">0
Inventory goal	sale * inventory coverage
change in workers	(desired workers-workers)/worker adjustment time
production	workers*productivity
sale	demand
demand	income*f2+autonomous change in demand; f2'<0, f2"">0
desired workers	(demand/productivity)*f1+autonomous change in desired workers; f1'>0, f1"<0
income	workers*wage rate

As shown in Figure 3, price changes and their impact on supply and demand create growth in both cases, albeit with oscillations signifying presence of underemployment of resources when supply is reduced following over-production.

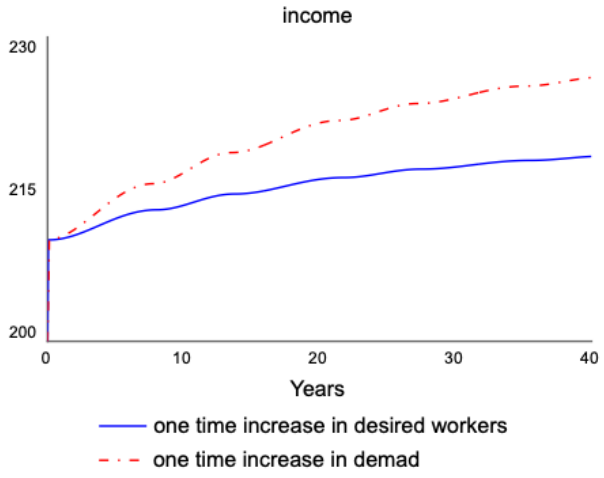

Figure 3 Growth arising from autonomous increases in supply and demand in a system subsuming market dynamics

Note also the impact of demand increase is higher than the supply increase. The autonomous supply increase would at first raise inventory that would suppress price and production in the subsequent rounds, while the autonomous increase in demand would at first deplete inventory that would raise price - increasing production in the subsequent rounds. The multiplier effects of autonomous increases in supply and demand therefore differ, although both cause growth.

b) Relaxing closed economy assumption

Closed economy assumption can be relaxed by an autonomous change in desired workers needed for production for net exports which instigates growth. Likewise, net imports will reduce the need for desired workers, causing decline. Simulations for these changes are shown in Figure 4.

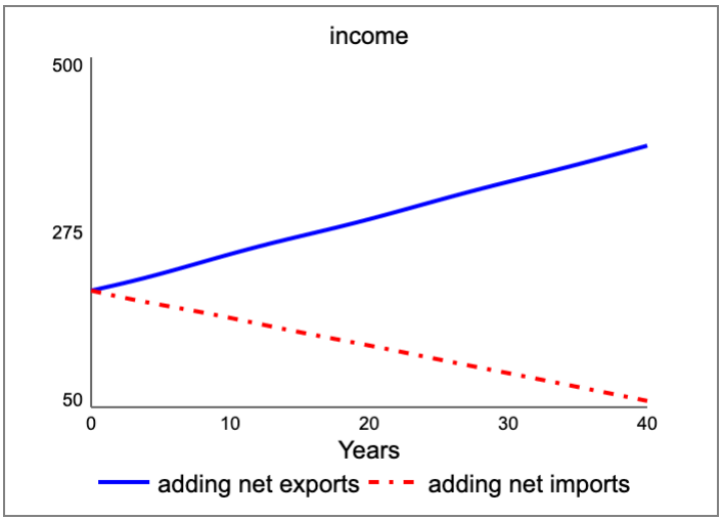

Figure 4 Effect of adding changes in desired workers caused by net exports or imports to the model the model of Figure.

c) Accounting for government expenditure

Accounting for government expenditure is analogous to adding an autonomous demand stream. In Keynesian interpretation, this can cause growth but when the implicit assumption that the composition of government demand is similar to that of the rest of the economy, which is often a tall order. A government hiring soldiers to engage in ceremonial marching or more bureaucrats to shuffle files may not create marketable services. A government may also produce or buy weapons thus diverting production capacity to their manufacture and limiting production of goods and services that the labor in weapons production would want to buy. The gain of the growth process when the composition of government induced demand is similar to that of the rest of the economy will take the form:

Gain = (wage rate/productivity)*(1 + government spending/income)

This gain will progressively reduce growth in additional income in the subsequent rounds after an autonomous increase is applied either in demand or production resources. This system will come to an equilibrium when its gain converges to 1. Note, productivity > wage rate for the gain to converge to 1 to accommodate autonomous government-related demand. To be precise, as

income rises with an autonomous increase in either demand or production resources, the ratio government spending/income will decline over successive rounds until

government spending/income = (productivity/wage rate - 1)

d) Altering income distribution parameters

There however exists a critical contingency that greatly impacts the validity of Say's law – the parity between wage rate and the productivity of workers. Note that the gain that drives the growth process in both the basic and extended models of Say's law depends on the ratio wage rate/productivity. When government spending = 0, we assumed wage rate to be equal to productivity, which implies an absolutely fair functional income distribution (between owners of capital and suppliers of labor - each receiving income share equal to the marginal productivity of the production factor they contribute). Thus, when government spending is a fixed fraction of income (say government spending/income = g), wage rate must = productivity/(1+g) to create fair functional income distribution.

In reality, while worker productivity depends on technology, wages depend on the economic bargaining position of the workers that depends on labor market conditions as well as on opportunity cost of wage work (4). Invariably, those conditions have allowed suppression of wages and appropriation of surplus by owners of capital, which has led to widespread income and wealth inequalities that continue to worsen. Indeed, as shown in Figure 5 , the parameters of the gain of the positive feedback underlying the growth process are critical to its efficacy irrespective of whether it is initiated by an autonomous growth in supply or demand.

A small increase in worker compensation goes a long way to increasing growth by augmenting the gain of the growth process, while a similar decrease in wage rate may set in a powerful decline. No wonder, growth, weather induced by supply side or demand side instruments, has been difficult to sustain in low-income countries with low wage rates. Note however, the wage rate will vary depending on labor market and a fixed difference between wage rate and productivity and the ensuing income trends are only hypothetical.

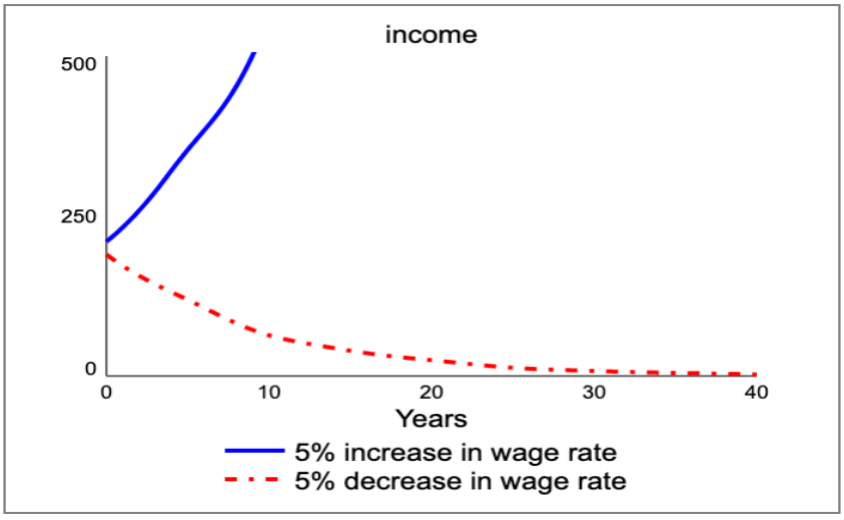

Figure 5 Sensitivity of growth rate to wage rate.

Discussion

All above experiments assume unlimited labor supply in our one-factor model. In a two-factor system consisting of workers and capital infrastructure, it would also mean unlimited capital investment capability. When labor supply is fixed, additional hiring whether supply driven or demand driven will create wage escalation, which might initially further increase disposable income, but will eventually curtail expansion leading to a downturn. Likewise, saving constraint and the ensuing high interest rates would limit supply of investment capital.

The classical models of economic growth subscribe to Say's law in varying degrees. It is clearly embedded in Adam Smith's concept of growth that ties demand to total income rather than considering its functional distribution. While Ricardo and Malthus allude to the creation of subsistence wage through labor market conditions, but they do not adequately tie it to demand for goods and services. Marx however clearly repudiates Say's law by surmising how low wages and unemployment might create idle capital segueing into the downfall of capitalism. On the other hand, while Schumpeter saw the process of creative destruction replacing old capital with new technologies, he was not concerned by income distribution impacting demand. All implicitly assume that the production mix complements demand.

In this author's view, the value of Say's law to economic development policy lies in understanding its contingencies (5). Supply side interventions in the face of low wages and widespread poverty may not stimulate the economy. Indiscriminate hiring by governments for income support may only reduce the production capacity by excluding so hired personnel from productive workforce. Defensive expenditures might likewise curtail production capacity while expanding demand, both creating inflation. The variety of institutions existing in the economy and how production capacity is divided between them is discussed at length in (6) and not pursued here.

Conclusion

Say's Law clearly states that to have the means to buy, a buyer must first have sold something of value. Thus, a buyer's ability to buy is based on the buyer's successful past production for the marketplace. So, the source of demand is prior to the production and sale of goods for money (seen only as medium of exchange), not money itself. In other words, a person's ability to demand goods or services from others is predicated on the income produced by that person's own past acts of production. Hence, the law may not give *carte blanche* to supply side interventions nor refute demand side policy but should caution against their indiscriminate use.

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