Economic recessions and recoveries

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Abstract

Economic output may drop for reasons related with supply, such as a fall in the number of the employed factors of production or increases in real costs; and for reasons related with demand, such as an increase in non-productive market power or a fall in aggregate demand, the worst type of recession in the past. Falls in aggregate demand happen when there are economic disruptions such as a savings-investment deficit or a trade-foreign investment deficit and they can be persistent when households, companies and banks’ solvency and liquidity ratios deteriorate. Due to economic rigidities, like the nominal value of paper money, the system needs to avoid a fall in monetary inflows to aggregate supply. Price stability policies cannot guarantee this aim when inflation rises. In contrast, full inflation-indexed economies can avoid or mitigate falls in aggregate demand and they can help governments to overcome recessions and to achieve a sustained growth.

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1. Introduction

The recent economic recessions in developed economies have heightened the interest of economists in understanding them (Reinhart and Rogoff, 2009). Macroeconomists have usually studied economic recessions as stages of business cycles or fluctuations, and they have identified many causes of short-term decreases in economic output, such as oil crises or a fall in consumer confidence. Moreover, they have devoted significant efforts to studying financial crises, the most serious types of recession. Current experience shows that we still do not know how they happen and, more importantly, how to overcome them and avoid them in the future.

Before the Great Depression, Schumpeter (1934) stressed the role of entrepreneurs and their creative destruction when seeking to explain economic growth and business cycles. The experience of the Great Depression with its high unemployment levels challenged the classical view that markets clear. Economists focused on psychological, monetary and financial issues. Kindleberger (2000) proposed that economic cycles are driven by euphoria and panic. Minsky (1993) added failures in the lending system, with the acceptance of speculative or Ponzi borrowers. Austrian economists pointed to malinvestments due to excessive credit expansion. Fisher (1933) stressed the dangerous mechanisms of financial crises in his debt-deflation theory. Monetarists, like Friedman and Schwarz, emphasised monetary matters in seeking to understand crises. Keynes (1936) pointed to fluctuations in investment, changes in the marginal efficiency of investment, and aggregate demand. There was also a debate about the role of governments. While Keynes defended an increase in public spending and easy monetary policies, Austrian economists criticised the role of central banks in inciting and solving crises with monetary policy.

During the 1970s, the approach began to change. Lucas (1976) criticised the lack of microeconomic foundations of macroeconomics. Kydland and Prescott (1982) focused on non-monetary matters assuming market efficiency and the significance of technology shocks. The main controversy was about the role of monetary matters in economic fluctuations. New Keynesian models adopted some of the
principles of the Real Business Cycle, but defended the significance of monetary issues in the short run (Clarida et al, 1999). The study of financial crises fostered a focus on the role of borrowers and lenders' balance sheets, credit channels, and the financial accelerator (Bernanke et al, 1996; Kiyotaki and Moore, 1997).

This paper focuses on the causes of economic recessions and recoveries, and offers some clues about the causes of business fluctuations. It also proposes measures to overcome recessions and achieve a sustained growth, following a simplified model of the economy based on flows.

2. The Model

In order to analyse the causes of economic recessions and recoveries, the paper proposes a simplified model that focuses on the main economic components and their relationships.

2.1 Model Components

The following are the main components of the model:

*Agents*

*Agents* include households or families, companies or entrepreneurs and governments. They take the main decisions about consumption, savings, investment and the use of factors of production. They also provide the factors of production (labour, capital and land).

*Demand*

*Demand* shows the Agents' consumption and investment preferences for both domestic and foreign goods and services.
**Production / Supply**

*Production* or *Supply* shows the goods and services produced by the domestic factors of production.

**Foreign agents (production)**

*Foreign agents* produce and demand goods and services and relate with the domestic system through imports and exports.

**The Banking system**

*The Banking system* includes central banks and banks or financial institutions that collect savings and lend loans.

**Real Asset Markets**

*Real Asset Markets* show the exchanges in real asset markets such as land, houses, equipment or art.

**Financial Markets**

*Financial Markets* show the exchanges in financial markets of assets such as stocks or corporate or public bonds.

**Foreign Agents (financial)**

*Foreign Agents* buy and sell assets in Financial and Real Asset Markets. They also lend to domestic banks and borrow from them. Although *Foreign Agents* are divided (financial and production), we can consider them as the same component.
2.2 Subsystems of the model

We classify the model into three main subsystems or sets of components.

2.2.1 The productive and financial subsystems

Figure 2. The productive and financial subsystems
We draw a distinction between the productive and financial subsystems (see Figure 2). In the productive system, *Agents* decide which factors of production will produce the desired goods and services. These goods can be goods for present consumption or goods (assets) for intertemporal use. *Foreign Agents* also produce and demand goods and services that compete with those produced by *Agents*. In the financial system, *Agents* establish their preferences with respect to the rights to own intertemporal assets such as real assets, bank deposits or financial assets. These real intertemporal assets offer an intertemporal utility, such as the benefit of enjoying a house or the “work” of a productive machine, while the financial assets offer the capacity to buy those assets or consume goods and services that will be produced in the future.

### 2.2.2 Domestic (internal) / Foreign (external) components

*Agents, Supply, Demand, the Banking System, Real Asset Markets and Financial Markets* are the internal or domestic components of the system, while *Foreign Agents* are the external or foreign part of the system.

Figure 3. The “Domestic” and “Foreign” subsystems
2.2.3 Decision makers / Wish components

Agents, Foreign Agents (both productive and financial) and the agents of the Banking System are decision makers, because people inside these components make decisions about production, consumption, investments... Production, Demand, Real Assets and Financial Markets are “Wish components” and show the preferences and exchange prices of goods, services, factors of production or assets.

Figure 4. The “Wishes / preferences” and “Decision makers” components

![Diagram showing relationships between decision makers and wish components]

2.3 Relationships

Components have economic relationships as shown in figure 5.
Four main types of relationship can be found:

a) exchange of money
b) exchange of goods and services, such as consumption or investment goods
c) exchange of factors of production, such as labour, capital and land
d) exchange of rights. Rights refer to the right to own real or financial assets, such as land, houses, stocks, bonds, money, etc., or the right to collect taxes.

2.3.1 Relationships in the productive system

In the productive system, the relationships are always an exchange of money for goods, services or factors of production. Money always flows in one direction, and goods, services and factors of production flow in the opposite direction (see Figure 5). Agents exchange the factors of production with Supply for money. This money allows Agents to demand goods and services produced by Supply or Foreign Agents. Similarly, Foreign Agents demand goods and services from Supply.
(exports) and produce goods and services to meet the Agents’ demand (imports) and exchange these for money. Figure 6 shows the main monetary flows in the productive system.

Figure 6. Main monetary flows.

D is the monetary flow between Agents and Demand. It shows the domestic demand in domestic and foreign goods and services. The main elements are imports and private and public consumption (C) and investment (I).

E is the amount of money that flows from Demand to Supply, so it is the domestic demand in domestic goods and services. The main elements are private and public consumption and investment.

F shows the monetary flow between Supply and Agents due to the payment of factors of production. The main elements are wages, profits, returns of capital and land…

M represents imports and is the flow between Demand and Foreign Agents.

X represents exports, which is the flow between Foreign Agents and Supply.
2.3.2 Relationships in the financial system

In the financial system, decision makers exchange money for rights. Money and rights can flow in all directions, as Agents try to find the best asset or right according to their preferences. Agents and Foreign Agents can decide to buy or sell real or financial assets and save money for future consumption or recover savings for current spending. They can also borrow from Banks to invest or buy assets and must return previous loans. The Banking System has the capacity to increase or decrease the amount of money that flows through the system. The main monetary flows in the financial system (see Figure 6) are as follows:

S is the flow from Agents to the Banking System and represents the amount of savings. It covers the Agents’ savings, return of loans and interest paid on loans.

B is the amount of money flowing from the Banking System to Agents. It includes Agents’ saving recoveries, interest paid on savings and new Agents’ borrowings.

G is the net amount of Agents’ investment in Real or Financial Assets. G is negative when Agents increase their assets and positive when they reduce them. Gf is the investment in financial assets and Gr is the investment in real assets.

H is the net amount of Foreign Agents’ investment in Real or Financial Assets. H is positive when Foreign Agents buy more assets than domestic Agents buy in foreign markets. Hf is the investment in financial assets and Hr is the investment in real assets.

J is the net amount of borrowing or lending between the Banking System and Foreign Agents. J is positive when Foreign Agents lend money to the Banking System and negative when they borrow from it.

O is the net amount of the Banking System or savers’ investments in Real or Financial Assets. O is positive when Banks buy assets and negative when they sell them. Of is the investment in financial assets and Or is the investment in real assets.
2.3.3 Relationships inside components

Some components have many subcomponents that are interrelated. The main relationships for the present purpose of the paper are in the Agents component, where Governments tax Families and Companies and transfer rents, giving them aid or grants. In the Banking System component, the Central Bank modifies the system’s liquidity and imposes conditions on Banks. The main flows are (see Figure 6):

T is the taxes or flows that Governments collect from Families and Companies.

U is the transfers of money from Governments to Families and Companies.

V is the dividends or money that Companies pay to Families and Governments, as owners of companies.

N is the flow between Central Banks and Banks, facilitating or restraining liquidity to the system.

2.4 Main processes

Components are related according to the relationships shown in Figures 5 and 6. The main processes are as follows:

2.4.1 Domestic production and demand

In the domestic production and demand process (see Figure 7), Agents must decide, on the one hand, about the use and organisation of the factors of production, and on the other hand, about which part of their income to consume and which part to save and invest. In order to maintain a balance in the system’s monetary inflows and outflows in an economy without changes (no productivity gains, new products…) and without Foreign Agents, the Banking System must
return to Agents the same amount of money they obtain from them in the form of new loans or saving recoveries (B = S). Agents’ income becomes savings and consumption (F = S + C). Agents’ demand is consumption and investment (D = C + I). Agents principally use the money from Banks for their investments, and therefore investments match with savings, balancing the system (F = D if S = B). We refer to the relationship between the amount of savings of Agents and the amount of lending they obtain from Banks to demand new goods and services as the savings-investment balance.

Figure 7. The domestic supply and demand process

2.4.2 Trade and foreign investment

Another essential process is the relationship between the domestic subsystem and the foreign subsystem (see Figure 8). Foreign Agents buy goods and services from Supply (exports for the domestic subsystem) or sell goods and services to Agents’ Demand (imports). In order to maintain economic output, the balance of trade (X - M) should be in balance with the balance of capital (J + H). Therefore, if imports are higher than exports (trade deficit), the economy will need a capital
surplus to be in balance and investments of foreigners will be higher than Agents’ investments in foreign economies \((X - M = -(J + H))\). We call this relationship the trade-foreign investment balance.

Let us suppose there is a country called A where Agents import more than they export, creating a trade deficit. Foreign Agents are paid in the currency of A, which implies the right to buy goods and services produced in A. Foreign Agents may prefer to buy these now, increasing A’s exports and balancing its balance of trade, or to buy them in the future, whereupon they save or buy assets from the domestic system. In this case, A has a surplus in the balance of capital. In the long run, it seems reasonable that the accumulative trade balance will be balanced. Otherwise, Foreign Agents will accumulate rights to buy A’s goods and services, but will never buy them, while Agents of A will continuously obtain goods and services from Foreign Agents.

Figure 8. Trade and foreign investment
2.4.3 Changes in supply / demand

The economic system is not static. Technology developments and competition among companies, entrepreneurs and *Foreign Agents* change the structure of the productive capacity, the supply of goods and services, and the preferences of *Agents* and *Foreign Agents*. Prices, wages, interest rates, costs, utilities and exchange rates help decision makers to choose according to their preferences about consumption, investment, saving or lending. They decide on the amount and type of factors of production to use, the goods and services to produce, and the assets to buy or sell. These decisions modify the flows that circulate in the system and shape prices, costs, preferences… For example:

- Interest rates will fall if, ceteris paribus, \( S_{t+1} + J_{t+1} > S_t + J_t \).
- Prices will rise if \( \Delta E + \Delta X > \Delta Q \), where \( Q \) is the production of goods and services.

2.5 Equilibrium

The system always tends towards an equilibrium that is constantly changing due to new products, technologies, changes in preferences… Prices of goods and services, interest rates and costs of factors of production give *Agents* the necessary information to make the decisions to allocate the resources so that the new equilibrium is reached. For example, if wages rise, then prices will tend to rise, companies will tend to decrease their demand for labour… and the economy will tend towards a new equilibrium. The system not only seeks a short-term equilibrium, but also a long-term equilibrium. For example, balances of trade and capital can be positive or negative in the short run, but in the long run the accumulated balances should be equilibrated, unless countries accept that foreigners become owners of all domestic assets and foreigners agree to produce for domestic *Agents* indefinitely.
If all variables were flexible, output would not fall due to declines in inflows to \textit{Supply}, but since there are some rigidities, output falls. For example, if inflows to \textit{Supply} declined, prices should fall. If wages, debts and savings fell in the same proportion, output would not fall, and workers and savers would maintain their real purchasing power. But savers may prefer to hold cash and maintain the nominal value of money before they see how the nominal value of their savings declines. Consequently, nominal debts do not fall, workers oppose declining wages, companies refuse to reduce prices and output falls. This situation can create an undesired and unstable disequilibrium that reduces output even further. In order to avoid this process, inflows to aggregate \textit{Supply} must not decrease.

In \textit{Wish components}, outflows and inflows are always in balance, because they show the results of exchanges or preferences, but in \textit{Decision makers’ components} inflows can differ from outflows. When inflows are higher than outflows, \textit{Decision makers} cause systemic disruptions and undesired disequilibria. Disruptions may occur in the domestic subsystem, causing:

a) A savings-investment deficit

- \textit{Agents} may decide neither to save nor consume (keeping their money at home, for example) and consequently inflows will be higher than outflows (\(D < F + B + G – S\)). In the long run, they should tend to spend or save all their money, but in the short run they can cause a disruption of the system.
- \textit{Agents} may want to save but not to borrow (\(S > B\)), causing, ceteris paribus, a fall in monetary inflows into the whole system.
- \textit{Banks} may decide not to lend or reduce lending to \textit{Agents} (\(S > B\)) if \textit{Banks} or \textit{Agents} have solvency or liquidity problems.
- \textit{Banks} may not be able to lend and keep \(B = S\) if \textit{Central Banks} increase interest rates and restrain liquidity (\(N < 0\)).

or may occur in the relationship with the foreign subsystem, causing
b) a trade-foreign investment deficit:

- *Agents* and/or *Foreign Agents* may sell domestic assets, withdraw funds or hold the currency of the domestic economy outside the system without increasing the balance of trade surplus ($|M| > X + H + J$).
- *Agents* increase imports, ceteris paribus, while *Foreign Agents* do not increase exports or investments in the domestic subsystem.
- *Agents* decline exports, ceteris paribus, while *Foreign Agents* do not increase investments in the domestic subsystem.

3. Economic recessions

In this model, an economic recession is a fall in economic output (production of goods and services), which may occur for reasons related with supply or demand.

3.1 Causes of a decline in supply

Causes of a decline in supply refer to causes within the *Production* component of the system which are related with the output capacity of factors of production.

3.1.1 Decline in factors of production

Production can fall, ceteris paribus, if the number of factors of production, such as labour, capital or land, decline due to migration movements, declining population, wars, natural disasters, exhaustion of a mine or an oil well, etc.

3.1.2 Increase in real costs

Output can also fall if, ceteris paribus, real marginal costs of production rise. Since the costs of production rise, companies will reduce the use of factors of production
to minimise losses, and consequently output will fall. Increases in costs may be the result of:

a) A decline in productivity due to a loss of skills, the scarcity of raw materials or poorer organisation.
b) An increase in the cost of factors of production, such as an increase in real marginal wages.

3.2 Causes of a decline in demand

Causes of a decline in demand refer to causes within Demand and/or Foreign Agents’ (production) components which are related to the Agents or Foreign Agents’ preferences about the demand for goods and services.

3.2.1 Decline in aggregate demand

Economic production can fall for reasons related with demand when real cash inflow to Production declines \((E_t + X_t < E_{t-1} + X_{t-1})\). If demand falls, ceteris paribus, Companies need to pay more for the factors of production than what they obtain from selling goods and services, causing them losses and forcing them to reduce output if they cannot reduce costs. Declines in aggregate demand occur due to disruptions in the system:

a) A savings-investment deficit. Agents reduce demand because their capacity or wish to demand domestic goods and services fall. Although this decline may occur due to changes in preferences, such as a fall in consumer confidence or the propensity to consume, the main cause is the fall in Agents’ or Banks’ solvency and liquidity.

Many situations can lead to a savings-investment deficit. Agents will demand credit if they believe that the net asset value (NAV) of an asset is
higher than its price or the expected return of an asset is higher than the real interest rate. Banks will lend to Agents if:

- Agents have enough solvency, the value of their assets is higher than debts, and they have enough liquidity or capacity to meet loan payments.
- Banks have enough solvency and liquidity.

Consequently, any situation that reduces the assets’ expected returns to below interest rates or in which the solvency and liquidity of Agents or Banks deteriorates can cause a savings-investment deficit.

Agents and Banks do not know the real return of an asset, but this return needs to be higher than the loan’s real interest rate to obtain a profit, so the asset’s return must be higher than the natural and real interest rates. Agents may be more reluctant to borrow and Banks more reluctant to lend if, ceteris paribus, their expectations decline, or if, ceteris paribus, interest rates rise. For example, if the economy is growing and there is full employment, Agents and Banks may have higher expectations of success than in an economy where economic output is declining, unemployment is rising and risk premiums are high. However, expected returns and market real interest rates should tend to match in a free market that works properly.

Agents need good solvency and liquidity ratios to obtain a loan. These ratios may deteriorate for a number of reasons, such as Workers becoming unemployed, Companies making a loss, negative market evolution (stock crashes or housing crises)... or losses in investments and inadequate payment conditions. Losses in investments and liquidity stress are mainly due to:

- Increases in real interest rates. If real interest rates rise, loan payments will increase for borrowers with adjustable rate loans, reducing liquidity, and the value of assets will decline, reducing the owners’ solvency.
- Increases in natural interest rates. If natural interest rates rise, due to an increase in productivity for example, future prices may tend to fall more than expected and borrowers may have fewer cash flows and greater losses than expected.

- Increases in inflation in non inflation-indexed economies. If inflation rises, non-inflation-indexed assets will lose their value. Due to the tilt effect (Lessard and Modigliani, 1975), increases in loan payments will be higher than increases in income, so borrowers will have liquidity problems. Due to lending restrictions like the front or back-end ratios, new borrowers will receive smaller loans and the prices of assets will decline.

**Banks** also need good solvency and liquidity ratios to grant loans. These ratios may deteriorate if the value of their assets or investments, such as bonds or stocks, decline, or Agents' defaults and losses are higher than expected. **Banks** will have higher losses and reduce their solvency, finding it difficult to obtain liquidity and reducing or refusing loans to **Agents**.

b) A trade-foreign investment deficit. **Agents** and/or **Foreign Agents** avoid the goods and services produced by Production and/or the assets of the system \((X - M < - (H + J))\).

A trade-foreign investment deficit occurs when investors lose confidence in the economy, usually due to a lack of solvency and liquidity on the part of its main economic actors like Governments or Banks. If economies have chronic trade deficits, high debt levels and, especially, high debt levels in foreign currencies, investors will lose confidence in the economy, and the probability of a flight of capital or a trade-foreign investment deficit will increase.
3.2.2 Increase in companies' non-productive market power

Output can fall if companies increase their market power without increasing productivity or improving the quality of their goods and services. Increases in companies’ non-productive market power may be due to a number of reasons, such as:

a) Agreements between companies to reduce competition, such as mergers and acquisitions, or monopolistic or oligopolistic behaviour, such as price or quota agreements.

b) Supply constraints that do not allow demand to be met, such as a fall in supply that leaves present companies with insufficient capacity to meet demand, or an increase in demand with insufficient capacity to increase supply.

c) A lack of substitute goods and services that allow companies to reduce output and increase prices until they reach the level of a substitute product.

3.3 Common economic recessions

Economic systems are dynamic. Although the processes of declining supply and demand are necessary to initiate an economic recession, the balancing trends of the economy and increases in productivity usually avoid it. The processes that are sudden, have a strong influence or are able to initiate other declining processes are those that usually end up causing a recession. Many situations that cause a decline in aggregate demand are present in most economic recessions.

a) Inflation – Housing market crisis

The main cause of economic recessions in developed economies over the last few decades has been the combination of a housing and a banking crisis, preceded by increases in inflation and interest rates. The fact that most economies currently use non-indexed contracts is one of the main sources of system disruptions, because inflation forces Agents to change flows, leading to a fall in the price of assets. Inflation may rise for different
reasons like monetary tensions or the scarcity of resources. When inflation rises:

- Borrowers, mainly those with adjustable rate and long-term loans, such as adjustable rate mortgages (ARM), must increase loan payments ($\Delta S$) above the increase in income due to the tilt effect, and they are forced towards a non-desired increase in saving. On the one hand, they can have problems to return loans, increasing the rate of defaults, and on the other hand, they reduce demand ($\nabla D \rightarrow \nabla E$) and may change their demand preferences, causing losses in the case of some companies and a sudden increase in demand in the case of others, increasing their non-productive market power.

- Due to loan restrictions like the front or back-end ratio, Banks reduce their loans to Households ($\nabla B$) that want to buy a new house, causing a savings-investment deficit in the housing sector and a fall in housing prices and activity. A similar process occurs in the durable goods sector, although this process is less intense, because loan maturities are lower and the tilt effect has a lower influence.

- Unemployment and companies’ losses in the housing (and durable goods) sector rise.

- Since there is an increase in savings ($\Delta S$) and a fall in lending ($\nabla B$) in the housing sector, real interest rates for other economic sectors should fall and investment should increase, but Banks experience losses due to the increase in defaults and the fall in house prices

- and non-indexed long-term bonds lose value due to the increase in inflation, so Agents and Banks experience losses and lose solvency.
- Consequently, risk premiums rise and *Banks* reduce lending due to the solvency and liquidity problems of *Banks* and *Agents*, extending the savings-investment deficit and spreading the recession to other economic sectors.

- Moreover, in order to control inflation, *Central Banks* may increase real interest rates and restrain liquidity to *Banks* ($\nabla N \rightarrow \nabla B$), reinforcing the economic recession.

Usually, the economic recession and the decline in lending lead to a fall in inflation and interest rates, which facilitates economic recovery if *Banks* and *Agents’* solvency and liquidity are not seriously undermined. *Governments* may increase spending or accept higher public deficits that help to maintain the *Banks* and *Agents’* solvency and liquidity, reduce the fall in output and facilitate economic recovery.

b) Bad investments or bubbles

Companies and entrepreneurs’ bad investments or market bubbles have been identified as a source of economic recessions. They can only cause them if they create a savings-investment deficit.

Investment returns must be higher than natural and real interest rates to be profitable. If natural interest rates are higher, investments can become unprofitable because market productivity will be higher than investment productivity, causing investors losses. If investors’ returns are lower than real interest rates, then they will also have losses. Natural and real interest rates can fluctuate due to many causes. For example, increases in productivity, ceteris paribus, raise natural interest rates. As the economy approaches full employment and resource utilisation, natural interest rates can fall, ceteris paribus, because limited resources can contain future productivity gains. Increases in trade deficits tend to lower real interest rates, or *Central Banks* may want to increase real interest rates to avoid increases in inflation.
Problems arise if there are too many investors with investments below real or natural interest rates. This is more likely to happen when interest rates rise or Agents have produced unnecessary goods and services. For example, when the economy is approaching full employment, natural interest rates tend to fall, because limited resources constrain future productivity gains. Real interest rates should follow, increasing assets' value, which can be seen as a market bubble. Inflation tensions may also arise simultaneously due to full employment of limited resources. If real interest rates or nominal interest rates in non-inflation-indexed economies rise, assets will depreciate, Agents will lose solvency and credit demand will fall. At the same time, loan payments for variable rate loans will increase and Agents may start having liquidity problems, increasing the Banks' losses. Similarly, if Agents produce unwanted goods and services, they will experience losses, their solvency and liquidity ratios will deteriorate, and Banks may suffer losses. However, economic recessions will only occur when deteriorations in Agents and Banks' solvency and liquidity cause a savings-investment deficit, Banks reduce lending and Agents experience difficulties in obtaining new loans. If Banks accept to lend to new entrepreneurs there will not be any recession.

c) Insufficient monetary growth

Insufficient monetary growth, which occurred on occasions, mainly during the gold standard era, can cause economic recessions if a savings-investment deficit is originated.

When monetary flows do not grow in line with economic growth, some sectors suffer a fall in aggregate demand. Due to rigidities in debt, wages and prices, Companies have to reduce output and suffer unnecessary losses while unemployment rises. Aggregate economic output does not necessarily fall, but Companies’ losses and unemployed Workers can produce Bank losses. Consequently the deterioration of solvency and liquidity of some Banks, Companies and Workers can lead to a savings-investment deficit and an economic recession.
d) Financial market crash
A financial market crash can also cause an economic recession if it undermines the solvency and liquidity of Agents and/or Banks, creating a savings-investment deficit, as occurred during the Great Depression.

Stock crashes reduce the solvency of Agents and Investment Banks, especially if they bought stocks with credit, so credit to Agents may be reduced. If Banks and Agents lose money and solvency, they may end up having liquidity problems and may be forced to sell more assets to obtain liquidity, depressing the market and exacerbating their solvency problems in what Fisher (1933) called a debt-deflation. The effects of financial market crashes are smaller in those economies in which a differentiation is made between investment banks and commercial banks, and these crashes do not have a negative influence on lending to Agents. Economies need to repair the Banks and Agents’ solvency and liquidity.

e) Oil shocks
A supply crisis due to an oil shock has often been cited as a source of economic recession. According to the model, if an oil shock causes a trade deficit for oil importers, then it should be balanced by an increase in foreign investments, a fall in real interest rates and an increase in domestic investments. If there is no increase in trade deficit because oil exporters increase imports, then there is a change in demand preferences. In both cases, there can be a sudden change in demand that may cause an increase in companies’ non-productive market power and an increase in the real costs of production, which may in turn lead to a fall in real domestic income (and production, if real wages do not fall). However, the main problems with oil shocks are due to the fact that they increase inflation, creating problems in non-indexed economies (see 3.3a).

f) Natural disaster / War
Economies that have the misfortune to suffer a natural disaster, such as an earthquake, or a war, tend to reduce economic output if infrastructures and equipment are destroyed. The length and depth of these kinds of
recessions depend on the Agents’ capacity to rebuild infrastructures. The rebuilding process helps to enhance economic growth and well-organised economies tend to recover the previous output level.

g) Flights of capital
Flights of capital have also been a source of economic recessions, since they entail a trade-foreign investment deficit and an increase in interest rates that leads to a fall in investment. Currency shows a tendency towards devaluation. On the one hand, exports tend to rise. On the other hand, an increase in inflation may cause problems in non-indexed economies (3.3a). Moreover, these sudden changes can involve an increase in the non-productive market power of companies, pushing down the economic output.

Flights of capital have been especially damaging in those economies with high levels of debt (private and public) in foreign currencies, because devaluations increase the indebtedness of Agents and Banks, undermining their solvency and possibly causing a savings-investment deficit.

A trade surplus, long-term funding, sometimes from international institutions, and capital controls help to restore economic growth. Economies with a high level of debt in foreign currencies need a trade surplus or at least a balanced balance of trade and appropriate debt maturities.

3.4 Economic depressions

Some economic recessions, such as the Great Depression in 1929, the Japanese crisis during the 1990s, or the great recession in 2007, developed into depressions or long-lasting recessions. Although they began with a crash in the stock or the housing market, the main problem was the disruption of the system due to a savings-investment deficit and a declining monetary inflow to Supply. As Agents and Banks lost solvency and liquidity, lending was restrained; the monetary inflows to Supply declined even further and exacerbated the damage to Agents and
Banks’ solvency and liquidity. As demand fell, supply seemed to turn into oversupply, so the stabilisation of the savings-investment balance was not enough to restore economic growth, because the apparent oversupply was continuously undermining the Agents’ solvency. What was needed was a recovery of the Agents and Banks’ solvency and liquidity, involving a level of production sufficient to meet debt commitments. This recovery requires a public economic stimulus or a long deleveraging process that restores the system’s equilibrium.

In these situations, Central Banks’ increases in liquidity, lowering interest rates, are not enough to reverse the situation, because Banks and Agents’ solvency and liquidity ratios are too weak. Consequently, Banks are reluctant to lend and Agents are reluctant to borrow (ΔN → ∇B → ∇D → ∇E), regardless of the liquidity of the system or how low interest rates are. Moreover, these policies can generate instability in non-inflation-indexed economies if inflation rises. Governments sometimes try to reverse the situation by increasing spending and issuing new debt but in doing so they raise interest rates for private Agents (the crowding out effect) and burden future generations. So, when Governments try to balance their budgets, they increase the risk of returning to an economic recession or making it worse.

4. Economic recoveries and sustained growth

In order to overcome economic recessions, Governments need to analyse their causes and stimulate economic growth. Governments should try to follow a policy of sustained growth in order to avoid or mitigate future economic recessions and reduce the output gap.
4.1 Economic recoveries from recessions caused by factors related with supply

Economic recessions caused by factors related with supply occur as a result of a fall in factors of production or an increase in real costs. Recoveries may occur thanks to:

a) *Agents* restoring factors of production in the event of destruction of capital due to natural disasters or wars. *Governments* can help private *Agents* if necessary and rebuild public infrastructures. In the event of a fall in population or the labour force, governments need to follow policies that stop the decrease. *Governments* should also protect land and seas from deterioration and promote sustainable activities.

b) Solving the increase in the real marginal costs of production by lowering real costs, such as labour costs or interest rates, or increasing productivity. Education, improving the knowledge and skills of workers, and the innovation of entrepreneurs and intrapreneurs help to increase productivity and reduce costs.

4.2 Economic recoveries from recessions caused by factors related with demand

According to the model, recessions caused by factors related with demand may occur as a result of declines in aggregate demand or increases in companies’ non-productive market power.
4.2.1 Restore aggregate demand

Declines in aggregate demand for domestic supply \((E_t + X_t > E_{t+1} + X_{t+1})\) originate from system disruptions. Agents, mainly Governments and Central Banks, can take some decisions to remedy this situation.

- Central Banks can reduce interest rates and facilitate liquidity to Banks in order to increase investment \((\Delta N \rightarrow \Delta B \rightarrow \Delta D \rightarrow \Delta E)\).
- Central Banks can print money in order to facilitate the Government's spending \((\Delta B \rightarrow \Delta D \rightarrow \Delta E)\).

If there is a savings-investment deficit due to a lack of confidence in the solvency and liquidity of Agents, the following measures could help to restore aggregate demand if they do not increase interest rates or cause a fall in demand.

- Governments can increase spending, issuing public debt and obtaining funds from Banks (savers) \((\Delta O \rightarrow \Delta G \rightarrow \Delta D \rightarrow \Delta E)\).
- Agents can reduce savings or recover previous savings and increase consumption \((\nabla S \text{ or } \Delta B \rightarrow \Delta D \rightarrow \Delta E)\).
- Agents can sell assets or issue bonds and spend the money on new goods and services \((\Delta O + \Delta H \rightarrow \Delta G \rightarrow \Delta D \rightarrow \Delta E)\).
- Agents and Banks can buy foreign assets \((\nabla G \rightarrow \nabla H + \nabla J \rightarrow \Delta (X - M))\) in order to encourage an improvement in the balance of trade.
- Governments and Central Banks can try to devaluate the currency in order to improve the balance of trade, increasing exports \((\Delta X)\) or decreasing imports, which leads to an increase in domestic demand for domestic products \((\nabla M \rightarrow \Delta E)\).

In order to restore the system’s performance to pre-recession levels and increase the volume of lending (investment), Governments need to act simultaneously on Banks and Agents, because credit will not flow unless both the aforementioned have sufficient liquidity and solvency. On the one hand, Governments and Central Banks need to provide liquidity to the Banks and compel them to meet the capital
requirements if necessary. On the other hand, at the same time they need to increase spending in order to ensure the solvency and liquidity of Agents, achieved by Workers getting jobs and Companies obtaining profits.

Governments usually fund their increases in spending by issuing new debt. This option has limitations because savers may not want to fund overburdened governments, as demonstrated by the experience of Greece and other European economies since 2009. When this situation occurs, the lack of a government’s spending capacity can encourage an economic recession (\( \nabla G \rightarrow \nabla D \rightarrow \nabla E \)). Issuing public debt also spurs increases in interest rates for private Agents through the “crowding out” effect and it burdens future generations. Recourse to new debt issuance should be made when Governments build long-lasting intertemporal infrastructures such as roads, ports, schools or hospitals, but not in order to fund current spending. However, since Governments fear that increases in inflation may cause an economic recession in non-indexed economies, they also employ this as a means to fund current spending during recessions in a way that can become unsustainable.

Since Central Banks have the capacity to print money and fund the Government’s spending, Governments always have the capacity to increase domestic aggregate demand (\( \Delta B \rightarrow \Delta D \rightarrow \Delta E \)), spending or transferring money to Households and Companies. Governments have no limits because they can hold their spending without losing financial capacity or burdening future generations, so this is an excellent tool for surviving economic recessions and grant the Agents solvency and liquidity. However, the measure can stimulate inflation, resulting in losses for Agents (inflation tax) and non-indexed loans or bonds, and it can initiate a housing, banking and economic recession (3.3a). Consequently, this measure carries a high risk in non-inflation-indexed economies (Barrull, 2012) and it is only reasonable for full inflation-indexed economies. In addition, printing money erodes the credibility of the currency in non-inflation-indexed economies, because savers can lose their capacity to buy goods and services from that economy. In contrast, in an inflation-indexed economy, savers’ future purchasing capacity remains unaffected and risk premiums remain low.
Increasing aggregate demand or having monetary inflow stability in supply is necessary in order to restore economic growth, but it is not enough. Agents, mainly Companies and Entrepreneurs, have to take advantage of idle resources (factors of production) and transform the monetary inflow into an increase in supply of goods and services. Otherwise, monetary inflows will only enhance inflation. So Governments need to facilitate the Entrepreneurs’ activity and market competition. Likewise, Governments need to assure the system’s aggregate demand without assuring the individual demand or the individual Bank's solvency and liquidity in order to avoid moral hazard.

Trade-foreign investment deficits can be solved by facilitating liquidity to Banks or printing money and spending, if the devaluation of the currency and the improvement of the balance of trade are not enough to hold the aggregate demand. However, there can be changes in demand preferences and temporary non-productive market power increases that can only be solved after a lapse of time facilitating market competition. If Agents and Banks are indebted in foreign currencies, solutions are more problematic, because the devaluation increases the debt and undermines the solvency of Agents and Banks, and the result may be a savings-investment deficit. Governments need to achieve a trade surplus and long-term funding. Currency devaluation helps exports and stimulates foreign demand, although we must remember that trade balances should tend to balance in the long run. Trade-foreign investment deficits can enhance inflation, so inflation-indexed economies are also better prepared to respond to this situation.

In the event of depressions or long-lasting recessions, it is not enough to balance the savings-investment deficit; Governments need to increase demand to a level where Agents can meet their debt commitments.

4.2.2 Non-productive increase in companies’ market power

Increases in companies’ non-productive market power are another source of declines in economic output. This situation can be avoided or overcome by:
a) Promoting antitrust or antimonopoly laws in order to avoid monopolistic or oligopolistic situations that may increase prices and reduce economic output.

b) Promoting technology development, mainly to have as many substitute products as possible.

c) Promoting competition and facilitating the creation of new companies.

d) Mitigating sudden changes in demand, by facilitating unemployment benefits, avoiding the tilt effect with inflation-indexed products, or avoiding significant increases in taxes.

e) Decreasing marginal costs, lowering wages, for example, could also restore economic output. However, this solution is seen as socially and economically undesirable, because it increases the economic differences between Agents without any social or economic benefit. In contrast, if companies achieve market power thanks to their improvements in goods and services or increases in productivity, the society obtains a profit and Entrepreneurs have an incentive to keep improving.

4.3 Sustained growth

Economies cannot completely avoid economic recessions because there are limited resources, but they can mitigate them, reduce the output gap and pursue sustained growth, if they:

a) Build infrastructures that are as resistant as possible to natural disasters.

b) Improve people’s education and skills.

c) Promote entrepreneurship to improve productivity, the quality of goods and services, and the technology to develop substitute products.

d) Facilitate entrepreneurship to transform the increases in demand into increases in output.

e) Keep central banks independent from governments and promote citizen’s control on governments to avoid resource misallocation and stop corruption.

f) Promote a sustainable use of resources, land and sea.
g) Facilitate foreign investments that increase the technology and productivity of the domestic production system.

h) Avoid monopolistic behaviour and promote competition in order to avoid an increase in the companies’ non-productive market power, which can reduce output in the short run and damage the productive entrepreneurial activity (improve the quality of products and productivity) in the long run.

i) Mitigate sudden demand changes, without undermining the entrepreneurs’ activity (they change demand preferences thanks to their improvements) and without promoting moral hazard. For example, by facilitating temporary unemployment benefits, promoting inflation-indexed contracts that avoid the tilt effect, or avoiding significant increases in taxes.

j) Avoid debt in foreign currencies if possible. If not, try to have balanced or positive balances of trade, long-term investors and controls on risk.

k) Appropriate monetary inflows to economic output and growth to maintain the aggregate demand.

l) Avoid disruptions or solve them if they happen. Governments (with Central Banks) have a considerable capacity to avoid a fall in aggregate demand, because they can increase liquidity and spending. Maintaining aggregate demand is the best way to avoid system disruptions, because Agents can maintain their solvency and liquidity and obtain loans from Banks.

m) Promote an inflation-indexed economy in order to avoid inflation-induced problems, and facilitate the Government’s tools in order to restore economic growth.
5. Conclusions

Economic recessions may have many origins although a fall in aggregate demand has been the most common and the most devastating cause in the past. There are many causes of a fall in aggregate demand, such as increases in inflation in non-inflation-indexed economies, increases in real or natural interest rates, stock crashes, housing crises or entrepreneurs’ bad investments, but these situations only have the potential to cause a fall in economic output if they create a disruption in the system, be this a savings-investment deficit or a trade-foreign investment deficit. These disruptions mainly occur pervasively when Agents and/or Banks lose solvency and liquidity.

Economic rigidities, like the nominal value of coins and bills, enhance other rigidities in prices, wages and debts, and hampers reaching stable economic equilibria when aggregate demand falls. In order to avoid the potential economic recessions, aggregate demand in nominal terms always needs to grow. Most developed economies advocate for low inflation levels and try to avoid the risks of inflation with price stability policies. Those policies hamper achieving both goals when inflation rises.

Inflation-indexed economies can avoid disruptions due to increases in inflation, because they avoid the negative consequences of the tilt effect. They also help governments to maintain aggregate demand, because they do not need to increase taxes that decrease private demand or to issue new debt that will burden future generations and undermine their solvency. They can obtain funds from central banks by printing money. Although this measure can enhance inflation, its negative effects are mitigated by the fact that contracts are indexed to inflation, and so the purchasing power of households and savers can remain unaffected. Since inflation-indexed economies can significantly mitigate economic recessions caused by factors related with demand, it is logical to think that limited resources will become the main constraint to economic growth and the principal cause of future economic recessions.
References


