



Cooperation Week – October 16 to 22, 2016

Desjardins supports thousands of student retention and educational success projects, sources of greater economic prosperity. For more information, go to desjardins.com.

October 6, 2016

The helicopter money How does it work and how much would it take?

“Helicopter money” is a term used to describe a specific type of monetary policy: monetary financing. With this type of policy, economic stimulus is no longer primarily provided through the credit channel, but rather by the direct transfer of money from the central bank to the government or consumers. No central bank is currently using this type of stimulus but, given the ongoing trouble some of them are having in stimulating demand and generating inflation, that could eventually change. The Bank of Japan, for example, is struggling to get Japan’s economy out of deflation sustainably.

This *Economic Viewpoint* sets out the pros and cons of monetary financing, and estimates how much money it could take to raise prices by one percentage point. The amounts could end up being fairly small, to avoid the risk of generating too much inflation. Moreover, this instrument should only be considered as a last resort.

THE CURRENT TOOLS HAVE LIMITS

Central banks use a variety of tools to influence economic growth in accordance with their inflation target. Their main tool is interest rate setting, but they may also turn to massive asset purchases, various measures to support the financial system, forward guidance to influence expectations, etc.

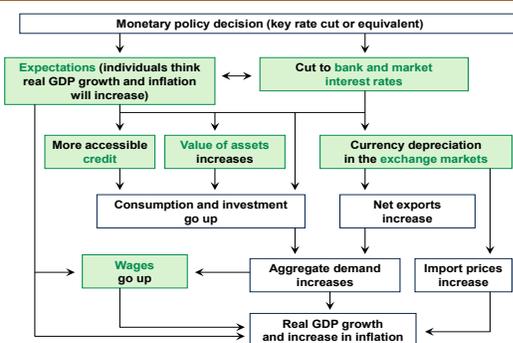
All of these tools use essentially the same transmission channels to ripple through to the economy and inflation (diagram 1). Among other things, they affect market interest rates (bank rates and bond yields). Their magic also works

through the credit market, as well as through exchange rates and asset values. If a central bank has good credibility, its actions will influence expectations for inflation and economic growth, which will also influence interest rates, borrowing decisions, asset valuations and the exchange rate. Consumption and investment will increase if credit is easier to get and if the value of assets goes up (wealth effect). The exchange rate affects the price of imported goods and volume of net exports. All in all, demand will evolve based on consumption, investment and net exports. Greater demand will put upside pressure on wages and the price of goods and services.

The credit channel is probably the most important of these channels and central banks have a lot of difficulty stimulating demand when this channel malfunctions. The case of the euro zone speaks volumes: lowering interest rates into negative territory and massive asset purchases have not been enough to get credit growth near to where it was before the crisis (graph 1 on page 2).

The other transmission channels can partially compensate for the weakness in credit. For example, helped by the falling euro and yen, the Euroland and Japanese trade balances improved substantially in the last few years

Diagram 1 – Monetary policy transmission



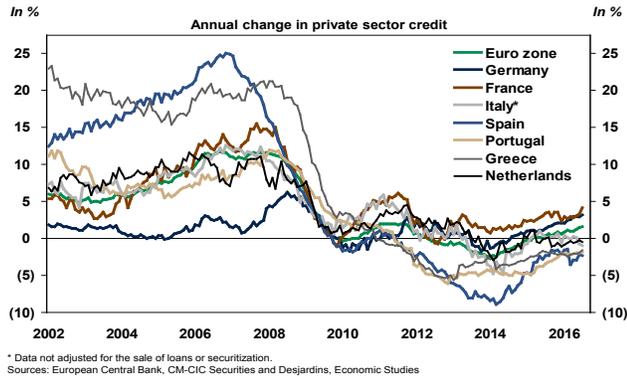
Source: Desjardins, Economic Studies

François Dupuis
Vice-President and Chief Economist

Hendrix Vachon
Senior Economist

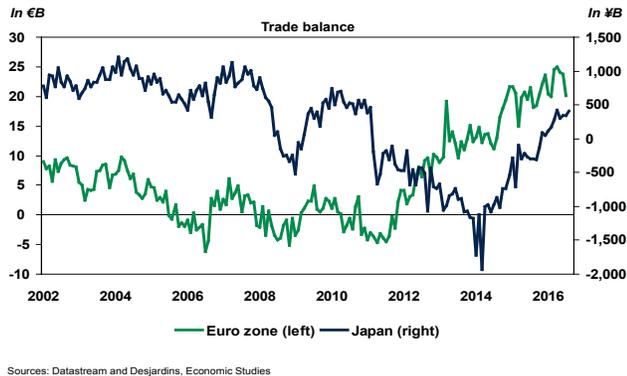
514-281-2336 or 1 866 866-7000, ext. 2336
E-mail: desjardins.economics@desjardins.com

Graph 1 – Little credit in the euro zone despite monetary stimulus measures

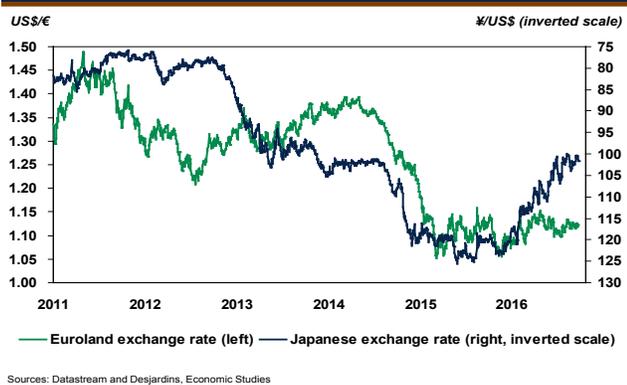


(graph 2). However, it is hard for these trends to keep going. Firstly, the currencies would have to remain low, which is already no longer as true for the yen (graph 3). Then, the existence of trade surpluses in some countries implies trade deficits elsewhere. The economic growth problem has thus only been shifted from one group of countries onto another.

Graph 2 – The trade balance improved substantially in Japan and the euro zone



Graph 3 – The yen has appreciated since the end of 2015



Asset valuation and inflation expectations also have limits. A central bank cannot stimulate the value of the stock market or real estate prices indefinitely without eventually hitting critical levels that could jeopardize long-term financial stability. Regarding the influence over inflation expectations, that depends on a central bank ability to persuade households and businesses that it will reach its target. If the other transmission channels have weaknesses and the inflation target is never reached over time, that will affect the central bank's credibility, making it harder for it to influence expectations.

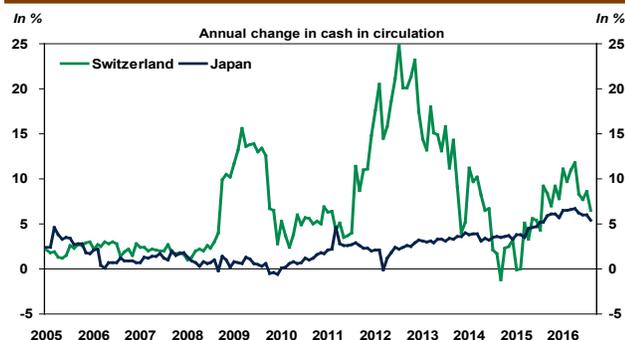
The limitations of current monetary policy tools are not only about transmission channels. A variety of issues are also raised with respect to excessive use of these tools. We have already mentioned the issue of asset valuation with respect to long-term financial stability, which constitutes a risk to economic growth. We could also mention the costs to financial institutions of operating in a low or even negative interest rate environment. Among other things, this is being reflected in the stock market valuations of European and Japanese financial institutions (graph 4). Negative rates are also a long-term threat to pension plans, which have more trouble finding quality assets with satisfactory yields.

Graph 4 – The European and Japanese banking sectors are lagging behind the rest of the economy



Lastly, there is reason for concern about the fallout from a massive shift of deposits toward cash in response to the retail market's application of negative rates. This practice is not at all widespread, but cash growth is accelerating slightly in Japan and Switzerland, a phenomenon that can be associated with the deployment of monetary policies based on negative interest rates (graph 5).

Graph 5 – The amount of cash in circulation is rising faster in Switzerland and Japan



Sources: Datastream and Desjardins, Economic Studies

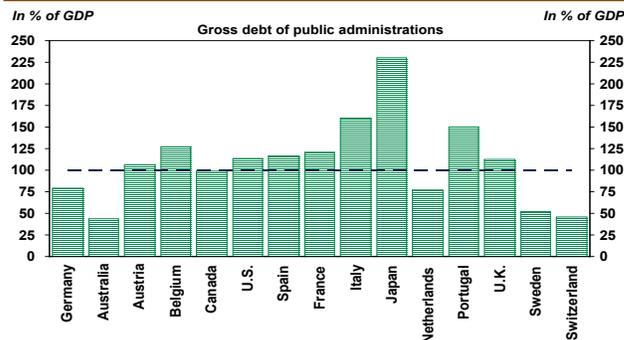
FINDING A NEW WAY TO STIMULATE DEMAND

Given the limits and issues mentioned, some countries may have to find alternate solutions for stimulating demand and driving inflation up. In theory, governments could take up the slack with expansionary budgetary or fiscal policies. Transmission of this type of policy does not rely on an increase in credit, nor is it based on rising asset values and exchange rate depreciation. The connection with demand is more direct. Governments can spend more themselves, which translates directly into higher demand. They can also support business or consumers through tax cuts or transfers. In these cases, it is the increase in consumption and investment that supports demand.

One major constraint limits governments' ability to intervene, however: debt. In many developed countries, public debt already exceeds 100% of GDP (graph 6). Thankfully, the interest rates are currently low, making it easier for them to deal with high debt loads. They can use this leeway to increase public spending, but the impact on demand could still end up being reined in by what is known as the Ricardian equivalence.

The concept of the Ricardian equivalence illustrates the private sector's negative reaction to increased spending by the public sector. If the government has to take on debt to finance its spending, the private sector might anticipate that it will eventually have to pay for the debt, encouraging it to cut back on consumption and investment. The negative effect could be magnified by expectations for interest rate

Graph 6 – Many countries already have very high debt loads



Sources: Organisation for Economic Co-operation and Development and Desjardins, Economic Studies

increases, which would affect the debt's future price tag. And then there's the potential reaction from the financial markets: bigger premiums could be charged to cover the sovereign risk.

IT WOULD BE FREE MONEY

Rather than looking for further effort from already debt-laden governments, monetary financing would be an alternate solution. With this approach, the central banks would stimulate demand through cash transfers to governments or consumers. The principle is similar to that of expansionary budget policy, without the drawbacks of increasing public debt and running up against the problem created by the Ricardian equivalence. In effect, the central banks would create new money to use for monetary financing and that money would not have to be repaid at a later date.

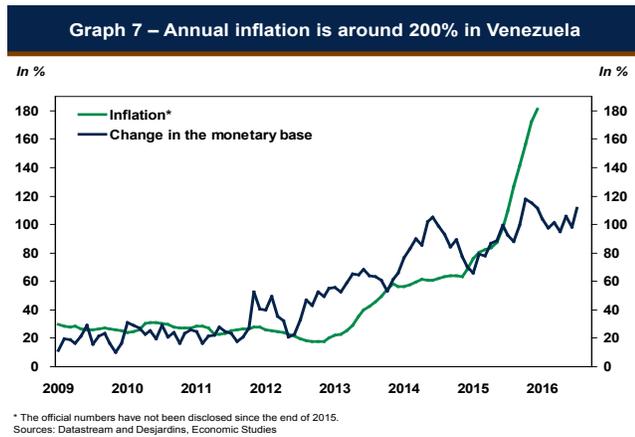
Funds could be transferred in a variety of ways. To transfer the funds to consumers, central banks could write them cheques, but would then have to enter losses on their balance sheets. Losses they would not have to pay back. A decision about whether to send out cheques could be left to the governments, which could also prefer other type of expenditures, such as infrastructure spending. The central banks could then consider a variety of ways to transfer the funds to the governments. They could purchase bonds on the primary market on a promise that public spending would increase. To really reinforce the idea that such operations were irreversible, the bonds issued could be perpetual bonds with a 0% coupon. Another option would involve writing off debt the central banks already hold. This would create new government borrowing capacity, so that they could stimulate demand.

In theory, there are many options for making monetary financing a reality but, in practice, legal aspects would likely limit them. For example, central banks are usually

prohibited from purchasing bonds on the primary market and there are no laws on the books that actually govern sending cheques to consumers. Governments and central banks would have to work together in order to implement monetary financing legally.

NOT A PERFECT SOLUTION

No central bank is currently using monetary financing to support demand and raise inflation by just a few percentage points. Cases such as Venezuela’s are different: in Venezuela, the central bank has to mitigate the government’s inability to get the funding to meet its financial obligations, which has nothing to do with conducting monetary policy in the context of an inflation target. Prices have also skyrocketed there (graph 7). Other notorious cases in which a lack of monetary discipline has led to runaway inflation include Germany between the wars, and Zimbabwe in the early 2000s.



The use of monetary financing as a monetary policy instrument could also result in too much inflation, a major risk. Beyond the legal aspects, the main challenge would be finding the right amount of money. For guidance, the central banks could look at the impacts that previous budgetary plans have had on demand and inflation. However, such spinoffs are not easy to isolate and, among other things, the negative effect of the Ricardian equivalence must be factored in. Another approach is to look to the quantity theory of money for inspiration.

A FUNDAMENTAL CONNECTION BETWEEN THE QUANTITY OF MONEY AND PRICE LEVELS

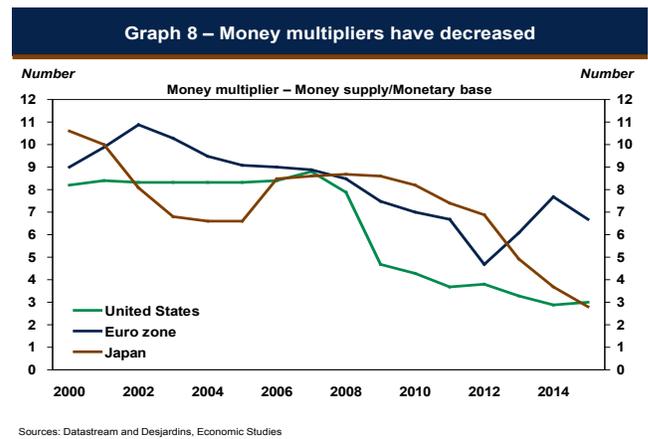
The quantity theory of money describes the long-term connection between the money supply and prices. Beyond cash in circulation, the money supply also includes certain liquid investments that can be used to buy goods and services. In principle, increasing the money supply should result in higher prices, at least over the long term. We can

instinctively imagine what would happen if everybody became a millionaire overnight. Without an increase in production volumes, prices for goods and services would have to go up to maintain the balance between supply and demand.¹

To drive inflation up a few percentage points, it would be enough to increase the money supply by the same proportion. However, central banks only control part of the money supply. When a central bank injects funds into the economy, those funds can be lent and deposited several times through financial institutions; the total of these deposits inflates the money supply. The multiplier effect must be estimated beforehand to determine how much money a central bank should inject.

THE CHALLENGE OF ESTIMATING A SPECIFIC AMOUNT FOR MONETARY FINANCING

The total of the amounts a central bank injects into the economy is called the monetary base. The multiplier effect can be estimated using the ratio between the money supply and monetary base. That being said, this ratio, also called the money multiplier, is not stable over time, far from it (graph 8). Estimated using the M2 monetary aggregate², the multiplier was generally between 8 and 10 in the early 2000s in the major developed nations. These days, it is around 3 in the United States and Japan, and just above 6 in the euro zone.



¹ The quantity equation of money $M \times V = P \times Y$ provides a mathematical depiction of this relationship. The variable “M” represents the money supply, “P” represents price levels and “Y” represents the volume of annual output. A constant, “V”, is added to factor in the fact that a single unit of currency can be used more than once in the same year. Assuming that “V” and “Y” are constant, this equation shows that prices adjust based on the money supply.

² There are several definitions for calculating the quantity of money in an economy. The M2 monetary aggregate includes bank notes and coins in circulation, as well as demand deposits and some term deposits.

One explanation for the multiplier's decline in some countries is that consumers and businesses are less inclined to take on debt. The central banks' huge asset purchases since 2009 have massively increased the quantity of lendable funds, but the money supply has not changed much given a lack of demand for credit. Constraints can also be introduced in the supply of credit. For a variety of reasons, some financial institutions may be more nervous about extending new loans, or simply stricter in their analysis of files.

Monetary financing does not involve the credit channel directly, but can still influence it. An upswing in consumer and business confidence or increase in employment and incomes could stimulate credit. The higher a multiplier was, the less money would need to be injected via monetary financing. In the best case scenario, the multiplier effect could get back to where it was prior to the last crisis.

Estimates were done using the current multipliers and average multipliers in the years 2004 to 2008 (table 1).³ Under certain conditions, it would take the equivalent of US\$12B to US\$17B to increase inflation by 1% in the euro zone. In Japan, it would take US\$11B to US\$31B while, in the United States, it would take between US\$14B and US\$40B. The results are more variable in some countries due to a bigger difference between the current and previous multiplier. Expressed in dollars per capita, the amounts are higher in Japan and Switzerland. This is because of slightly

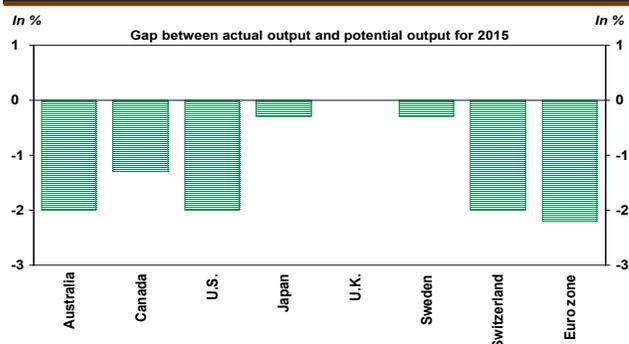
³ To do these estimates, we can start with the quantity equation of money, replacing the variable "M" with "Bm", which is the monetary base times the money multiplier. We then isolate "B" from the rest of the equation, yielding $B = PY / mV$. Numerically, "PY" can be replaced with the value of nominal GDP. Assuming that the value of nominal GDP only changes due to price shifts, the amount needed to raise prices by 1% is then equal to $0.01 \times (\text{nominal GDP} / mV)$.

lower money multipliers, but also because money tends to circulate at a lower velocity in these countries.⁴

ACTUAL NEEDS COULD BE MUCH GREATER

These amounts may seem fairly small: for example, we are referring to about US\$40 per capita in the euro area. In practice, however, some factors could justify more aggressive intervention. To start with, the results were estimated assuming that the volume of output would stay the same. This could occur if the economies were already at full capacity, which is not the case now (graph 9). It would therefore be technically possible to increase output quickly over the short term without having a big impact on prices.

Graph 9 – Underemployment varies from country to country



Sources: Organisation for Economic Co-operation and Development and Desjardins, Economic Studies

⁴ This refers to the parameter "V" in the quantity equation of money, which measures the number of times the same unit of currency is used in a given period. In practice, this parameter is also called the velocity of money. In 2015, the velocity of the M2 monetary aggregate was 0.6 in Japan, 1.0 in the euro zone and 1.5 in the United States.

Table 1
Estimates of amounts required to raise inflation 1%

	2015 nominal GDP	Money velocity	Average multiplier 2004–2008	2015 multiplier	Amounts to inject*		
					billions in local currency	US\$B	US\$ per capita
United States	18,037	1.5	8.3	3.0	14.4 - 39.7	14.4 - 39.7	45 - 123
Japan	499,247	0.6	7.6	2.9	1 192 - 3 076	11.7 - 30.2	92 - 237
Euro zone	10,450	1.0	9.0	6.7	11.4 - 15.3	12.7 - 17.1	37 - 50
United Kingdom	1,870	1.2	16.5	4.2	1.0 - 3.8	1.2 - 4.9	19 - 75
Canada	1,983	1.4	14.6	17.4	0.8 - 0.9	0.6 - 0.7	17 - 20
Switzerland	645	0.7	10.0	1.9	0.9 - 4.7	0.9 - 4.8	112 - 583
Sweden	4,158	1.5	10.9	9.5	2.5 - 2.9	0.29 - 0.34	31 - 36

* Intervals estimated from the average money multiplier of 2004–2008 and the money multiplier of 2015.
Source: Desjardins, Economic Studies

Also, it is possible that a sizable portion of the amounts distributed by central banks would simply go into savings or be used to pay down debt. In both cases, the impact on consumption and investment would be slight, and the increase in prices would be even smaller. The way in which monetary financing would be implemented could, however, influence its efficiency. The chances the injected funds would get spent would probably be higher if they went to governments rather than consumers.

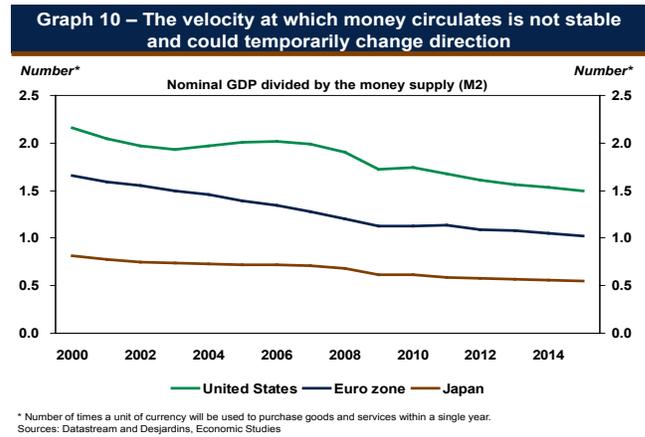
Finally, consumers and businesses might not thoroughly understand how the new policy works. For example, they could continue to think it would affect public debt, or that the central banks' losses would eventually be shifted to governments. They could also worry that inflation would go up too much and the situation would degenerate. This would sap confidence, and create a negative impact on consumption and investment.

STILL PREFERABLE TO MOVE SLOWLY

It would be very important to study the reaction of consumers and businesses. Their behaviour could even suggest more moderate monetary financing if that were to strengthen the sense that central banks would reach their inflation targets faster.

Starting with small amounts would also make it possible to analyze financial market behaviour. Among other things, monetary financing could bring down the currencies involved, or put upside pressure on bond yields, especially long-term bond yields. The possible increase in long-term rates could be supported by an adjustment to expectations for inflation and the future trajectory of key rates. Currently, the markets are expecting few interest rate increases in the coming years, but that situation could change if inflation were to rise more quickly.

Lastly, the relationship between the monetary aggregates and prices has often proved unstable over time. That is why central banks prefer to intervene on interest rates rather than the quantity of money. In addition to changes to the multiplier and the volume of goods and services produced, changes to the speed at which money circulates could also interfere (graph 10). If this parameter rebounds, monetary financing could have a greater impact on inflation than initially anticipated. Here, the cases of Japan and Switzerland, where the speed at which currency circulates is on the slow side, would deserve further study.



IN CONCLUSION: MONETARY FINANCING IS A TOOL FOR EXTREME CASES

Monetary financing could be effective at stimulating the economy and prices in situations in which existing monetary policy tools and governments can no longer do so. The cases closest to this situation are Japan, the euro zone, and a few other European nations. A new shock to the economy and further delay in reaching inflation targets could be a trigger.

However, regulatory aspects would have to be dealt with first. This could be an especially tough challenge in the euro zone and European Union, where supranational rules govern how central banks operate, preventing them from buying government securities on the primary market, for example, and from engaging in any other form of direct financing. Governments would certainly have to be convinced there was an urgent need to act and that the central bank had no alternatives. They would also have to be convinced that they were no longer able to intervene themselves with fiscal policies or with structural measures.

If the laws were amended to govern monetary financing, the main issue would be deciding on the amounts to inject. Based on the quantity theory of money, our estimates show that these amounts could be relatively small, perhaps just US\$40 per capita in the euro zone and US\$90 in Japan, to raise prices 1%. The amounts required could be higher for a variety of reasons but, at the same time, there are a number of grey areas which argue for a very gradual approach. The worst case scenario would, of course, be too much stimulus that would lead to high inflation that was out of the monetary authorities' control. This major risk means that monetary financing cannot be taken lightly and must only be considered as a last resort in extraordinary situations.

Hendrix Vachon
Senior Economist