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CONTENT

INTRODUCTION

Actuality of theme. For several decades after the collapse of the Bretton Woods system of fixed exchange rates in the early 1970s, central banks in the United States and Europe conducted monetary policy in a relatively ad hoc fashion. Policy-makers tried to accommodate the often-conflicting goals of supporting economic growth, limiting inflation and maintaining stable exchange rates. And there was no agreed, centralized 'system' articulating principles by which central banks should operate. That did not mean a complete lack of international coherence in monetary policy-making, however. In the absence of a formalized framework, there was a certain consensus – especially between the United States and Europe – on the characteristics of successful central banking. These norms included the desirability of rigorous inflation targeting and central bank independence from political interference – both seen as essential for such institutions' credibility and for price stability after the abandonment of the gold peg.

The actions of Western central banks since the financial crisis have challenged orthodoxy in four broad areas. In each case, the norms that policy-makers have partially abandoned were developed only within the last 40 years, and the departure from them is indicative of tensions in the post-Bretton Woods economic environment – tensions that for decades have been masked or mitigated by the reduction in macroeconomic volatility associated with the 'great moderation'. Considering the continuing saga of the U.S. double deficit problem, the fundamental value of the dollar must remain in decline for as long as no surpluses are run. In addition, the higher rate of inflation in the U.S. in comparison with the rates in Germany and Japan, continues to erode its value. Assuming that the three anchor currency markets are fully integrated and efficient, the yield curves in the respective markets unbiasedly signal higher short term interest rates to come first in Europe, then Japan and only then in the U.S. But then again, we have seen that foreign governments do not always heed what the private financial markets expect them to do.

A good deal of attention has been directed in recent years to the very interesting and germane question of how far the challenges facing central banks in conducting monetary policy in emerging-market economies differ from those facing

their colleagues in developed countries. In terms of the structure of the policy framework, one obvious common feature is the critical importance of government establishing a disciplined and coherent framework for fiscal and monetary policy to work in mutual support, so that weakness in the public finances does not undermine monetary discipline and so that the commitment to low inflation is seen to be embedded as a key feature of the government's overall economic strategy. Another common feature is the need for the central bank to be able to act independently in pursuing low inflation, and to have the technical expertise and professional competence to do its job and command public confidence. Yet another common feature is the need for the country to have a reasonably developed and competently regulated financial system.

Aspects of estimation the monetary policy researched various economists and scientists. Among of scientists who made a significant contribution to the development of theories and practices of the monetary policy should note: Bernanke B., Borio C., Colla A., Feroli M., Gruber J., Hofmann B., McGuire P., Neely C., Shin H. But until now no research that concerns the question the monetary policy in terms of the dollar expansion that caused the master's thesis theme.

Purpose and tasks of research. The purpose of the master's thesis is research the theoretical base of monetary policy and elaborating the prospects for its implications in terms of dollar expansion.

Based on the research purpose, set in the work the following tasks:

- to analyze the empirical regularities and theoretical implications of exchange rate;
- to describe the economic effects of monetary policy;
- to evaluate the monetary policy under exchange-rate flexibility;
- to analyze the global dollar credit evolution and composition;
- to estimate the monetary policy and US drivers of US dollar credit to non-residents;
- to research the external financial flows and tax revenues for Africa;
- to determine the problems and controversies of monetary policy;

- to propose the implications for monetary policy in terms of dollar expansion.

The research object is the monetary policy in terms of the dollar expansion.

The subject of research is a set of theoretical and practical aspects of monetary policy in terms of the dollar expansion.

Research Methods. Methodological principles of the master's thesis are the provisions of economic theory, research papers of scientists and economists that related with the monetary policy in terms of the dollar expansion. In this paper are used the following methods: logical and theoretical (at research the economic effects of monetary policy), classification (at research the monetary policy and US drivers of US dollar credit to non-residents), system analysis and synthesis (at research the global dollar credit evolution and composition); statistical and economic-mathematical methods (in the analysis of external financial flows and tax revenues for Africa); methods of prediction (in elaboration the implications for monetary policy in terms of dollar expansion).

Scientific novelty of the results is research the the theoretical base of monetary policy and its implications in terms of dollar expansion.

The practical significance of getting results. Developed by the author proposals of implications for monetary policy in terms of dollar expansion can serve as a methodological and practical basis for defining objectives and instruments of monetary policy, in economic-analytical and prognostic of the African Finance Regulatory Authority, African Central Bank, African Monetary Fund, African Investment Bank, departments of foreign relations and economic activity of federal administrations and the current business institutions and investment companies.

Positions presented for protection. All scientific results that are contained in the master's thesis and submitted to the protection are obtained by the author personally.

The structure and scope of thesis. Master thesis total volume is 120 pages, consists the introduction, three chapters, conclusions, lists of used literature of 77 titles and one appendixes by volume 10 pages. Master's thesis is illustrated with 19 figures that are posted at 19 pages and contains 9 tables at 14 pages.

CHAPTER 1. THE THEORY OF MONETARY POLICY AND EXCHANGE RATE DETERMINATION

1.1. Empirical regularities and theoretical implications of exchange rate

Exchange rates and the choice of the exchange rate regime retain a centre stage in the postcrisis environment especially for emerging economies (Klein and Shambaugh 2010; Rose 2011; Ghosh et al. 2014). In particular, there is a significant divide between policy-makers and economists regarding the impact of foreign exchange policies on growth. Whereas laymen and politicians are often intimately convinced that a lower exchange rate will spur growth; economists are generally sceptical that the relative price of two currencies may be a fundamental driver of growth over the long-run. For most economists, the exchange rate is an endogenous variable, whose contribution to growth may be difficult to disentangle. As a matter of fact, the question on whether engineering an exchange rate undervaluation helps medium-term growth is still surprisingly unsettled in the literature. Finding an answer to this question would have far-reaching implications for the design of exchange rate regimes and the international monetary system more broadly [6].

Eichengreen (2008) ofers an excellent review of the debate, including the role of exchange rate regimes and exchange rate volatility. There is a relatively large body of literature suggesting a correlation between the real exchange rate and GDP growth. As long as productivity is higher in the traded goods sector, countries have an incentive to maintain the relative price of traded goods high enough to make it attractive to shift resources into their production. In Aizenman and Lee (2010), Benigno et al. (2015) and McLeod and Mileva (2011) there are learning by doing effects external to the individual firm in the traded goods sector, therefore a weak real exchange rate is needed to support the production of tradables. In these models, an exchange rate undervaluation acts like a subsidy to the (more efficient) tradables sector. In Rodrik (2008), a weak real exchange rate compensates for institutional weaknesses and market failures (e.g. knowledge spillovers, credit market imperfections, etc.) which lead to underinvestment in the traded goods sector in developing countries. In Di Nino at al. (2011), nominal depreciation has persistent

real effects on output growth in a model with Bertrand competition and increasing returns to scale. A different channel is proposed by Glüzmann et al. (2012) where a weak exchange rate leads to higher saving and investment through lower labour costs and income re-distribution. By shifting resources from consumers to financially-constrained firms, real devaluation boosts savings and investment [72].

Most empirical work tends to confirm a positive relation between weak real exchange rates and growth. Dollar (1992) shows that overvaluation harms growth, whereas Razin and Collins (1997) and Aguirre and Calderon (2005) find that large over- and undervaluation hurt growth, while modest undervaluation enhances growth. Similarly, Hausmann et al. (2005) demonstrate that rapid growth accelerations are often correlated with real exchange rate depreciations. Rodrik (2008) finds that the growth acceleration takes place, on average, after ten years of steady increase in undervaluation in developing countries. Di Nino et al. (2011) also conclude that there is a positive relationship between undervaluation and economic growth for a panel dataset covering the period 1861-2011. In addition, the authors show that undervaluation supported growth by increasing exports, especially from high-productivity sectors. Kappler et al. (2011) identify 25 episodes of large nominal and real appreciations in a sample of 128 countries of developing and advanced economies between 1960 and 2008. Farrant and Peersman (2006) show that pure real exchange rate shocks (i.e. separated from the effect of monetary policy) have a substantial contemporaneous impact on output (exchange rate shocks are identified through sign restrictions in a VAR setting). Finally, Glüzmann et al. (2012) find that undervaluation does not affect the tradable sector, but does lead to greater domestic savings and investment, as well as employment, in developing countries. On the other hand, Nouira and Sekkat (2012) find no evidence that undervaluation promotes growth for developing countries, after excluding overvaluation episodes [8].

In the literature, the problem of reverse causality between the exchange rate and growth is usually tackled with the use of GMM. To our knowledge, the only exception is the work by Bussiere et al. (2015) who use a propensity score matching approach – controlling whether real exchange rate appreciations are accompanied by a productivity boom or a surge in capital inflows – to deal with the endogeneity of

real exchange rates. They find that while growth is boosted in countries experiencing an appreciation together with a productivity boom, it is reduced when accompanied by a surge in capital inflows (though the combined effect of appreciation and capital inflows is statistically insignificant) [15].

A central objective of theoretical models of exchange rate determination ought to be a clearer understanding of the economic mechanisms governing the actual behavior of exchange rates in the real world and of the relationships between exchange rates and other important economic variables. In surveying theoretical models of exchange rate determination, therefore, it is appropriate to examine the empirical regularities that have been characteristic of the behavior of exchange rates and other related variables under floating exchange rate regimes. It is also relevant to discuss the minimum requirements for any theoretical model of exchange rate determination to be consistent with these empirical regularities[1].

The Stochastic Behavior of Exchange Rates and Related Variables. Experience with floating exchange rates between the United States dollar and other major currencies (the British pound, the German mark, the French franc, the Swiss franc, and the Japanese yen) during the 1970s has revealed five general characteristics of the behavior of exchange rates and related variables under a flexible exchange rate regime in which the authorities do not intervene too actively in the foreign exchange markets. These characteristics also apply, in general, to the experience with floating exchange rates between major currencies during 1920s and 1930s and, with some modifications, to the experience of floating exchange rates between the United States and Canadian dollars during the 1970s. They do not always apply, however, to situations in which exchange rates have been very actively managed, such as the exchange rate between the Mexican peso and the United States dollar or the exchange rates between currencies within the European Monetary System.

First, statistical examination of the behavior of (logarithms of) spot exchange rates reveals that they follow approximately random walks with little or no drift. The standard deviation of monthly changes in exchange rates between major currencies

[1] Empirical regularities in the behavior of exchange rates and their implications for exchange rate theory are discussed in Mussa (1979); see also Dooley and Isard (1978), Frenkel and Mussa (1980), lsard (1980), and Frenkel (1981).

and the United States dollar (except the Canadian dollar) has been about 3% per month, with changes of more than 5% occurring with moderate frequency. (In comparison, changes in national price levels, measured by consumer price indices, have had a standard deviation of about 1% per month, and monthly changes have virtually never exceeded 5% in major industrial countries during the 1970s.) Moreover, there has been virtually no predictable pattern in monthly exchange rate changes, and, at most, only a small fraction of such changes has been anticipated by the market, as measured by the forward discount or premium. These facts may be summarized in a general characteristic: Monthly changes in exchange rates are frequently quite large and are almost entirely random and unpredictable [12].

Second, analysis of the correlation between contemporaneous movements in spot and forward exchange rates (for maturities extending out to 1 year) indicates that spot and forward rates tend to move in the same direction and by approximately the same amount, especially when changes are fairly large. Some evidence suggests that forward rates are marginally affected by risk premia and hence do not correspond exactly to the market's expectation of the spot exchange rate at the maturity date of the forward contract. This evidence, however, is not sufficiently strong to overturn the assumption that forward rates are reasonable though approximate estimates of the market's expectation of corresponding future spot exchange rates. This assumption, together with the observed contemporaneous correlation of movements in spot and forward rates, implies a second general characteristic of exchange rate behavior: Changes in spot exchange rates which are largely unanticipated correspond fairly closely to changes in the market's expectation of future spot exchange rates [33].

Third, contrary to the doctrine of purchasing power parity (PPP), there has not been a close correspondence between movements in exchange rates and movements in the ratio of national price levels, especially during the 1970. Monthly (or quarterly) changes in exchange rates have averaged about three times as great as monthly (or quarterly) changes in the ratio of consumer price indices, and the correlation between exchange rate changes and changes in the ratio of national price levels has been close to zero. Moreover, while there has usually been positive serial correlation of monthly changes in the ratio of consumer price indices, there has been no corresponding serial

correlation of monthly exchange rate changes. Over longer time periods, such as a year, cumulative divergences from relative purchasing power parity between the major industrial countries have frequently been as large as 10%. Using the concept of the "real exchange rate" (defined as the price of a unit of foreign money in terms of domestic money, divided by the ratio of the home consumer price index to the foreign consumer price index), these facts may be summarized in the following characteristic: Monthly changes in nominal exchange rates are closely correlated with monthly changes in real exchange rates, and cumulative changes in real exchange rates over a period of a year have been quite large [22].

Fourth, during the recent period of floating exchange rates, there may have been a weak general tendency for countries that experienced sharp deteriorations in their current accounts subsequently to experience depreciation in the nominal and real foreign exchange value of their currencies. There also may have been a weak general tendency for countries that experienced sharp appreciations in nominal and real foreign exchange values of their currencies subsequently to experience deterioration in their current accounts. It has not been the case, however, that exchange rates have adjusted rapidly to eliminate current account imbalances, nor has there been strong correlation between exchange rate changes and either levels of changes in current account balances that has held up consistently over time and across countrie[2]. These facts may be summarized in the following characteristic: There is no strong and systematic relationship between movements in nominal or real exchange rates and current account balances that allows for an explanation of a substantial fraction of actual exchange rate movements [40].

Fifth, countries that experience very rapid expansion of their domestic money supplies also experience rapid depreciation of the foreign exchange value of their money, relative to the monies of countries with much less rapid monetary expansion. For countries with only modest differences in their rates of monetary expansion (such as has been true for the major industrial countries during the 1970s), however, there

[2] Some evidence has been presented that movements in current account balances are among the factors influencing movements in exchange rates; see Branson (1976), Branson, Haltunen, and Masson (1977). Dooley and Isard (1978), Dornbusch (1978, 1980a), Isard (1980), Artus (1981), and Driskill (1981). It has not been the case, however, that exchange rates have adjusted rapidly to eliminate current account imbalances or that a large fraction of monthly or quarterly movements in exchange rates is easily explained by movements in current account balances.

is only a tenuous, longrun relationship between high relative rates of monetary expansion and depreciation in the foreign exchange value of domestic money. In particular, there is little or no statistical correlation between monthly changes in exchange rates and monthly differences in rates of monetary expansion for the major industrial countries during the 1970[3]. These facts may be summarized in the following characteristic: Movements in nominal and real exchange rates are not closely related to differential rates of monetary expansion, except possibly for some very highly inflationary economies.

Implications for Theories of Exchange Rate Behavior. One of the implications of these general facts is that no simple model of exchange rate determination provides an adequate explanation of most of the observed movement in nominal and real exchange rates under a floating exchange rate regime. The bulk of observed movements in exchange rates cannot be explained by a naive "payments flows" model, which suggests that exchange rates adjust either immediately or gradually to maintain balance of payments equilibrium. A naive monetary model that relates exchange rate movements to differential rates of monetary expansion (with or without some form of lagged adjustment) does not perform appreciably better in explaining the bulk of exchange rate movements, except possibly for highly inflationary economies. A naive PPP explanation (not really a theory) of exchange rate movements also performs rather poorly [53].

A second important implication of the observed characteristics of the behavior of exchange rates and related variables concerns the general conception of exchange rates as "asset prices." Exchange rates share many of the general behavioral characteristics of the prices of assets that are traded on organized exchanges, such as common stocks, long-term bonds, and various metals and agricultural commodities. Monthly changes in the prices of these assets, like monthly changes in exchange rates (but unlike monthly changes in consumer price indices) are largely random and unpredictable. For assets with quoted spot and future prices, there tends to be a strong correlation between changes in spot prices and contemporaneous changes in futures

[3] For an assessment of the failures of simple monetary models to explain exchange rate movements in the 1970s, see Dornbusch (1978, 1980a), Frankel (1979, 1982), Meese and Singleton (1980), and Meese and Rogoff (1982).

prices, indicating that changes in spot prices are largely unanticipated and correspond fairly closely to changes in the market's expectation of future spot prices. Monthly changes in the prices of assets traded in organized markets are not closely correlated with monthly changes in the general price level, as measured by the consumer price index, implying that most nominal price changes are also real price changes.

These common characteristics in the behavior of prices of assets traded in organized markets suggest that there should be important common elements in the theory of the behavior of such prices. In particular, for any asset that may be held in inventory at a relatively small storage cost and bought and sold with a relatively small transaction cost, we ought to expect that the price today would be reasonably closely linked to the price that is expected at some day in the near future, such as a month hence. The reason for this linkage is that if there were a substantial expected rise in the price of the asset over the course of a month, individuals would have a strong incentive to acquire and hold the asset, putting upward pressure on its current price and downward pressure on its expected future price, until the difference between these two prices was brought within the limits implied by storage and transactions costs [56].

This same argument implies that there should be a reasonably close linkage between the price of an easily storable and tradable asset that is expected 1 month from now and the price of that same asset that is expected 2 months from now, between the price of the asset expected 2 months from now and the price expected 3 months from now, and so on into the more distant future. Through this mechanism, the current price of an easily storable and tradable asset is linked to the economic conditions that are expected to affect the ultimate demand and supply of that asset in all future periods. Expected changes in the prices of such assets should reflect expected changes in the economic conditions that affect the ultimate demand and supply of the asset. In contrast, unexpected changes in the prices of such assets should reflect new information that changes expectations concerning the economic conditions that affect the ultimate demand for and supply of the asset. The observation that changes in many asset prices are largely random and unpredictable reflects the empirical preponderance of unexpected price changes due to new

information over expected price changes in determining the actual behavior of most asset prices [56].

Prior to the monetary-approach emphasis of the 1970s, it was common to emphasize international trade flows as primary determinants of exchange rates. This was due, in part, to the fact that governments maintained tight restrictions on international flows of financial capital. The role of exchange rate changes in eliminating international trade imbalances suggests that we should expect countries with current trade surpluses to have an appreciating currency, whereas countries with trade deficits should have depreciating currencies. Such exchange rate changes would lead to changes in international relative prices that would work to eliminate the trade imbalance. Modern exchange rate models emphasize financial-asset markets. Rather than the traditional view of exchange rates adjusting to equilibrate international trade in goods, the exchange rate is viewed as adjusting to equilibrate international trade in financial assets. Because goods prices adjust slowly relative to financial asset prices and financial assets are traded continuously each business day, the shift in emphasis from goods markets to asset markets has important implications. Exchange rates will change every day or even every minute as supplies of and demands for financial assets of different nations change [58].

An implication of the asset approach is that exchange rates should be much more variable than goods prices. In the 1990s period covered in the table, we observe that spot rates for the countries were much more volatile than prices. Comparing the prices with the exchange rates, we find that the volatility of exchange rates averaged anywhere from 4 to 12 times the volatility of prices. Such figures are consistent with the fact that exchange rates respond to changing conditions in financial-asset markets and are not simply reacting to changes in international goods trade. Exchange rate models emphasizing financial-asset markets typically assume *perfect capital mobility*. In other words, capital flows freely between nations as there are no significant transactions costs or capital controls to serve as barriers to investment. In such a world, covered interest arbitrage will ensure covered interest rate parity:

$$\frac{i - i_f}{1 + i_f} = \frac{F - E}{E}$$

where i is the domestic interest rate and if is the foreign interest rate. Since this relationship will hold continuously, spot and forward exchange rates as well as interest rates adjust instantaneously to changing financial-market conditions.

Sterilization. In recent years, an important topic of debate has emerged from the literature on the monetary approach regarding the ability of central banks to sterilize reserve flows. Sterilization refers to central banks offsetting international reserve flows to follow an independent monetary policy. Under the monetary approach to the balance of payments (with fixed exchange rates), if a country had an excess supply of money, this country would tend to lose international reserves or run a deficit until money supply equals money demand. If, for some reason, the central bank desires this higher money supply and reacts to the deficit by further increasing the money supply, then the deficit will increase and persist as long as the central bank tries to maintain a money supply in excess of money demand. For an excess demand for money, the process is reversed. The excess demand results in reserve inflows to equate money supply to money demand. If the central bank tries to decrease the money supply so that the excess demand still exists, its efforts will be thwarted by further reserve inflows persisting as long as the central bank tries to maintain the policy of a money supply less than money demand. The discussion so far relates to the standard monetary-approach theory with no sterilization [57].

If sterilization is possible, then the monetary authorities may, in fact, be able to determine the money supply in the short run without having reserve flows offset the monetary authorities' goals. This would be possible if the forces that lead to international arbitrage are slow to operate. For instance, if there are barriers to international capital mobility, then we might expect international asset return differentials to persist after a change in economic conditions. In this case, if the central bank wants to increase the growth of the money supply in the short run, it can do so regardless of money demand and reserve flows. In the long run, when complete adjustment of asset prices is possible, the money supply must grow at a rate consistent with money demand; in the short run, the central bank can exercise some discretion. The use of the word *sterilization* is due to the fact that the central bank must be able to neutralize, or sterilize, any reserve flows induced by monetary policy

if the policy is to achieve the central bank's money-supply goals. For instance, if the central bank is following some money-supply growth path and then money demand increases, leading to reserve inflows, the central bank must be able to sterilize these reserve inflows to keep the money supply from rising to what it considers undesirable levels. This is done by decreasing domestic credit by an amount equal to the growth of international reserves, thus keeping base money and the money supply constant.

So far, we have discussed sterilization in the context of fixed exchange rates. Now, let's consider how a sterilization operation might occur in a floating exchange rate system. Suppose the Japanese yen is appreciating against the dollar, and the Bank of Japan decides to intervene in the foreign-exchange market to increase the value of the dollar and stop the yen appreciation. The Bank of Japan increases domestic credit in order to purchase U.S.-dollar-denominated bonds. The increased demand for dollar bonds will mean an increase in the demand for dollars in the foreign-exchange market. This results in the higher foreign-exchange value of the dollar. Now, suppose the Bank of Japan has a target level of the Japanese money supply that requires the increase in domestic credit to be offset. The central bank will sell yen-denominated bonds in Japan to reduce the domestic money supply. The domestic Japanese money supply was originally increased by the increase in domestic credit used to buy dollar bonds. The money supply ultimately returns to its initial level as the Bank of Japan uses a domestic open-market operation (the formal term for central-bank purchases and sales of domestic bonds) to reduce domestic credit. In this case of managed floating exchange rates, the Bank of Japan uses *sterilized intervention* to achieve its goal of slowing the appreciation of the yen with no effect on the Japanese money supply [59].

Sterilized intervention is ultimately an exchange of domestic bonds for foreign bonds. We may well ask how sterilized intervention could cause a change in the exchange rate if money supplies are unchanged. It is difficult to explain in terms of a monetary approach model but not in terms of a portfolio-balance approach. When the Bank of Japan buys dollar assets, the supply of dollar assets relative to yen assets available to private-market participants is reduced. This should cause the yen to depreciate, an effect that is reinforced by the open-market sale of yen securities by

the Bank of Japan. Even in a monetary-approach setting, it is possible for sterilized intervention, with unchanged money supplies, to have an effect on the spot exchange rate if money demand changes. The intervention activity could alter the private-market view of what to expect in the future. If the intervention changes expectations in a manner that changes money demand (e.g., money demand in Japan falls because the intervention leads people to expect higher Japanese inflation), then the spot rate could change.

1.2. Economic effects of monetary policy

Either fiscal policy (defined here as changes in the structural budget deficit) or monetary policy can be used to alter overall spending in the economy. However, there are several important differences to consider between the two. First, economic conditions change rapidly, and in practice monetary policy can be more nimble than fiscal policy. The Fed meets every six weeks to consider changes in interest rates and can call an unscheduled meeting any time. Large changes to fiscal policy typically occur once a year at most. Once a decision to alter fiscal policy has been made, the proposal must travel through a long and arduous legislative process that can last months before it can become law, whereas monetary policy changes are made instantly.

Both monetary and fiscal policy measures are thought to take more than a year to achieve their full impact on the economy due to pipeline effects. In the case of monetary policy, interest rates throughout the economy may change rapidly, but it takes longer for economic actors to change their spending patterns in response. For example, in response to a lower interest rate, a business must put together a loan proposal, apply for a loan, receive approval for the loan, and then put the funds to use. In the case of fiscal policy, once legislation has been enacted, it may take some time for authorized spending to be outlayed. An agency must approve projects and select and negotiate with contractors before funds can be released. In the case of transfers or tax cuts, recipients must receive the funds and then alter their private spending patterns before the economy-wide effects are felt. For both monetary and

fiscal policy, further rounds of private and public decision making must occur before multiplier or ripple effects are fully felt [61].

Second, political constraints have prevented increases in budget deficits from being fully reversed during expansions. Over the course of the business cycle, aggregate spending in the economy can be expected to be too high as often as it is too low. This means that stabilization policy should be tightened as often as it is loosened, yet increasing the budget deficit has proven to be much more popular than implementing the spending cuts or tax increases necessary to reduce it. As a result, the budget has been in deficit in all but five years since 1961, which has led to an accumulation of federal debt that gives policymakers less leeway to potentially undertake a robust expansionary fiscal policy, if needed, in the future. By contrast, the Fed is more insulated from political pressures, and experience shows that it is as willing to raise interest rates as it is to lower them.

Third, the long-run consequences of fiscal and monetary policy differ. Expansionary fiscal policy creates federal debt that must be serviced by future generations. Some of this debt will be "owed to ourselves," but some (presently, about half) will be owed to foreigners. To the extent that expansionary fiscal policy crowds out private investment, it leaves future national income lower than it otherwise would have been. Monetary policy does not have this effect on generational equity, although different levels of interest rates will affect borrowers and lenders differently. Furthermore, the government faces a budget constraint that limits the scope of expansionary fiscal policy – it can only issue debt as long as investors believe the debt will be honored, even if economic conditions require larger deficits to restore equilibrium [67].

Fourth, openness of an economy to highly mobile capital flows changes the relative effectiveness of fiscal and monetary policy. Expansionary fiscal policy would be expected to lead to higher interest rates, all else equal, which would attract foreign capital looking for a higher rate of return. Foreign capital can only enter the United States on net through a trade deficit. Thus, higher foreign capital inflows lead to higher imports, which reduce spending on domestically produced substitutes and lower spending on exports. The increase in the trade deficit would cancel out the

expansionary effects of the increase in the budget deficit to some extent (in theory, entirely). Expansionary monetary policy would have the opposite effect – lower interest rates would cause capital to flow abroad in search of higher rates of return elsewhere. Foreign capital outflows would reduce the trade deficit through an increase in spending on exports and domestically produced import substitutes. Thus, foreign capital flows would (tend to) magnify the expansionary effects of monetary policy [74].

Fifth, fiscal policy can be targeted to specific recipients. In the case of normal open market operations, monetary policy cannot. This difference could be considered an advantage or a disadvantage. On the one hand, policymakers could target stimulus to aid the sectors of the economy most in need or most likely to respond positively to stimulus. On the other hand, stimulus could be allocated on the basis of political or other noneconomic factors that reduce the macroeconomic effectiveness of the stimulus. As a result, both fiscal and monetary policy have distributional implications, but the latter's are largely incidental whereas the former's can be explicitly chosen. In cases in which economic activity is extremely depressed, monetary policy may lose some of its effectiveness. When interest rates become extremely low, interest-sensitive spending may no longer be very responsive to further rate cuts. Furthermore, interest rates cannot be lowered below zero so traditional monetary policy is limited by this "zero lower bound." In this scenario, fiscal policy may be more effective. As is discussed in the next section, some argue that the U.S. economy experienced this scenario following the recent financial crisis.

Of course, using monetary and fiscal policy to stabilize the economy are not mutually exclusive policy options. But because of the Fed's independence from Congress and the Administration, the two policy options are not always coordinated. If Congress and the Fed were to choose compatible fiscal and monetary policies, respectively, then the economic effects would be more powerful than if either policy were implemented in isolation. For example, if stimulative monetary and fiscal policies were implemented, the resulting economic stimulus would be larger than if one policy were stimulative and the other were neutral. But if Congress and the Fed were to select incompatible policies, these policies could partially negate each other.

For example, a stimulative fiscal policy and contractionary monetary policy may end up having little net effect on aggregate demand (although there may be considerable distributional effects). Thus, when fiscal and monetary policymakers disagree in the current system, they can potentially choose policies with the intent of offsetting each other's actions. Whether this arrangement is better or worse for the economy depends on what policies are chosen. If one actor chooses inappropriate policies, then the lack of coordination allows the other actor to try to negate its effects [74].

Federal Reserve Execute Monetary Policy. Congress has delegated responsibility for monetary policy to the Federal Reserve (the Fed), but retains oversight responsibilities to ensure that the Fed is adhering to its statutory mandate of "maximum employment, stable prices, and moderate long-term interest rates." The Fed has defined stable prices as a longer-run goal of 2% inflation (as measured by the Personal Consumption Expenditures price index). The Fed's responsibilities as the nation's central bank fall into four main categories: monetary policy, provision of emergency liquidity through the lender of last resort function, supervision of certain types of banks and other financial firms for safety and soundness, and provision of payment system services to financial firms and the government. The Fed's monetary policy function is one of aggregate demand management – stabilizing business cycle fluctuations. The Federal Open Market Committee (FOMC), consisting of 12 Fed officials, meets periodically to consider whether to maintain or change the current stance of monetary policy. The Fed's conventional tool for monetary policy is to target the federal funds rate – the overnight, interbank lending rate. It influences the federal funds rate through open market operations, transactions that have traditionally involved Treasury securities [75].

The Fed defines monetary policy as the actions it undertakes to influence the availability and cost of money and credit to promote the goals mandated by Congress, a stable price level and maximum sustainable employment. Because the expectations of households as consumers and businesses as purchasers of capital goods exert an important influence on the major portion of spending in the United States, and because these expectations are influenced in important ways by the Fed's actions, a broader definition of monetary policy would include the directives, policies,

statements, economic forecasts, and other Fed actions, especially those made by or associated with the chairman of its Board of Governors, who is the nation's central banker. The Federal Reserve has traditionally relied on three instruments to conduct monetary policy:

1. The primary method is called open market operations, and it involves the Fed buying existing U.S. Treasury securities in the secondary market (i.e., those that have already been issued and sold to private investors). Should the Fed buy securities, it does so with the equivalent of newly issued currency (Federal Reserve notes), which expands the reserve base and increases the ability of depository institutions to make loans and expand money and credit. The reverse is true if the Fed decides to sell securities from its portfolio. Outright purchases of securities were used for QE from 2009 to 2014, but normal open market operations are typically conducted through repos, described in the text box. When the Fed wishes to add liquidity to the banking system, it enters into repos. When it wishes to remove liquidity, as it is planning to do during the normalization period, the Fed enters into reverse repos.

2. The Fed can also change reserve requirements, which specify what portion of customer deposits (primarily checking accounts) banks must hold as vault cash or on deposit at the Fed. Thus, reserve requirements affect the liquidity available within the federal funds market. Statute sets the numerical levels of reserve requirements, although the Fed has some discretion to adjust them. Currently, banks are required to hold 0% to 10% of their deposits that qualify as net transaction accounts in reserves, depending on the size of the bank's deposits. This tool is used rarely – the percentage was last changed in 1992 [76].

3. Finally, the Fed can change the two interest rates it administers directly by fiat, and these interest rates influence market rates. The Fed permits depository institutions to borrow from it directly on a temporary basis at the discount window. That is, these institutions can discount at the Fed some of their own assets to provide a temporary means for obtaining reserves. Discounts are usually on an overnight basis. For this privilege banks are charged an interest rate called the discount rate, which is set by the Fed at a small markup over the federal funds rate. Direct lending, from the discount window and other recently created lending facilities, is negligible

under normal financial conditions like the ones at present but was an important source of liquidity during the financial crisis. In October 2008, the Federal Reserve began to pay interest on required and excess reserves held at the Fed. Reducing the opportunity cost for banks of holding that money as opposed to lending it out should also influence the rates at which banks are willing to lend reserves to each other, such as the federal funds rate [76].

Each of these tools works by altering the overall liquidity available for use by the banking system, which influences the amount of assets these institutions can acquire. These assets are often called credit because they represent loans the institutions have made to businesses and households, among others. The Fed's definition of monetary policy as the actions it undertakes to influence the availability and cost of money and credit suggests two ways to measure the stance of monetary policy. One is to look at the cost of money and credit as measured by the rate of interest relative to inflation (or inflation projections), and the other is to look at the growth of money and credit itself. Thus, it is possible to look at either interest rates or the growth in the supply of money and credit in coming to a conclusion about the current stance of monetary policy – that is, whether it is expansionary (adding stimulus to the economy), contractionary (slowing economic activity), or neutral.

Since the great inflation of the 1970s, most central banks have preferred to formulate monetary policy in terms of the cost of money and credit rather than in terms of their supply. The Fed thus conducts monetary policy by focusing on the cost of money and credit as proxied by an interest rate. In particular, it targets a very short-term interest rate known as the federal funds rate. The FOMC meets every six weeks to choose a federal funds target and sometimes meets on an ad hoc basis if it wants to change the target between regularly scheduled meetings. The FOMC is composed of the 7 Fed governors, the President of the Federal Reserve Bank of New York, and 4 of the other 11 regional Federal Reserve Bank presidents selected on a rotating basis [1].

The federal funds rate is determined in the private market for overnight reserves of depository institutions. At the end of a given period, usually a day, depository institutions must calculate how many dollars of reserves they want or need

to hold against their reservable liabilities (deposits). Some institutions may discover a reserve shortage (too few reservable assets relative to those they want to hold), whereas others may have reservable assets in excess of their wants. These reserves can be bought and sold on an overnight basis in a private market called the federal funds market. The interest rate in this market is called the federal funds rate. It is this rate that the Fed uses as a target for conducting monetary policy. If it wishes to expand money and credit, the Fed will lower the target, which encourages more lending activity and, thus, greater demand in the economy. To support this lower target, the Fed must stand ready to buy more U.S. Treasury securities. Conversely, if it wishes to tighten money and credit, the Fed will raise the target and remove as many reserves from depository institutions as necessary to accomplish its ends. This will require the sale of treasuries from its portfolio of assets [14].

The federal funds rate is linked to the interest rates that banks and other financial institutions charge for loans – or the provision of credit. Thus, whereas the Fed may directly influence only a very short-term interest rate, this rate influences other, longer-term rates. However, this relationship is far from being on a one-to-one basis because the longer-term market rates are influenced not only by what the Fed is doing today but also by what it is expected to do in the future and by what inflation is expected to be in the future. This fact highlights the importance of expectations in explaining market interest rates. For that reason, a growing body of literature urges the Fed to be very transparent in explaining what its policy is and will be and in making a commitment to adhere to that policy. The Fed has responded to this literature and is increasingly transparent in explaining its policy measures and what these measures are expected to accomplish.

Using market interest rates as an indicator of monetary policy is potentially misleading, however. Economists call the interest rate that is essential to decisions made by households and businesses to buy capital goods the real interest rate. It is often proxied by subtracting from the market interest rate the actual or expected rate of inflation. The real rate is largely independent of the amount of money and credit over the longer run because it is determined by the interaction of saving and investment (or the demand for capital goods). The internationalization of capital

markets means that for most developed countries the relevant interaction between saving and investment that determines the real interest rate is on a global basis. Thus, real rates in the United States depend not only on U.S. national saving and investment but also on the saving and investment of other countries. For that reason, national interest rates are influenced by international credit conditions and business cycles.

The recent financial crisis underlines that open market operations alone can be insufficient at times for meeting the Fed's statutory mandate. Since the crisis, many economists and central bankers have argued that a macroprudential approach to supervision and regulation is needed (discussed in the section below entitled "Regulatory Responsibilities"), and this may affect conduct of monetary policy to maintain maximum employment and price stability. Whereas traditional open market operations managed to contain systemic risk following the bursting of the "dot-com" bubble in 2000, direct lending by the Fed on a large scale was unable to contain systemic risk in 2008. This had led to a debate about whether the Fed should be aggressive in using monetary policy against asset bubbles, even at the expense of meeting its mandate in the short term. Traditionally, the Fed has expressed doubt that it could correctly identify or safely neutralize bubbles using monetary policy [13].

Economic Effects of Monetary Policy in the Short Run and Long Run. In the short run, an expansionary monetary policy that reduces interest rates increases interest-sensitive spending, all else equal. Interest-sensitive spending includes physical investment (i.e., plant and equipment) by firms, residential investment (housing construction), and consumer-durable spending (e.g., automobiles and appliances) by households. As discussed in the next section, it also encourages exchange rate depreciation that causes exports to rise and imports to fall, all else equal. To reduce spending in the economy, the Fed raises interest rates and the process works in reverse. An examination of U.S. economic history will show that money- and credit-induced demand expansions can have a positive effect on U.S. GDP growth and total employment. The extent to which greater interest-sensitive spending results in an increase in overall spending in the economy in the short run will depend in part on how close the economy is to full employment. When the economy is near full employment, the increase in spending is likely to be dissipated

through higher inflation more quickly. When the economy is far below full employment, inflationary pressures are more likely to be muted. This same history, however, also suggests that over the longer run, a more rapid rate of growth of money and credit is largely dissipated in a more rapid rate of inflation with little, if any, lasting effect on real GDP and employment. (Since the crisis, the historical relationship between money growth and inflation has not held so far, as will be discussed below) [20].

Economists have two explanations for this paradoxical behavior. First, they note that, in the short run, many economies have an elaborate system of contracts (both implicit and explicit) that makes it difficult in a short period for significant adjustments to take place in wages and prices in response to a more rapid growth of money and credit. Second, they note that expectations for one reason or another are slow to adjust to the longer-run consequences of major changes in monetary policy. This slow adjustment also adds rigidities to wages and prices. Because of these rigidities, changes in the growth of money and credit that change aggregate demand can have a large initial effect on output and employment, albeit with a policy lag of six to eight quarters before the broader economy fully responds to monetary policy measures. Over the longer run, as contracts are renegotiated and expectations adjust, wages and prices rise in response to the change in demand and much of the change in output and employment is undone. Thus, monetary policy can matter in the short run but be fairly neutral for GDP growth and employment in the longer run. In societies in which high rates of inflation are endemic, price adjustments are very rapid. During the final stages of very rapid inflations, called hyperinflation, the ability of more rapid rates of growth of money and credit to alter GDP growth and employment is virtually nonexistent, if not negative.

1.3. Monetary policy under exchange-rate flexibility

The continuing depreciation of the dollar stands out as one of the big policy issues, it has started to impinge on U.S. monetary policy; it influences the chances for international commercial diplomacy, and it is enhancing the move toward European monetary integration. It rather attempts to lay out the basic analytical framework that

has been developed for the analysis of exchange-rate questions and to relate it to the question of monetary policy. It concentrates on the development of the relevant theoretical framework. The main points to be made here are: (1) exchange rates are primarily determined in asset markets with expectations playing a dominant role; (2) the sharpest formulation of exchange-rate theory is the "monetary approach," Chicago's quantity theory of the open economy; (3) purchasing pgwer parity is a precarious reed on which to hang short-term exchange-rate theory; (4) the current account has just made it back as a determinant of exchange rates. The researched covered in this paper has received an extraordinary amount of professional attention in the last few years and much fruitful research has been accomplished. The fine surveys by Isard (1978), Kohlhagen (1978) and Schadler (1977) will place our sketchy review in the perspective of the literature and the books by Black (1977) and Willett (1977) help relate our topic to the ongoing policy discussions [17].

In this part are review the main strands of exchange-rate theory. We start off with two rock-bottom models that, in an oversimplified manner perhaps, represent exchange-rate theory as viewed by the person in «the Street.» These models, purchasing-power parity and a balance-of-payments theory of the exchange rate, each contain, of course, more than a germ of truth and thus serve as a useful introduction to our review. It proceeds from there to more structured models that emphasize macroeconomic interaction or the details of asset markets. These theories can be described as asset-market theories of the exchange rate. Extensions of these models are then considered in an effort to add realism. These extensions deal with expectations, questions of dynamics and of indexing and policy reaction.

Purchasing-Power Parity and the Quantity Theory. The purchasing-power parity theory of the exchange rate is one of those empirical regularities that are sufficiently true over long periods of time to deserve our attention but deviations from which are pronounced enough to make all the difference in the short run. Clearly, purchasing-power parity (PPP for short) is much like the quantity theory of money and indeed can be viewed as the open economy extension of quantity theory thinking [19].

1. PPP Theory: PPP theory argues that exchange rates move over time so as to offset divergent movements in national price levels. A country that experiences a hyperinflation, for example, will experience at the same time a corresponding external depreciation of its currency. The theory leaves open two important operational questions. The first deals with the channels through which this relation between inflation differentials and depreciation will come about. The second question concerns the extent to which PPP is complete, – does it hold in the short run and is there no responsibility for trend deviations over time.

The extent to which PPP holds exactly, at every point in time, and without trend deviation has been an important issue in trade theory. There is no question that theory has shown the possibility of systematic deviation that arises from the existence of nontraded goods. Specifically, Balassa and Samuelson have argued that because services tend to be nontraded, labor-intensive and show low technical progress as opposed to traded manufactures, we would expect fast-growing and innovating countries to experience an increase in their real price level over time. With prices oftradables equalized, the productivity growth in the traded sector would raise wages and the relative price of nontraded goods and thus the real price level in the fast-growing countries [18].

A second source of systematic deviation has been pointed out by earlier literature, including Viner, that dealt with the effect of capital flows or current account imbalance. Here it was argued that a borrowing country has a relatively high (real) price level. The argument here relies on the fact that an increase in aggregate demand, financed by borrowing and a current account deficit, would raise the relative price of nontraded goods and thus the real price level. There are thus two reasons for trend deviations or systematic deviations from PPP that serve as important reservations to the generality of the theory. Setting these reservations aside we are still left with the issue of how rapidly and completely we expect PPP to hold and through what channels it comes about. Here the literature is considerably more diffuse. A hard-core theory, associated with what Marina Whitman (1975) has aptly called "global monetarism" asserts the "law of one price." Goods produced by us and

by our competitors behave as if they were perfect substitutes. Simple arbitrage by market participants will establish uniformity of price in closely integrated markets.

This hard-core view is no longer very fashionable except, of course, for raw materials, commodities and food. A more differentiated view would argue that in the short run and perhaps even in the long run there is substantial scope for product differentiation. Under these conditions price adjustment is no longer a matter of arbitrage but rather becomes a question of substitution. When our prices get out of line with those of our competitors so that we become more competitive, then we would expect demand to shift toward our goods, and in a fully employed economy, start putting upward pressure on costs and ultimately prices. The price adjustment here is certainly timeconsuming; it depends not only on substitutability between supply sources – Okun's distinction between customer and auction markets is important here – but also on the state of slack in the economy and on the expected persistence of real price changes. The description of this mechanism suggests that deviations from PPP are not only possible, but may persist for some time. The empirical content of PPP theory can be summarized as in equation (1):

$$k = (1 - a_1)\bar{k} + a_1 k_{-1} + a_2 z\,;\ 0 < a_1 < 1,\ a_2 > 0$$

where k and k_{-1} measure the current and lagged deviation from PPP, $\bar{k}$ is the equilibrium real price level that has perhaps a time trend and z measures the systematic effect of borrowing or current account imbalance on the deviation from PPP. We would expect al to be positive thus showing some serial correlation or persistence in deviations from PPP.

2. Money, Prices and the Exchange Rate: We turn now to a development of the "monetary approach" of exchange-rate theory. This model or approach combines the quantity theory of money – fully flexible prices determined by real money demand and nominal money supply – with strict PPP to arrive at a theory of the exchange rate. The approach can be simply formulated in terms of a combined theory of monetary equilibrium and exchange-rate determination. Let *M, P, V* and *Y* be nominal quantity of money, the price level, velocity and real income. Then the condition of monetary equilibrium can be written as (2):

$$\frac{M}{P}V(r,Y)=Y$$

where our notation indicates that velocity may be a function of other variables, such as interest rates, r, or income. We can rewrite equation (2), solving for the price level, as (2)`:

$$p=V\frac{M}{Y}$$

which states that for a given velocity an increase in money leads to an equiproportionate rise in the price level. A rise in velocity likewise raises the price level while an increase in real income, by raising real money demand, would lower the equilibrium level of prices. To go from here to a theory of the exchange rate we draw on a strict version of PPP which states that our price level is equal to foreign prices, *P**, converted at the exchange rate, *E* (3):

$$P=P^{*}E$$

where E is the domestic currency price of foreign exchange. Substituting (3) in (2)' yields an expression for the equilibrium exchange rate (4):

$$E=(1/P^{*})V\frac{M}{Y}$$

The equilibrium exchange rate depends on nominal money, real output and velocity. An increase in nominal money or in velocity will depreciate the exchange rate in the same proportion. A rise in real income will lead to appreciation. The theory argues that domestic prices are fully flexible, but are linked to world prices by PPP. Given the nominal quantity of money any variations in the demand for money must be offset by compensating changes in the level of prices and thus in the exchange rate. An increase in real money demand, because say of an increase in real income, will be accommodated by a decline in the level of prices so as to raise the real value of the existing nominal money stock. With a decline in our prices, though, we are out of line with world prices and thus require appreciation of the exchange rate [9].

To complete the theory we note two extensions. First there is symmetry in that the foreign price level, P*, is determined by foreign money demand and supply so that we can write (3) as (4)`

$$E = (\frac{M}{M*})(\frac{V}{V*})(\frac{Y}{Y*})$$

Clearly then, what matters for exchange-rate determination in this view is relative money supplies, velocities and real incomes in the two countries. Our exchange rate will depreciate if, other things equal, our nominal money stock rises relative to that abroad.

The second extension is a specification of a velocity function. Here the tradition has been to assume that velocity depends on real income and the alternative cost of holding rnoney (5):

$$V = Y^{\lambda-1}\exp(\theta r)$$

where r is the nominal rate of interest. The functional form is a matter of expositional convenience and monetary tradition. Substituting (5) in (4)' and taking logs we obtain the standard equation of the "monetary approach" (6):

$$e = m - m^* \lambda(y - y^*) + \theta(r - r^*)$$

where *e, m, m*, y, y** are logarithms of the corresponding capital letter variables. In the final form, equation (6) shows that an increase in our relative money stock or a decline in our relative income will lead to depreciation as would a rise in our relative interest rate. The last conclusion is particularly interesting since it certainly is the opposite of the conventional wisdom that a rise in interest rates will lead to appreciation. We return to the question below when we compare the relation between interest rates and the exchange rate in alternative theories. We note here the explanation: an increase in interest rates reduces the demand for real money balances. Given the nominal quantity of money the price level has to rise to reduce the real money stock to its lower equilibrium level. With our prices thus getting out of line internationally a depreciation is required to restore PPP [5].

Balance-of-Payments Theory of Exchange Rates. A textbook view of exchange rates will argue that the exchange rate adjusts to balance receipts and payments arising from international trade in goods, services and assets. The current account is affected by the exchange rate because it changes relative prices and thus competitiveness, the capital account is affected to the extent that expectational

considerations are important. The theory can be formulated with the help of equation (7):

$$BoP = 0 = C(EP^*/P, Y, Y^*) + K(r, r^*, s)$$

where BoP denotes the balance of payments, EP^*/P measures the relative price of foreign goods and thus serves as a measure of our competitiveness, C denotes the current account, K the rate of capital inflow and s is a speculative variable which we disregard for the present. Figure 1.1 shows the schedule BB along which our balance of payments is in equilibrium, given prices, foreign income and interest rates. A rise in E or a depreciation of the exchange makes us more competitive and thus improves the current account.

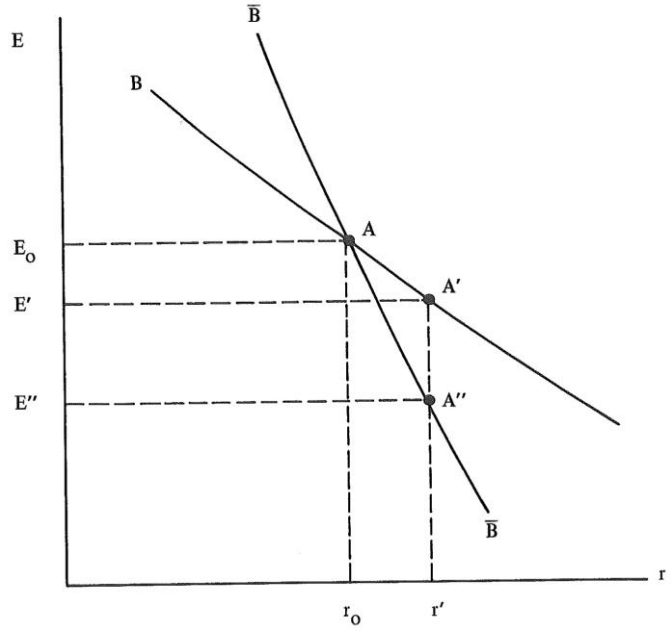

Fig. 1.1. Balance-of-payments theory of exchange rates.

Sourse: [5].

To restore overall balance-of-payments equilibrium, lower interest rates are required so as to generate an offsetting rate of capital outflow. We can readily show that in this framework the exchange rate depends on interest rates, activity levels, relative price levels and the exogenous determinants of the composition of world demand (8):

$$E = E(Y,Y^*, r, r^*, p^*/P)$$

Specifically, an increase in our income, because of say an autonomous increase in spending, will worsen the current account and thus requires an offsetting depreciation. An increase in foreign prices leads to a precisely offsetting appreciation

and an increase in our interest rate leads to an appreciation. The mechanism through which higher interest rates at home lead to an appreciation can be illustrated with the help of Figure 1. In the first place the increase in interest rates will lead to a net capital inflow or a reduced rate of outflow and thus causes the overall balance of payments to move into surplus. The exchange rate will accordingly appreciate – assuming the right elasticities – until we have an offsetting worsening of the current account. This is shown by the move from A to A' on BB.

We may not want to stop at this point but rather recognize that the higher interest rates and the exchange appreciation will exert subsidiary domestic effects. With higher interest rates aggregate demand declines and thus output will fall. The same effect arises from the appreciation and the resulting deterioration of the current account. Thus we have a second round of adjustments to the decline in income which shifts the *BB* schedule inward over time. The longrun balance-of-payments schedule that incorporates the equilibrium level of income implied by the real exchange rate and interest rate is the steeper schedule $\overline{BB}$. In the long run we have further appreciation until point A" is reached [7].

Two points deserve emphasis here. First, the approach views changes in exchange rates as changing (almost one for one) relative prices and competitiveness. It in this respect represents a view opposite to that embodied in the monetary model. Second, it contradicts the monetary model in predicting that an increase in interest rates will lead to an appreciation. I will not pursue this model further, but rather take a specialized version and embody it in a macroeconomic setting.

The Mundell-Fleming Model. The balance-of-payments model has drawn attention to the role of capital flows in the determination of exchange rates. This is also the perspective adopted by the modern macroeconomic approach to exchange-rate determination that originated with the pathbreaking work of Mundell (1968) and Fleming (1962). Their theory argues that the exchange rate enters the macroeconomic framework of interest and output determination because changes in exchange rates affect competitiveness. Depreciation acts much in the same way as fiscal policy by affecting the level of demand for domestic goods associated with each level of output

and interest rate. A depreciation shifts world demand toward our goods and thus acts in an expansionary manner.

The Mundell-Fleming model is illustrated in Figure 1.2 for the case of perfect capital mobility. Perfect capital mobility means that there is only one rate of interest at which the balance of payments can be in equilibrium. If the rate were lower, there would be outflows that would swamp any current account surplus and conversely if it was higher. This is illustrated by the horizontal BB schedule. The LM schedule is the conventional representation of monetary equilibrium. Higher income levels raise the demand for money. Given the money stock, interest rates will have to rise to contain money demand to the existing level of supply. Finally, the 1S schedule resembles that of a closed economy except that it includes as a component of demand net exports as determined by income and competitiveness. That is why a depreciation will shift the IS schedule out and to the right.

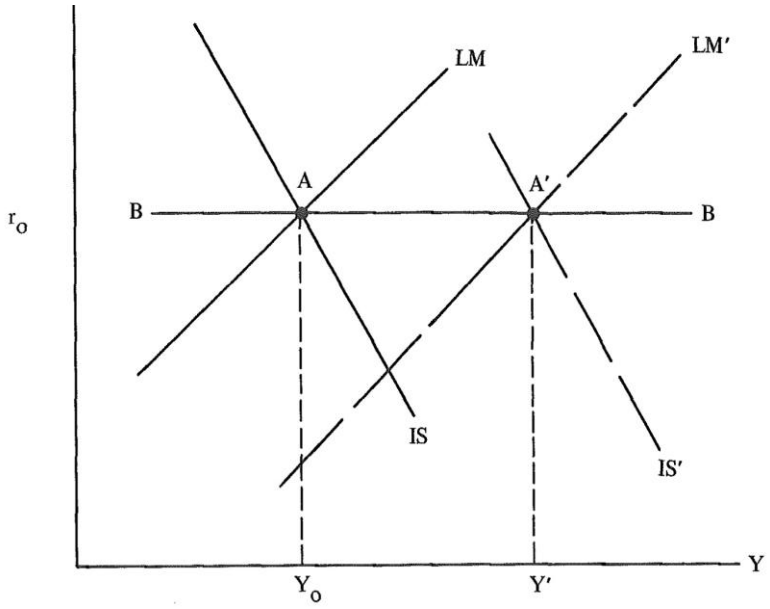

Fig. 1.2. The Mundell-Fleming model.

Sourse: [7].

Consider now a monetary expansion indicated by a rightward shift of the LM schedule. The impact effect is of course to lower interest rates and thus to exert an expansionary effect on demand. The decline in interest rates, however, leads to exchange depreciation because of incipient capital outflows. The depreciation in turn enhances our competitiveness raising demand and shifting the 1S curve to the right

until we reach point A'. Here output and income have risen sufficiently for the increased money stock to be held at the initial rate of interest.

The framework has an important lesson for exchange-rate theory and monetary policy. First, under conditions of perfect capital mobility and given the world rate of interest, monetary policy works not by raising the interestsensitive components of spending, but rather by generating a depreciation and thereby a current account surplus. Monetary policy works not through the construction sector but rather through the net export component of demand. This is of course a striking result, due in part to the small country assumption. It draws attention to the central role of net exports in aggregate demand and to the link between interest rates and exchange rates. It is the latter link that has become central to recent exchange-rate models. The theory implies an equilibrium exchange rate which we can obtain either from the condition of goods market equilibrium (9):

$$E = E\ (r, Y, Y^*, P^*/P\ ...)$$

or as a reduced-form equation of the full system (10):

$$E = E\ (M, Y^*, ...)$$

where the dots denote fiscal policy variables and other exogenous determinants of goods and money demand. It is interesting to note that in (9) an increase in the (world) interest rate, because it reduces aggregate demand and thus creates an excess supply of goods, requires an offsetting depreciation that increases competitiveness and gives rise to a trade surplus.

In its present form the model has three limitations: First, there is no role whatsoever for exchange-rate expectations. This point is important because it implies that strict interest equality must obtain internationally. Second, the model allows for no effect from the depreciation on domestic prices. The depreciation is not allowed to affect either the general price level, and therefore the real value of the money stock, or the price of our output and therefore our competitiveness. It is quite apparent that in fact we should expect at least some spillover into domestic prices and that this spillover will determine the extent to which the real effects of a monetary expansion are dampened [35].

The Portfolio-Balance Model. The Mundell-Fleming model emphasizes the high substitutability between domestic and foreign assets. Capital mobility is perfect so that the slightest deviation of interest rates from the world level unleashes unbounded incipient capital flows. An alternative formulation emphasizes a more limited substitutability between domestic and foreign assets and introduces the level of the exchange rate as a variable that along with asset yields helps achieve balance between asset demands and asset supplies. The model concentrates on asset markets but can readily be extended to include the allocational effects of exchange rates in affecting the current account.

Consider now the basic model as shown in equations (11)-(13) and Figure 1.3. In equation (11) we show the condition of monetary equilibrium where *W* denotes nominal wealth and where $\phi(r,r^*)$ is the fraction of wealth people wish to hold in the form of domestic money (11):

$$M = \phi(r,r^*)W\ ,\quad \phi_r, \phi_{r^*} < 0$$

Equilibrium in the market for domestic assets requires that the existing supply, *X*, equal the demand (12):

$$X = \psi(r,r^*)W\ ,\quad \psi_r > 0\ ,\quad \psi_{r^*} < 0$$

where $\psi(r,r^*)$ is the desired ratio of domestic assets to wealth. The ratio is assumed to increase with the own rate of return and to decline with the return on foreign assets. Equations (11) and (12) together with the wealth constraint:

$$W=M+EF+X$$

imply an equilibrium condition in the market for net external assets (13):

$$EF = (1-\psi-\theta)W = \rho(r,r^*)W\ ,\quad \rho_{r^*} > 0\ ,\quad \rho_r < 0$$

where *F* denotes net holdings of foreign assets measured in terms of foreign exchange. Note that since net external assets can be negative, *p* can be negative. We assume that assets are substitutes so that asset demands respond positively to their own yield and negatively to yields on alternative assets.

In Figure 1.3 we show the money and domestic-asset market equilibrium schedules for given stocks of each of the assets. Along MM the domestic money market is in equilibrium. Higher interest rates reduce money demand so that

equilibrium requires a depreciation and thus a rise in the domestic currency value of foreign assets and hence wealth. The exchange rate thus plays a balancing role by affecting the valuation of assets. Along *XX* the domestic asset market is in equilibrium. Higher interest rates raise the demand for domestic assets and thus require an appreciation to reduce wealth and asset demand thus restoring equilibrium. We want to establish next the effect of changes in foreign interest rates, changes in domestic money or net external assets. In terms of Figure 1.3 an increase in the foreign interest rate creates an excess supply of domestic money and domestic securities thus shifting the *MM* schedule down and to the right and the *XX* schedule up and to the right. Without question the equilibrium exchange rate depreciates.

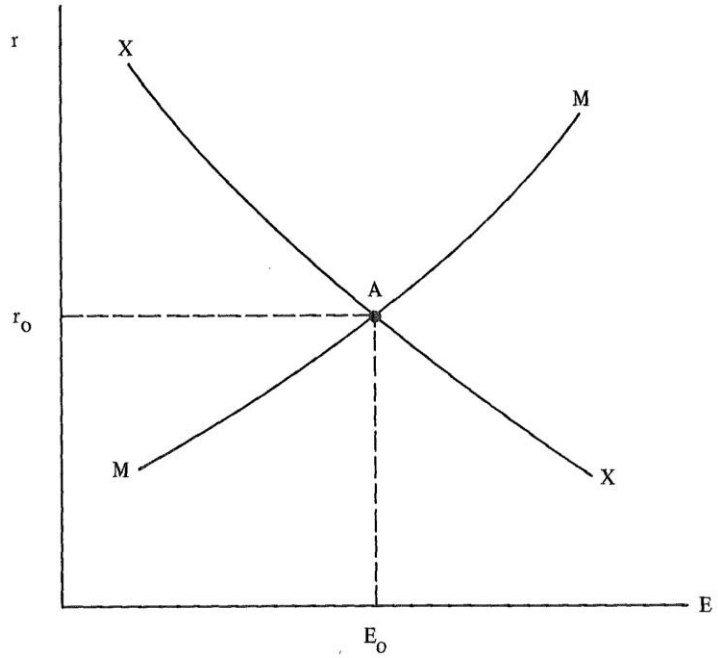

Fig. 1.3. The Portfolio-balance model.

Sourse: [7].

Consider next an increase in the domestic money stock. At the initial equilibrium there will be an excess supply of money and an excess demand for domestic (and foreign) securities. Accordingly the *MM* schedule will shift down and to the right while the *XX* schedule shifts down and to the left. It is readily established that the net effect is unambiguously a depreciation of the exchange rate. Finally we consider an increase in net external assets. Now both the money market and domestic security market schedules shift to the left. They will shift in the same proportion, as inspection of (11) and (12) together with the wealth constraint will reveal.

Accordingly the equilibrium exchange rate appreciates in proportion to the increase in foreign assets.

We have now reviewed a wide spectrum of exchange-rate theories. There is little purpose in endorsing one particular formulation since each of these models seeks to capture a special effect and thus is more or less suitable for a particular instance of policy analysis. Some models view the place of the exchange rate mainly in its short-term effects on competitiveness and its long-term role in keeping prices in line internationally. Monetary and portfolio models assign importance to exchange-rate movements through valuation effects, exchange-rate movements change the real value of the money stock or the relative supplies of domestic and foreign assets. If a choice has to be made between models, then I do see a difference between Quantity Theory-oriented models that leave for the exchange rate the purely passive role of keeping the current stock of real balances just right and expectations-oriented asset-market models in which the current level of the exchange rate is set primarily by references to its anticipated path. In this latter perspective changes in current rates bring about an adjustment dynamics the details of which depend on the differential speeds of adjustment in goods and money markets and where the adjustments that are taking place are quite possibly directed toward events that have not yet materialized but are already anticipated [37].

Monetarist models, of course, also recognizethe importance of expectations. In those models, however, the spot rate is influenced by the effect of anticipated depreciation on real money demand. The anticipation of depreciation would reduce real money demand thus raising the price level and therefore, via PPP, lead to a depreciation of the exchange rate. The extent of the depreciation depends on the interest responsiveness of money demand. By contrast in the present model the anticipation of depreciation leads directly, as of given prices and interest rates, to an equiproportionate depreciation of the spot rate. From the perspective of monetary policy these two strands of modeling differ of course quite radically. The Quantity Theory model assumes quite literally that prices are fully, instantaneously flexible. It thus cannot have any use for monetary policy, except perhaps to stabilize the price level in the face of money-demand fluctuations. All other models, of course, share a

macroeconomic – as opposed to monetarist – persuasion where monetary policy works, more or less, because the central bank can move the real money stock. In this perspective exchange rates become a vehicle for monetary policy. One of the chief channels of monetary policy is the direct effect of money on interest rates and on the exchange rate and thereby on relative prices and aggregate demand.

Conclusions to chapter 1

Identification strategy uncovers a strong and statistically significant positive (negative) effect of real depreciation (appreciation) on real per capita growth over five-year average periods. The effec is visible in developing countries and pegs, and is not significant or wrongly signed in advanced countries and floats, where our instruments are also weaker. On the other hand, the effects appear to be approximately symmetric between appreciations and depreciations, although large depreciations appear to have a stronger impact than large appreciations on average. The effects are much larger than previous comparable results in the literature, which suggests that our identification leads to sharper results. The exchange rates do es matter for growth in developing economies, but substantially less so in advanced ones.

When fiscal and monetary policymakers disagree in the current system, they can potentially choose policies with the intent of offsetting each other's actions. The Fed's responsibilities as the nation's central bank fall into four main categories: monetary policy, provision of emergency liquidity through the lender of last resort function, supervision of certain types of banks and other financial firms for safety and soundness, and provision of payment system services to financial firms and the government. The real rate is largely independent of the amount of money and credit over the longer run because it is determined by the interaction of saving and investment (or the demand for capital goods). The internationalization of capital markets means that for most developed countries the relevant interaction between saving and investment that determines the real interest rate is on a global basis. Economists have two explanations for this paradoxical behavior: they note that, in the short run, many economies have an elaborate system of contracts that makes it

difficult in a short period for significant adjustments to take place in wages and prices in response to a more rapid growth of money and credit and they note that expectations for one reason or another are slow to adjust to the longer-run consequences of major changes in monetary policy.

Modern exchange rate models emphasize financial-asset markets. Asset-approach models may be divided into monetary-approach models, assuming perfect substitutability of assets internationally, and portfoliobalance models, assuming imperfect substitutability. Portfolio-balance models of exchange rate determination add relative asset supplies as a determinant. Central-bank sterilization occurs when domestic credit is changed to offset international reserve flows. Since balance-of-trade flows are balanced by financial-asset flows, changes in the trade balance have a role in asset-approach views of exchange rate determination. If financial-asset markets clear fast relative to goods markets, then the exchange rate may overshoot the new long-run equilibrium after some shock to the system. International currency substitution will add an additional source of exchange rate variability. A high degree of currency substitution breeds currency union. Exchange rates are difficult to forecast because the market is continually reacting to unexpected events or news. Even in the absence of any major news, exchange rates adjust through the day as foreign exchange dealers manage their inventories and respond to trades with others who may be better informed.

CHAPTER 2. GLOBAL DOLLAR CREDIT: LINKS TO US MONETARY POLICY AND LEVERAGE

2.1. Global dollar credit: evolution and composition

Credit denominated in major currencies extended to borrowers outside those currencies' home jurisdictions has implications for monetary and financial stability. Regarding monetary stability, a substantial stock of dollar- or euro-denominated loans implies that the monetary policy of the Federal Reserve or the ECB is transmitted directly to other economies. Moreover, borrowers can choose to borrow dollars or euros instead of domestic currency at the margin, and so side-step their own central bank's monetary policy. Foreign currency credit also has implications for financial stability (CGFS (2011), Domanski et al (2011), Chen et al (2012) and Hills and Hoggarth (2013)). This is because foreign currency and cross-border credit can enable credit booms that lead to crises (Avdjiev, McCauley and McGuire (2012)). Recurring G20 discussion of global liquidity focuses on global credit aggregates.

Dollar credit to non-financial borrowers outside the United States (US), in particular, is large in absolute and relative terms. At approximately $8 trillion in mid-2014, it has reached 13% of non-US GDP (see Fig. 2.1, left-hand panel). Such offshore dollar credit well exceeds its euro and yen counterparts, at $2.5 trillion and $0.6 trillion respectively. Moreover, euro credit is quite concentrated in the euro area's neighbours (Brown and Stix (2015)) [25].

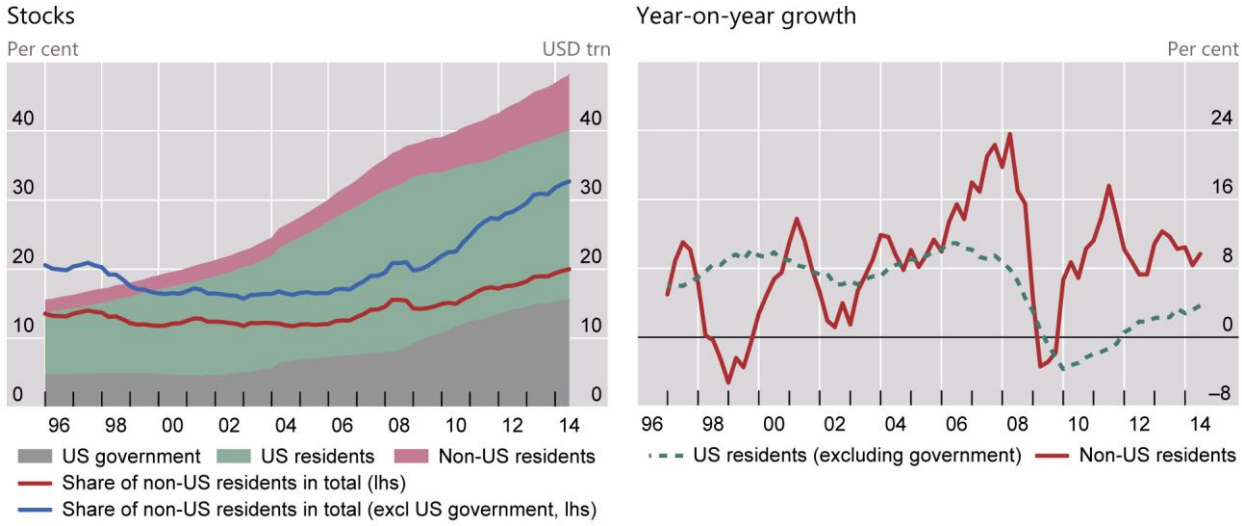

Fig. 2.1. US dollar credit to non-financial firms, households and governments.

Sourse: [IMF, International Financial Statistics.].

Dollar credit to borrowers outside the US behaves differently from the larger stock of credit to those residents in the US. Since the global financial crisis, credit to the US private sector only resumed growing in 2010 while dollar credit to those outside the US has grown since 2009 at often double-digit rates (see Fig. 2.1, right-hand panel). Despite the policy attention to foreign currency credit (ie credit denominated in a currency different from the home currency of the borrower), its drivers remain poorly understood. Existing studies often focus on the generally smaller economies whose banks show high proportions of foreign currency deposits and credit (Levy Yeyati (2006)). That said, there has been important recent work on foreign currency bank credit. Brzoza-Brzezina et al (2010) find that when central banks in central and eastern Europe raise their policy rates, borrowers shift from domestic to foreign currency loans. Bruno and Shin (2014c) find that changes in external interbank claims (mostly dollar) on 46 countries track broker-dealer leverage and the capital of non-US banks. In an aggregate study, Bruno and Shin (2014b) find that a lower policy rate in the US works through bank leverage to increase interbank lending in the rest of the world [25; 34].

Country studies have focused on developments in China. Tang and Ng (2012) show that dollar borrowing costs in the mainland affect the growth of dollar bank credit in Hong Kong SAR, mostly extended to affiliates of mainland Chinese companies. He and McCauley (2013) find that the growth of foreign currency (mostly dollar) loans extended by banks in mainland China rises in response to a lower dollar Libor or a lower onshore dollar rate. Shin and Zhao (2013) analyse Chinese and other Asian firms and find a grossing up of their assets and liabilities, suggesting that access to offshore credit is associated with financial investment, possibly including dollar-funded investment in domestic currency. Other studies have focused on the role of bond markets in international credit. Cohen (2005) models the choice of currency in international bond issuance, including dollar bonds. Shin (2013) emphasises that the remarkable rise in bond market financing in recent years means that bank debt alone cannot be the focus of study in what he calls the second phase of global liquidity. The high share of the US dollar in international bonds is recorded annually by the ECB (2014) and is highlighted by Goldberg (2013). Lo Duca et al

(2014) measure the response of corporate bond issuance in all currencies to Federal Reserve bond buying [38].

The baseline aggregate of dollar credit to non-financial borrowers outside the US is comprised of outstanding bank loans and bonds. For bank loans, we sum dollar loans to non-banks (including nonbank financial firms) booked both locally (within the respective economy) and cross-border. For bonds, we sum outstanding dollar obligations of non-financial sector borrowers resident outside the US. In classifying bond issuers, we look through the immediate borrower (eg Petrobras International Finance Company, Cayman Islands) to the ultimate borrower's sector (eg oil, that is, non-financial). The resulting $8 trillion aggregate for June 2014 includes bank loans to all non-banks but includes dollar bonds issued only by non-financial issuers. Our econometric analysis mainly focuses on this narrower aggregate. It maximises the comparability to non-financial debt in the US flow of funds statistics by excluding bonds issued ultimately by non-bank financials. Alternatively, a more comprehensive (and internally consistent) aggregate includes bonds issued by non-bank financials (eg the German state agency KfW with $100 billion in US dollar debt). This takes the aggregate up to $9 trillion (see Fig. 2.2, left-hand panel).

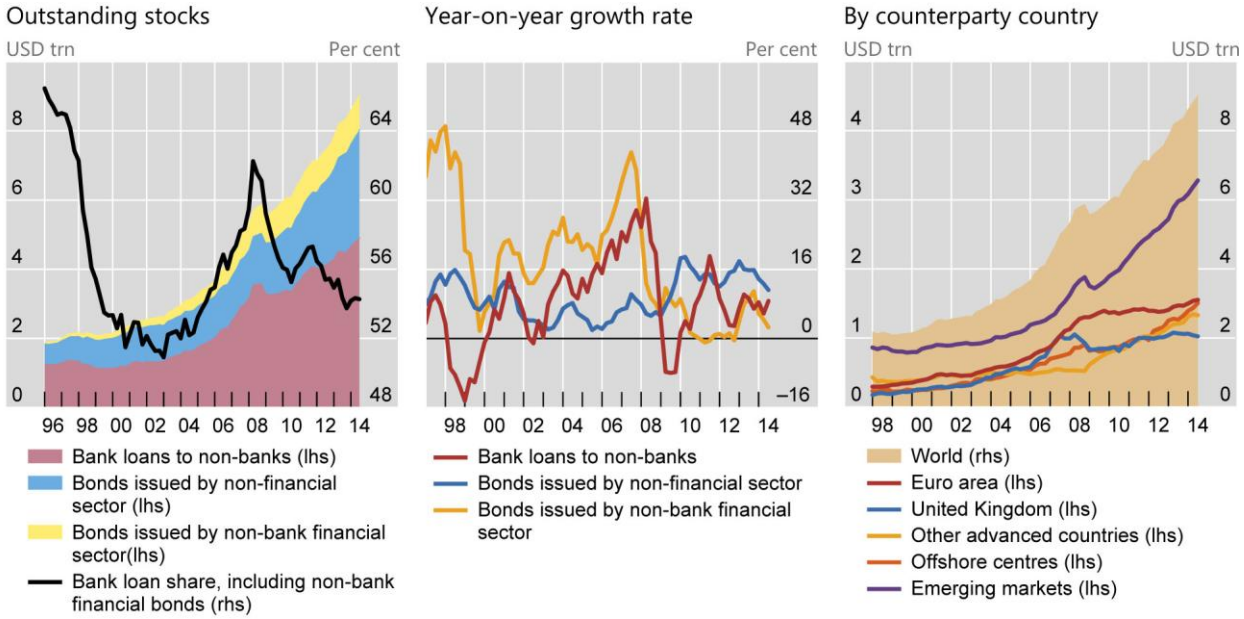

Fig. 2.2. US dollar credit to non-banks outside the United States.

Sourse: [IMF, International Financial Statistics; Datastream.].

For this to measure the debt of non-financial borrowers, however, KfW's dollar loans to non-financial borrowers outside the US would have to match its dollar bond

debt. The share of bank loans has fallen since the global financial crisis to 55% of the broader aggregate. The next subsections describe the small connection of dollar credit outside the US to US balance sheets and profile its trends and geography. The final subsection reports a panel analysis showing that higher foreign yields lead to more rapid offshore dollar credit growth [42].

The US connection. US financial institutions or US-sourced funds do not play a dominant role in dollar credit extended to borrowers outside the US. Shifting to data for the end of 2013, only $2.3 trillion ($2.1 trillion) out of the $8.6 ($7.6 trillion) in dollar claims on non-banks (non-financials) outside the US were held in the US (see Fig. 2.3, middle two arrows). In other words, offshore holdings represent almost three-quarters of the dollar credit extended to non-financial borrowers outside the US. This is possible because non-US banks operating outside the US have trillions of dollars of deposits (He and McCauley (2012)), and can swap other currencies into dollars. Similarly, asset managers located outside the US have large dollar assets under management. Thus, depositors and investors outside the US can and do provide most of the dollar credit to non-US borrowers.

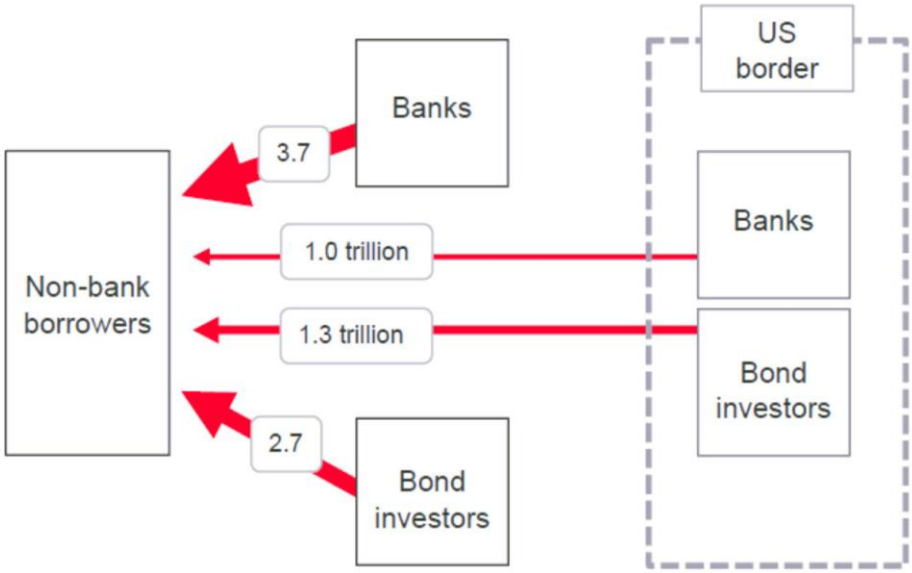

Fig. 2.3. US dollar-denominated credit to non-bank borrowers outside the US, end-2013.

Sourse: [US Department of the Treasury (2014); BIS.].

The small US role holds particularly in banking, where the loans booked in the US, loans booked by US-headquartered banks or funding from the US all play bit parts. In particular, in December 2013, $1 trillion out of $4.7 trillion of dollar bank

loans to non-US residents were booked in the US (see Fig. 2.3, top two arrows): in other words, about 80% of the dollar bank loans to borrowers resident outside the US are booked at banks outside the US. Moreover, these US dollar loans are not funded by borrowing from banks in the US. This contrasts with a popular metaphor that the Federal Reserve's large-scale asset purchases inject liquidity into banks in the US that spills over the border to offshore banks, which then lend out the dollars. Contrary to this image, banks headquartered outside the US shifted after the global financial crisis from a "net due to" position vis-à-vis their branches in the US to a "net due from" these dollar funding. In sum, dollar bank loans extended to borrowers outside the US do not depend much on the US banking system [26].

US residents play a larger role in holding US dollar bonds issued by borrowers outside the US (see Fig. 2.3, bottom two arrows). Of the $4.0 trillion ($3.0 trillion) outstanding dollar bonds issued at end-2013 by non-US resident non-banks (non-financials), US residents held $1.3 trillion ($1.1 trillion). If USbased investors hold a third of dollar bonds issued by non-US residents, the ease of financing in the international bond market could well be affected by the common element in US ("spread product") bond flows identified by Feroli et al (2014). We return below to the significance of the observation that US bond investors play a larger role in dollar bond credit than US banks play in dollar bank credit.

Growth profile of offshore US dollar credit. There is only one federal funds rate and only one dollar Libor, but there are two stocks of dollar debt responding in very different fashion to these interest rates. From a time series perspective, the offshore aggregate has behaved quite differently from its larger US aggregate, not least since the global financial crisis. Coming out of the Asian financial crisis of 1997-98, dollar credit to non-US residents only briefly grew faster than US debt before the dot.com crash and subsequent recession. Then, in the later boom years of the 2000s, offshore dollar credit grew more rapidly than its larger US counterpart, only to drop more sharply during the 2008-09 financial crisis. Since 2009, dollar credit to non-financial borrowers outside the US has consistently grown faster than that extended to US residents. In particular, its growth rate hovered near 10% and rose to as high as 15% before the worst of the European sovereign and bank strains.

In contrast, dollar credit to private US non-financial borrowers only started growing again in 2010 [32].

Looking back over the cycle of the 2000s, much of the procyclicality of the growth of dollar credit extended to borrowers outside the US arose from bank loans. Bond market credit showed more stable growth. Indeed, despite the practical closure of the bond market to all but the best issuers in late 2008, the year-over-year growth of bonds outstanding issued by non-US nonfinancial firms never turned negative. And, since 2009, it has grown at about a 15% rate, faster than the growth of bank credit to non-US non-banks, which decelerated into 2012 in response to the worsening of the European sovereign strains. (An even larger divergence in the growth of US dollar bank loans and bonds outstanding was also observed during the Asian financial crisis). The resulting falling share of dollar loans relative to dollar bonds is reinforced by banks' diminished role as bond market investors: both point to a smaller role of banks in global dollar credit. In particular, banks' holdings of US dollar bonds issued by non-US residents hit a nine-year high just before the crisis, reflecting banks' easy access to funding and the market's acceptance of high bank leverage (see Fig. 2.4).

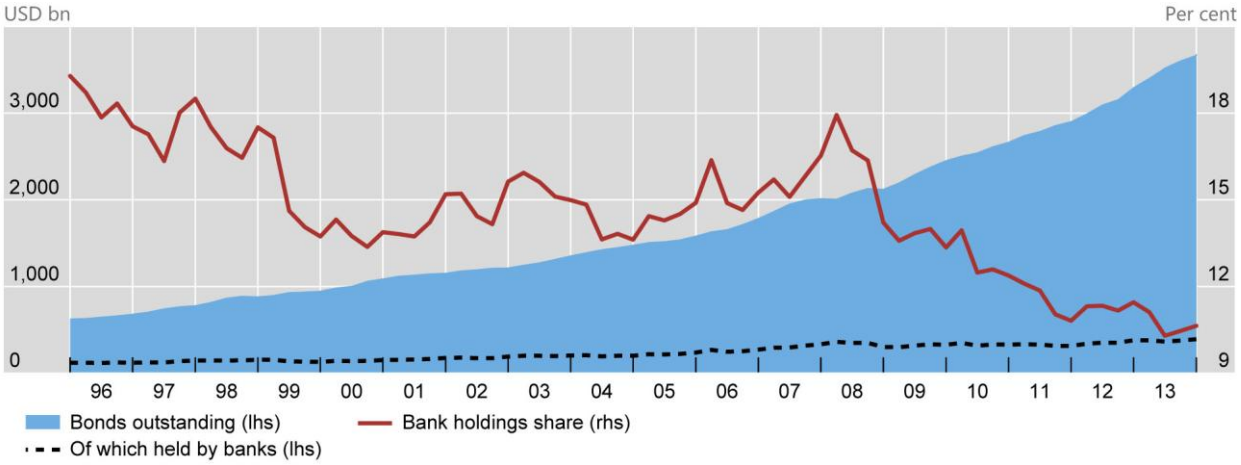

Fig. 2.4. Banks' share in holdings of dollar bonds issued by non-banks outside the US.

Sourse: [BIS locational banking statistics; BIS international debt securities statistics.].

Since Q4 2007, banks have reduced their holdings from $672 billion to $570 billion in Q4 2013, that is from a sixth to a tenth of all non-US non-banks' US dollar bonds (red line, right-hand scale). Thus, non-bank investors have not only taken up the large increase in outstanding dollar bonds, but have also absorbed the bonds

released by deleveraging banks. In particular, they increased their holdings from $1.3 trillion to $3.1 trillion between Q4 2007 and Q4 2013. These analisys of more rapid growth in dollar bonds compared to dollar loans, along with increased specialisation on the buy side, suggest that the drivers of bank and bond components of dollar credit to non-US borrowers may well differ. Moreover, compression of long-term bond yields through unconventional monetary policy by the Federal Reserve in recent years has introduced a new policy influence on both investors' demand for bonds and borrowers' choice between bank borrowing and bond issuance.

The geography of US dollar credit outside the US. Before the global financial crisis, much of it is extended to borrowers in advanced economies: the euro area, the UK, Japan, Canada and the Nordic countries. In fact, the share of dollar credit to emerging market borrowers fell from around half to about a third on the eve of the global financial crisis. Yet, since 2009, it has since recovered to almost half. An immediate implication is that not all that much of the dollar credit outside the US is extended to borrowers in dollarised economies. While studies of such economies at their broadest would focus on economies in which a tenth or more of bank loans are dollar-denominated, offshore dollar credit is mostly found in economies where it represents a single-digit percentage of credit. Thus, the top three stocks of dollar credit are in jurisdictions that are not usually thought of as dollarised: the euro area, China and the UK. The euro area and China have single-digit dollarisation rates, while the UK is higher, in the mid-teens [50].

Other larger emerging market economies, like Brazil, India and Korea, have rates around 10%. Dollar credit reaches a fifth to a third in places with closer ties to the US like Mexico and the Philippines and high fractions in Bolivia, Peru and Cambodia. But these do not contribute very much to overall dollar credit to borrowers outside the US. Dollar credit to Brazilian, Chinese and Indian borrowers has grown rapidly since the global financial crisis (see Fig. 2.5). On this measure, which includes offshore bond issuance by non-banks' financial subsidiaries outside the country (dark blue area), dollar borrowing has reached more than $300 billion in Brazil, $1.1 trillion in China, and $125 billion in India. The rapid growth of bonds

relative to loans is more evident in Brazil and India than in China. Indeed, in China and India, dollar credit continues to be extended mostly through bank loans [50].

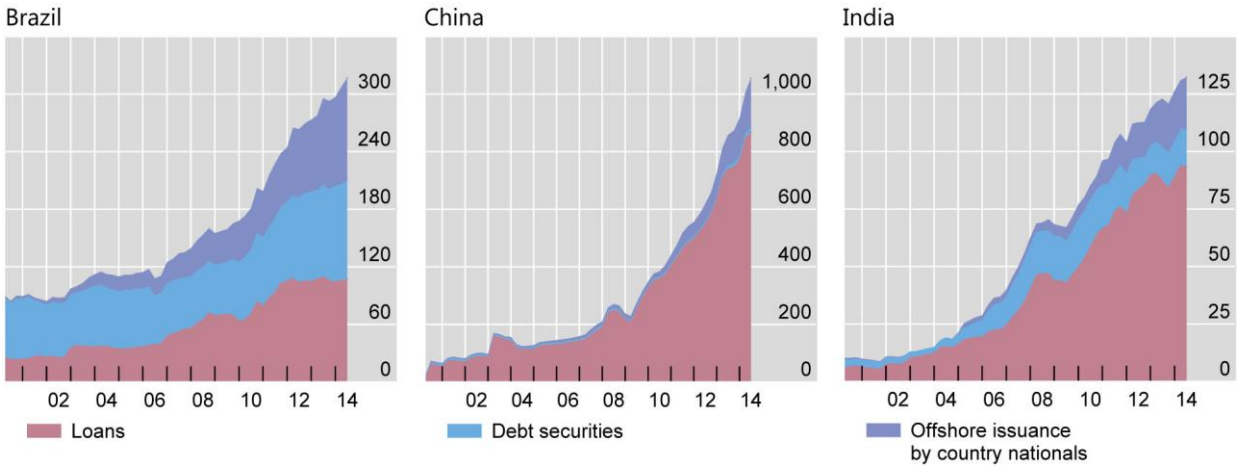

Fig. 2.5. US dollar credit to non-financial borrowers from Brazil, China and India, billions of US dollars.

Sourse: [BIS locational banking statistics; BIS international debt securities statistics.].

The extent and rate of growth of dollar credit would be understated if one were to neglect the area at the top in the panels of Fig. 2.5 showing the bonds issued by affiliates of Brazilian or Chinese firms incorporated outside Brazil or China. The balance sheets of emerging market multinational firms span the national border, so balance of payments data do not capture their consolidated accounts. Interpreting the flows of funds through the consolidated balance sheets of multinational firms (eg Chinese real estate developers selling high-yielding dollar bonds in Hong Kong) represents a big analytical challenge.

Foreign interest rates and US dollar credit to non-residents. As highlighted in the previous section, the largest recipient economies of US dollar credit tend to be emerging market economies with relatively high domestic interest rates. In order to check whether interest rate differentials relative to the US are systematically associated with US dollar credit, we run panel regressions on a sample of 22 major economies over Q1 2000 to Q2 2014[4]. We regress the quarterly change in the US dollar credit to GDP ratio in country i, $(CRED^{j}_{i,t}/GDP_{i,t} - CRED^{j}_{i,t-1}/GDP_{i,t-1})$, on the spread in policy rates between country i and the US and the corresponding spread in

[4] The panel is unbalanced due to late starts for 10-year government bond yield data for some emerging market economies. Economies included are Argentina, Australia, Brazil, Canada, Switzerland, Colombia, China, Czech Republic, UK, Hungary, Indonesia, India, Japan, Korea, Mexico, Malaysia, Poland, Russia, Thailand, Turkey, euro area and South Africa.

10-year bond yields, both lagged by one quarter. For US dollar credit, we consider three alternative aggregates, designated as *Loan*, *Bond* and *Credit (= Loan + Bond)* in Tables 2.1 and 2.2 below. Country and time dummies control for other factors.

Table 2.1

Panel regressions of US dollar credit on yield differentials, full sample.

Dependent variable	*(1)* *Δ(Credit/GDP)*	*(2)* *Δ(Credit/GDP)*	*(3)* *Δ(Loan/GDP)*	*(4)* *Δ(Loan/GDP)*	*(5)* *Δ(Bond/GDP)*	*(6)* *Δ(Bond/GDP)*
ΔPolicy rate gap	0.095* (0.050)	0.013 (0.022)	0.032** (0.015)	0.022 (0.014)		-0.009 (0.013)
Δ10-year yield gap		0.078 (0.056)		0.023 (0.043)	0.052* (0.028)	0.056** (0.028)
Country dummies	yes	yes	yes	yes	yes	yes
Time dummies	yes	yes	yes	yes	yes	yes
Observations	1,195	1,106	1,231	1,136	1,106	1,106
R-squared	0.124	0.155	0.106	0.108	0.180	0.183

Notes: The table reports regressions of quarterly changes in US dollar credit to non-financials in country i scaled by country i's GDP on the lagged change in the policy rate and 10-year yield differential relative to US, including full country and quarterly dummies; unbalanced panel of 22 countries from Q1 2000 to Q2 2014; robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

We find that wider policy rate differentials are associated with a bigger change in US dollar credit relative to GDP (Table 2.1, column (1)). Decomposing aggregate US dollar credit, bank loans in particular seem to grow faster relative to GDP following a widening of the policy rate gap in the previous quarter. The coefficient on the policy rate gap (column (3)) indicates that a 1 percentage point widening in a country's policy rate relative to the federal funds rate is, on average, associated with 0.03% more dollar bank loans relative to GDP in the following quarter. For their part, dollar bonds outstanding grow faster relative to GDP following a widening of the long-term yield gap (column (6)); a 1 percentage point increase in the 10-year yield gap is associated with 0.06% more in non-banks' dollar bonds relative to GDP in the following quarter. Thus, US dollar bank lending responds to policy rates, which set benchmark rates in money markets (eg US dollar Libor), which in turn form the basis of banks' US dollar funding costs and customer lending rates. For its part, US dollar bond market credit shows a tighter relation with benchmark longterm bond yields, as these could determine relative funding costs for non-bank US dollar bond issuers relative to their own currency.

Next, we re-analyse dollar bank loans and bonds separately for pre- and post-crisis periods, excluding 2008 from both. While a wider gap in policy rates is associated with faster US dollar bank loan growth relative to GDP in both periods, a wider long-term yield gap is associated with faster US dollar bond growth relative to GDP in the post-crisis period only (Table 2.2, columns (1) and (3) versus (2) and (4)). In addition, notwithstanding the unchanging federal funds target in the post-crisis period, the association of US dollar bank loan growth with policy rate gap strengthens, driven by changes in policy rates by other central banks.

Table 2.2

Panel regressions of US dollar credit on yield differentials, pre- and post-crisis.

	Pre-2008		Post-2008	
Dependent variable	(1) Δ(Loan/GDP)	(2) Δ(Bond/GDP)	(3) Δ(Loan/GDP)	(4) Δ(Bond/GDP)
ΔPolicy rate gap	0.029* (0.015)		0.181*** (0.058)	
Δ10-year yield gap		0.045 (0.037)		0.086*** (0.032)
Country dummies	yes	yes	yes	yes
Time dummies	yes	yes	yes	yes
Observations	659	572	484	454
R-squared	0.115	0.131	0.159	0.259

Notes: The table reports regressions of quarterly changes in US dollar credit to non-financials in country i scaled by country i's GDP on the lagged change in the policy rate and 10-year yield differential relative to US, including full country and quarterly dummies; unbalanced panel of 22 countries from Q1 2000 to Q2 2014; robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

The coefficient of 0.18 on the policy rate gap in the post-crisis period in column (3) of Table 2.2 implies that a 1 percentage point wider gap in policy rates is associated with 0.18% more US dollar bank loans relative to GDP in the following quarter. Given that the average ratio of US dollar bank loans to GDP in our sample is 5.3%, holding GDP constant, this means a boost of approximately 4% (eg 0.18/5.3) to the stock of US dollar bank loans from a 1 percentage point foreign policy rate hike (or 1% more US dollar bank lending for every 25 basis points). This finding is consistent with that of Bruno and Shin (2014c), who find a statistically significant association between cross-border bank flows and the interest rate spread between local lending rates and the US federal funds rate.

2.2. Monetary policy and US drivers of US dollar credit to non-residents

This subchapter examines the association between the growth of US dollar credit to non-residents and measures of the US monetary policy stance as well as financial market volatility and cost of leverage. In contrast to section 2.4, which used panel regressions at the country level and non-US interest rates, this section focuses only the time series of aggregate US dollar credit to non-US, non-financial borrowers. We also abstract from non-US interest rates in recognition that much of US dollar borrowing takes place through offshore subsidiaries of global firms whose spreads relative to US interest rates are determined by a complex mix of different yields on different currencies, which cannot be inferred from their location. We focus on financing conditions in US dollar funding markets as a generally relevant common factor regardless of the borrower's location.

Monetary policy stance: For monetary policy, we consider both indicators of conventional short-term policy rate setting and indicators of long-term rates, which are related to unconventional bond buying (see Fig. 2.6). First, we regress the aggregate of US dollar bank loans to non-US residents on various US dollar interest rates and proxies for financial sector leverage. Then we do a similar analysis of aggregate outstanding dollar bonds. The ordinary least squares time-series regressions are conducted with stationary explanatory variables [63].

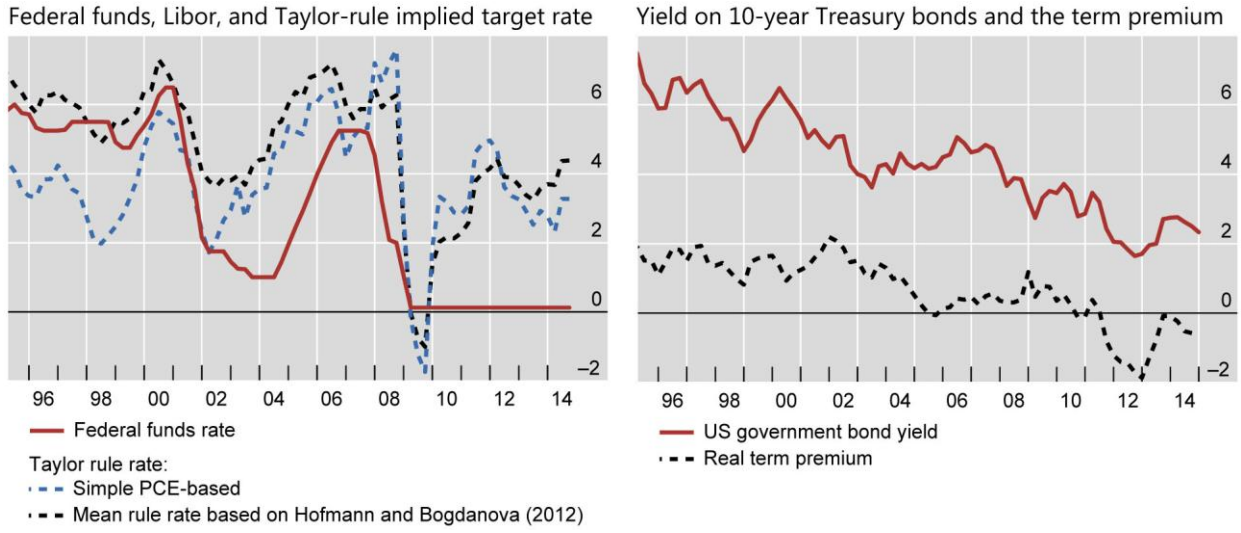

Fig. 2.6. Short-term and long-term financing conditions in US dollars.

Sourse: [Bloomberg; Consensus Economics; Hofmann and Bogdanova.].

Leverage: Our indicators of financial system leverage include the VIX and financial commercial paper plus primary dealer repo outstanding. Figure 2.7 (left-

hand panel) shows that the quantity measures of leverage are closely associated with the VIX, which may be capturing risk-on/sell-out spirals to the extent that it proxies for the value-at-risk constraint of leveraged investors. Hence, one way to interpret the VIX (which, after all, is just a measure of implied volatilities of S&P500 index options) is that it captures swings in the shadow cost of leverage by financial institutions managing risk against a value-at-risk constraint or the like. Thus, one may expect that the VIX, along with other measures of leverage, would have a closer association with the behaviour of global banks than with that of bond investors, which would include not only leveraged investors but also real money accounts (eg pension funds). For analogous price and quantity measures for bond markets, we rely on the MOVE index of bond market volatility and an indicator of US flows into fixed income credit. In particular, we follow Feroli et al (2014) and construct an indicator of flows into bond mutual funds. Specifically, we use the first principal component of net flows into investment grade, emerging markets, and mortgage-backed security bond funds, adjusted for assets under management (see Fig. 2.7, right-hand panel).

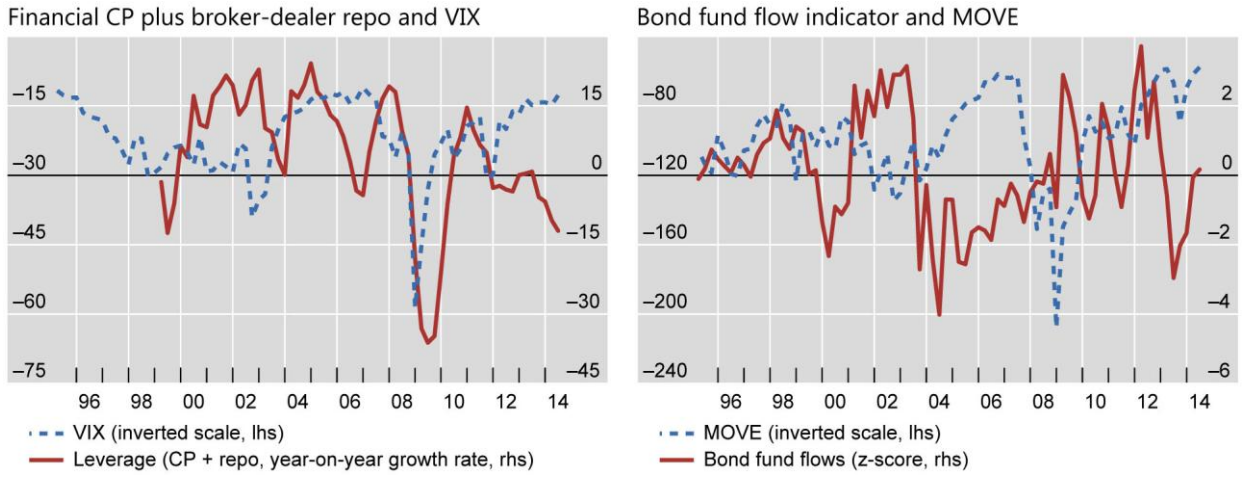

Fig. 2.7. Quantity and price indicators of financial intermediary leverage.

Sourse: [Bloomberg; EPFR; Lipper; Federal Reserve Bank of New York; Feroli.].

Dollar bank credit to borrowers outside the US. A scatter plot makes evident the negative association between a federal funds rate set below that prescribed by a Taylor rule and the growth in US dollar bank loans to borrowers outside the US (see Fig. 2.8, centre and right-hand panels). A low level of the federal funds rate in relation to US inflation and the output gap is associated with higher growth of dollar loans to borrowers outside the US. The association is statistically significant at a 1%

level. In fact, when the effective federal funds rate is below that prescribed by the Taylor rule, hardly any instances of year-on-year shrinkage in offshore US dollar bank lending are observed (particularly for the simple PCE-based Taylor rule). Rather, most of the observations are in the upper left-hand quadrant of the graph, indicating positive offshore US dollar loan growth, with abundant observations of double-digit growth.

Next, we look at the association between the federal funds rate, volatility and the cost of leverage and US dollar bank credit to non-US residents while also controlling for global factors. Unit roots in year-on-year growth rates in the US dollar credit series as well as in the Taylor rule-adjusted federal funds rates in levels prevent us from running time-series regression on the same series as shown in the scatter plot. Therefore, in these regressions we enter log differences for the quantity variables to make them stationary, and first differences for prices and interest rates. Table 2.3 shows the results for the growth in the bank loan component of US dollar credit to non-US residents as the dependent variable. The time-series regression is specified as follows:

$$\Delta \log LOAN_t = \alpha + \beta_R^L \Delta STRATES_{t-1} + \beta_V^L VOLA/LEVERAGE_{t-1} + \beta_X^L X_t + \varepsilon_t$$

where $LOAT_t$ denotes US dollar credit extended through bank loans in quarter t, $STRATES_{t-1}$ is the federal funds rate less the Taylor rule rate in quarter t-1, $VOLA/LEVERAGE_{t-1}$ refers to either one-quarter lag level of the VIX or log-difference of financial CP plus primary dealer repo, and X_t is a vector of global controls. As noted, these include credit growth outside the US, the growth in the volume of world trade, and the Federal Reserve's broad nominal US dollar index. These controls can be seen as a reduced-form representation of supply and demand factors of US dollar credit extended via a global bank intermediation chain modelled in Bruno and Shin. On the supply side, banks' ability to leverage up and to raise wholesale funding in US dollars plays a key role. These factors are proxied by the VIX and the sum of US financial CP and primary dealer repo plus reverse repo. On the demand side, the incentive and capacity to borrow in US dollars increases with US dollar depreciation (appreciation of local currency). As in Bruno and Shin, a low federal funds rate can

spur bank cross-border lending indirectly through either higher leverage or US dollar depreciation. The addition of world trade captures other factors affecting aggregate demand and supply of international credit, as well as proxying for global business cycle more broadly [46].

The coefficients on federal funds rate deviations from the Taylor rule are not significant, which runs contrary to our expectations. This result arises because the growth in bank loans to non-US residents continued to rise even when the Federal Reserve raised the federal funds rate towards the Taylor benchmark in 2004-06, then fell in tandem with the federal funds rate in late 2008, as the Federal Reserve rapidly lowered its target to zero by Q4 2008 in the face of a rapid pullback of banks from international lending (see Fig. 2.8, left-hand panel). In 2004-06, banks took comfort from the Federal Reserve's "measured pace" of very gradual tightening after a long period of exceptionally low rates. This induced low volatility and allowed banks to leverage up despite steady increases in the federal funds target. The weaker results concerning the federal funds rate in the regression that also includes leverage and US dollar exchange rate variables are in line with the results of Bruno and Shin [69; 70].

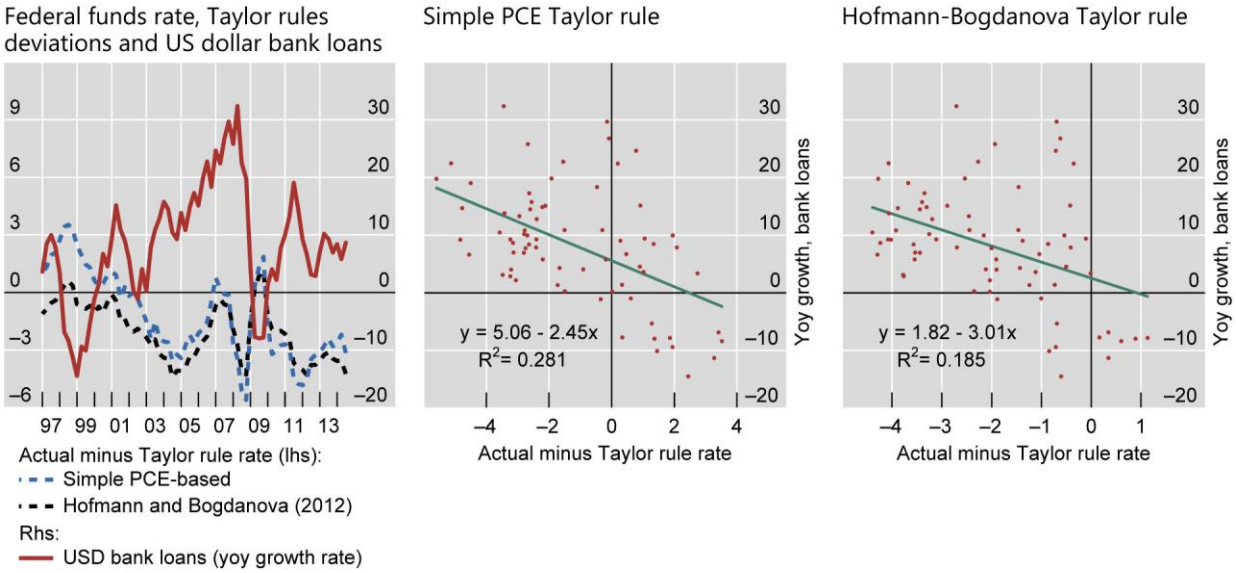

Fig. 2.8. Offshore dollar bank loan growth and federal funds deviations from Taylor rules.

Sourse: [Hofmann and Bogdanova; Bloomberg; BIS locational banking statistics.].

Moving to the effects of leverage and wholesale funding, leverage, however measured, drives the pace of offshore dollar bank lending. The coefficient in Table 2.3, column (1) indicates that a one per cent higher wholesale market leverage

growth is associated with 0.13 per cent higher growth rate of aggregate dollar credvit in the following quarter. Similarly, the coefficients on the VIX in columns (2) and (3) indicate that a onve per cent increase in annualised financial market implied volatility is associated with a 0.12 to 0.15 per cent lower growth rate of US dollar credit to non-US residents the following quarter. These results are robust to the inclusion of global factors: the US dollar exchange rate or world trade growth. Finally, in line with greater incentives to borrow offshore US dollars when the dollar depreciates, the coefficient on US dollar nominal effective exchange rate is negative (specification (3)).

Table 2.3

Drivers of offshore US dollar bank loan growth.

Dependent variable: $\Delta \log LOAN_t$	(1)	(2)	(3)
ΔFed funds deviation from Taylor rule[5]	0.295 (0.487)	0.169 (0.505)	0.519 (0.513)
Δlog (leverage (CP + repo))[6]	0.134* (0.071)		
VIX[7]		-0.148*** (0.045)	-0.116** (0.053)
Δlog (US dollar NEER)			-0.391* (0.227)
Δlog (World trade)			-0.003 (0.0v95)
Constant	2.026*** (0.416)	5.171*** (1.001)	4.531*** (1.214)
Observations	64	73	73
R-squared	0.042	0.116	0.173

Notes: Dependent variable is the quarterly growth in US dollar bank loans to non-US resident non-financial sector borrowers, in per cent. All explanatory variables lagged by one quarter. Sample period from Q1 1996 to Q2 2014; robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Dollar credit has flowed since the global financial crisis to an unusual extent to emerging markets and to advanced economies that were not hit by it. Dollar credit has grown slowly in two economies where dollar credit was large and growing rapidly before the crisis, namely the euro area and the UK. In other words, since the crisis, dollar credit has grown fastest in the economies with relatively high domestic interest rates. These observations are corroborated by panel regression results. These

[5] Federal funds target rate and the rate implied by the Taylor rule using the output gap and PCE inflation: $i = r^* + p + 0.5 (p-p^*) + 0.5(y-y^*)$; in first differences, per cent.
[6] Sum of US financial CP and broker-dealer repo and reverse repo outstanding.
[7] Chicago Board of Exchange S&P500 index option implied volatility (annualised volatility in per cent).

wider policy rate differentials relative to the federal funds rate spur subsequent quarter US dollar bank loan growth across 22 countries over the past 15-year period. At the same time, wider 10-year yield differentials spur subsequent quarter growth in US dollar bonds outstanding. In addition, these associations appear to have strengthened post-crisis. Non-bank investors have extended an unusual share of dollar credit to non-US residents since the crisis. Such credit flowed through the international bond market to an unprecedented extent, while banks have stepped back as holders (and issuers) of bonds. Non-bank investors have not only bought all the net increase in bonds outstanding but taken up the bonds that have come out of bank portfolios. Prior to the crisis, the familiar drivers of international bank credit played a predominant role in offshore US dollar credit growth. Bank leverage (as measured by financial CP and broker-dealer repo), or low-cost leverage (as measured by the VIX) set the pace for offshore dollar lending, as measured by quarterly growth rates. For the longer run (eg year on year rather than quarterly growth rates), we document that the level of the federal funds rate matters. When the effective federal funds rate is below that prescribed by the Taylor rule, offshore dollar lending generally grows and often at double-digit rates [45].

Over the first half of the year, monetary policy remained accommodative to support further improvement in labor market conditions and a return to 2 percent inflation. In particular, the Federal Open Market Committee (FOMC) maintained the target range for the federal funds rate at ¼ to ½ percent. This unchanged policy stance was supported, among other factors, by the FOMC's assessments in the first months of the year that global economic and financial developments posed risks to the economic outlook, and in June that recent information indicated that the pace of improvement in the labor market had slowed. In addition, the Committee's policy stance reflected its expectation that inflation would remain low in the near term. Looking ahead, the FOMC expects that economic conditions will warrant only gradual increases in the federal funds rate. In determining future adjustments to the federal funds rate, the Committee will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments.

After raising the target range for the federal funds rate last December to between ¼ and ½ percent, the Committee has maintained that range over the first half of the year (see Fig. 2.9). This unchanged policy stance was supported initially by the Committee's assessment that global economic and financial developments posed risks to the economic outlook, as expressed in its March 2016 statement, and by its judgment in April that growth in domestic economic activity appeared to have slowed. In June, the Committee noted that recent information indicated that the pace of improvement in the labor market had slowed, while growth in domestic economic activity appeared to have picked up in the spring. The decision to maintain the target range for the federal funds rate also reflected the Committee's expectation that inflation would stay low in the near term, partly because of earlier declines in energy prices and in the prices of non-energy imports, as well as recently elevated uncertainty about the possible consequences of the U.K. referendum on European Union membership for the U.S. economic outlook [49].

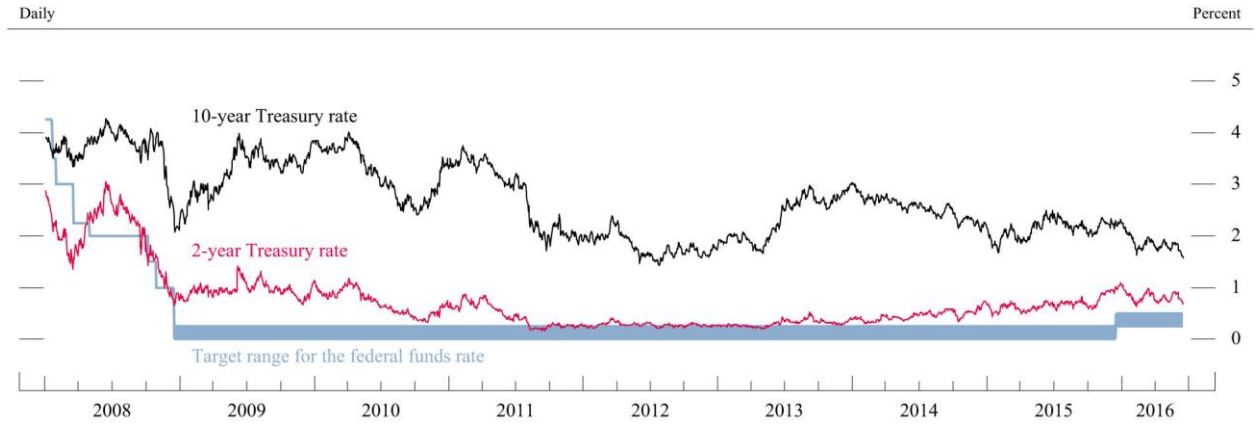

Fig. 2.9. Selected interest rates.

Sourse: [Department of the Treasury; Federal Reserve Board.].

Over the first half of 2016, the Committee remained particularly attentive to risks to the U.S. economic outlook posed by global economic and financial developments. The Committee noted earlier in the year that it was closely monitoring such developments and assessing their implications for the labor market and inflation and for the balance of risks to the outlook. The Committee subsequently indicated that these concerns had attenuated, but that it would continue to closely monitor inflation indicators and global economic and financial developments. The Committee continued to expect that the federal funds rate was likely to remain, for some time,

below levels that were expected to prevail in the longer run, and that with gradual adjustments in the stance of monetary policy, economic activity would expand at a moderate pace and labor market indicators would continue to strengthen. The Committee also continued to expect inflation to remain low in the near term but to rise to 2 percent over the medium term as the transitory effects of past declines in energy and import prices dissipate and the labor market strengthens further [49].

The FOMC continued to emphasize that, in determining the timing and size of future adjustments to the target range for the federal funds rate, the Committee would assess realized and expected economic conditions, as informed by incoming data, relative to its objectives of maximum employment and 2 percent inflation. This assessment would take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments. In light of the current shortfall of inflation from 2 percent, the Committee indicated that it would carefully monitor actual and expected progress toward its inflation goal. Stronger growth or a more rapid increase in inflation than the Committee currently anticipates would likely call for faster increases in the federal funds rate; conversely, if conditions prove weaker, a lower path of the federal funds rate would likely be appropriate [65].

To help maintain accommodative financial conditions, the Federal Reserve kept its holdings of longer-term securities at sizable levels over the first half of the year. In particular, the Committee maintained its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities and of rolling over maturing Treasury securities at auction, and it anticipates doing so until normalization of the level of the federal funds rate is well under way. With the continuation of the Committee’s reinvestment policy, the Federal Reserve’s total assets have held steady at around $4.5 trillion (see Fig. 2.10). Holdings of U.S. Treasury securities in the System Open Market Account (SOMA) have remained at $2.5 trillvion, and holdings of agency debt and agency mortgage-backed securities at approximately $1.8 trillion.

Consequently, total liabilities on the Federal Reserve's balance sheet were mostly unchanged [77].

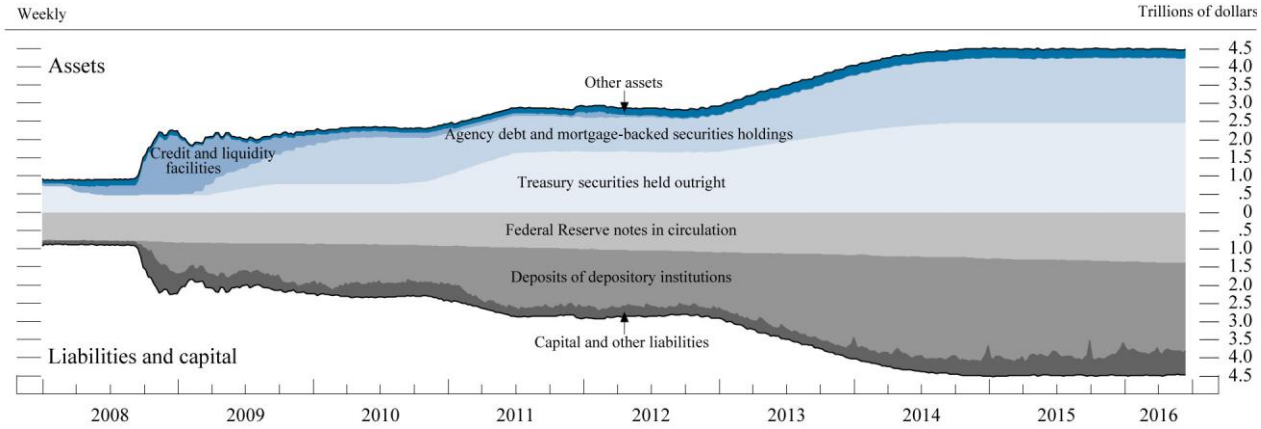

Fig. 2.10. Federal Reserve assets and liabilities.

Sourse: [Federal Reserve Board, Statistical Release, "Factors Affecting Reserve Balances".].

Interest income on the SOMA portfolio has continued to support substantial remittances to the U.S. Treasury Department. The Federal Reserve provided $117.1 billion of such distributions to the Treasury in 2015, which included a one-time transfer of $19.3 billion made in December 2015 to reduce aggregate Reserve Bank capital surplus to $10 billion, as required by the Fixing America's Surface Transportation Act, and a transfer of $24.8 billion during the first quarter of 2016. The Federal Reserve's remittances to the Treasury have totaled over $600 billion on a cumulative basis since 2008. Consistent with the FOMC's Policy Normalization Principles and Plans published on September 17, 2014, and augmented with additional operational information at the March 2015 FOMC meeting, the Federal Reserve continued to use interest paid on reserve balances and employ an overnight reverse repurchase agreement (ON RRP) facility to manage the federal funds rate, and the effective federal funds rate has remained in its target range. Specifically, the Board of Governors left the interest rate paid on required and excess reserve balances unchanged at ½ percent, while the FOMC continued to authorize daily ON RRP operations at an offering rate of ¼ percent. In addition, the Board of Governors took no action to change the discount rate (the primary credit rate), which remained at 1 percent [68].

The FOMC also continued to indicate that the Federal Reserve's daily ON RRP operations would be undertaken in amounts limited only by the value of Treasury

securities held outright in the SOMA that are available for such operations and by a per-counterparty limit of $30 billion per day. The total take-up at ON RRP operations with the Federal Reserve generally decreased in the first half of the year and remained at levels below those observed prior to the increase in the target range for the federal funds rate in December. The Committee has stated that it intends to phase out the ON RRP facility when it is no longer needed to help control the federal funds rate. The Federal Reserve also continued to test the operational readiness of other policy tools. In particular, two Term Deposit Facility operations were conducted in the first half of 2016; seven-day deposits were offered at both operations at a floating rate of 1 basis point over the interest rate on excess reserves. In these operations, term deposit volumes were broadly in line with those in previous tests with similar parameters. In addition, the Open Market Desk conducted several small–dollar value exercises solely for the purpose of maintaining operational readiness [62].

The median of participants' projections for the growth of real gross domestic product (GDP) was 2 percent for each year from 2016 through 2018, in line with the median estimate of the longer-run growth rate of real GDP. The median of growth projections in 2016 and 2017 was slightly lower than the median of near-term projections made at the time of the March FOMC meeting. The range of participants' projections for real GDP growth in 2017, 2018. The median of projections for the unemployment rate edges down from 4.7 percent at the end of 2016 to 4.6 percent in 2017 and 2018, modestly below the median assessment of the longer-run normal unemployment rate of 4.8 percent. The median of projections for inflation as measured by changes in the price index for personal consumption expenditures (PCE) in 2016 stands at 1.4 percent, a bit higher than in March; the median rises to 1.9 percent for 2017 and to the Committee's objective of 2 percent for 2018 and over the longer run. The medians of projections for core PCE inflation also rise gradually over the next two years. Wivth regard to particpants' projections of appropriate monetary policy, the median projection for the federal funds rate rises only gradually from ⅞ percent in 2016 to 1⅝ percvent at the end of 2017 and 2⅜ percent by the end of 2018, somewhat below the 3 percent median of participants' estimates of its longer-run normal level.

2.3. External financial flows and tax revenues for Africa

The estimated 208.3 billion USD of external finance – foreign investment, trade, aid, remittances and other sources that Africa attracted in 2015 – was 1.8% lower than the previous year. The total sum is projected to rise again to USD 226.5 billion in 2016. Falling commodity prices, particularly for oil and metals, were one of the key causes for the 2015 fall. Portfolio equity and commercial bank credit flows dried up, reflecting tightening global liquidity and a market sentiment wary of risks. Rising remittances and increased official development assistance largely kept the figure up. African governments have to stabilise financial inflows in the short term and use them for sustained economic diversification for the longer term. Falling resource revenues mean governments must also find ways to broaden the tax base away from oil and commodities. Flows of finance into Africa – foreign direct investment, portfolio equity and bonds, commercial bank, bilateral and multilateral bank credit, official development assistance and public domestic revenues – have remained broadly stable despite weak conditions in other parts of the world. Total external flows to Africa for 2015 were estimated at USD 208.3 billion, down from an estimated USD 212.2 billion in 2014. But the figure was predicted to pick up to USD 226.5 billion in 2016 [43; 44].

There are two starkly different numbers of crucial foreign direct investment (FDI). According to International Monetary Fund (IMF) (2015) estimates released in October 2015, foreign investment into Africa increased by 16% over the year. In contrast, the United Nations Conference on Trade and Development (UNCTAD) (2016) estimated a 31.4% drop (see Fig. 2.11) from 2015. Such a decline would suggest that total external finance decreased to USD 188.8 billion, a sharp 11% fall from 2014. Portfolio inflows dropped by 42%. Commercial bank credit also declined considerably in 2015, though the overall effect was minimal as it is a minor source of external finance in Africa. Remittances and official development assistance (ODA) played a key role in the overall figure. Remittances increased by 1.2% and ODA by 4.0%. Gross inflows of multilateral and bilateral official credit flows increased, but because of a heavy amortisation schedule in 2015, the net contribution to financial flows decreased 10% [43].

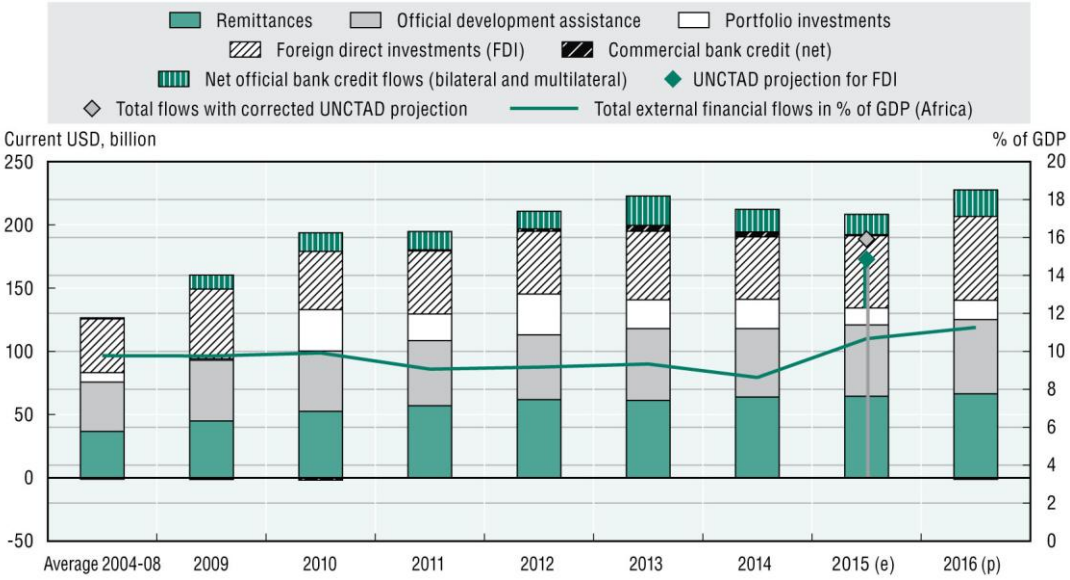

Fig. 2.11. External financial flows to Africa, average 2004-08, 2009-16, current USD billion and % of GDP.

Sourse: [http://dx.doi.org/10.1787/888933350091.].

Private financial flows to Africa increased from an average of USD 87 billion in 2004-08 to USD 129 billion in 2011 despite the downturn after the 2008-09 global financial crisis. However, since 2012 the private finance decreased from USD 146 billion to USD 136 billion in 2015. It is projected to increase by 8% in 2016 (see Table 2.4). Foreign direct investment into Africa grew steadily from 2007 to 2013. In 2014, however, FDI fell back to USD 49.4 billion, but increased to USD 57.5 billion in 2015, according to IMF (2015) estimates. Africa has attracted investment from industrialised countries such as France, the United Kingdom and the United States and emerging economies such as China, India, South Africa, and United Arab Emirates. Investment is still mainly directed at resource-rich countries, but non-resource-rich countries are becoming more attractive. The extractive sector, infrastructure and consumer-oriented industries are the main draws for investment.

The lower UNCTAD estimate for investment in Africa in 2015 reflects a sharp drop into Mozambique (-21%), Nigeria (-27%), and South Africa (-74%). If UNCTAD rather than IMF data were used, private finance to Africa would have dropped by 19.5% to USD 116 billion in 2015. Total financial flows would have decreased 12.8% to USD 188.8 billion. Portfolio flows decreased from USD 23 billion in 2014 to USD 13 billion in 2015. There was a net portfolio equity exit in the second half of 2015. Bond flows remained relatively stable. Compared to other

sources of foreign finance, net commercial bank credit is very small. Since 2014, net commercial bank credit flows fell from USD 3.8 billion in 2014 to USD 500 million in 2015 and are expected to further decrease in 2016. Remittances remain the most important single source of external finance with USD 64 billion in 2015 [36; 44].

Table 2.4

Financial flows and tax revenues to Africa, 2004-16, current USD billion.

			2004-08	2009	2010	2011	2012	2013	2014	2015e	2016
Foreign	**Private**	Inward foreign direct investments (FDI)	42.8	55.1	46.0	49.8	49.7	54.2	49.4	57.5	66.3
		Portfolio investments	7.5	1.2	32.7	21.0	32.3	22.8	23.1	13.4	15.2
		Remittances	36.7	44.9	52.5	57.0	61.9	61.2	63.8	64.6	66.4
		Commercial bank credit (net)	0.5	-1.3	-1.7	0.8	1.8	4.5	3.8	0.5	-1.2
	Public	Net official bank credit flows (bilateral and multilateral)	-1.0	11.0	14.8	14.5	14.0	23.3	17.8	16.0	21.0
		Official development assistance (net total, all donors)	39.0	48.0	47.7	51.5	51.1	56.7	54.2	56.4	58.7
		Total foreign flows	125.5	158.9	192.0	194.8	210.7	222.8	212.2	208.3	226.5
Domestic		Tax revenues	281.0	302.9	367.8	453.2	458.8	468.5	461.2		

Note: ODA estimates (e) and projections (p) are based on the real increase in country programmable aid (CPA) in OECD (2016). The forecast for remittances is based on the projected rate of world growth according to the World Bank.

Compared to volatile foreign investment and portfolio flows, remittances are considered more stable and may even be counter-cyclical in the face of external economic shocks (UNDP, 2011). While developed countries such as the United States, France and the United Kingdom dominate remittances to Africa, Arab states and money moving from Cameroon, Côte d'Ivoire and South Africa are also important. The World Bank predicts a slight increase in remittances for 2016 to USD 65.6 billion. But Europe's weak growth and the slump in oil prices for Gulf producers may affect remittances to Africa (see Table 2.4).

Official development assistance in grants and concessional loans increased in 2015, after a small drop in 2014. At USD 56 billion in 2015, ODA remains the most important source of public finance for Africa and is expected to increase by 4.1% in 2016. Net official bank credit from bilateral and multilateral stakeholders have decreased from USD 17.8 billion in 2014 to USD 16 billion in 2015 but is expected

to reach USD 21 billion in 2016. Important lenders for Africa's infrastructure investment are the People's Bank of China, the China Development Bank, and the Export-Import Bank of China. In addition to established lenders such as the World Bank, the African Development Bank and the European Investment Bank, the New Development Bank BRICS, founded in 2014, is expected to significantly contribute to Africa's campaign to reach the United Nations' Sustainable Development Goals by complementing existing public and private financial institutions. Overall, African countries' total domestic public revenues are down. This is mostly due to a fall in taxes on resource revenues. While countries with commodities have been confronted with a drop in tax-GDP ratios across all categories, non-resource-rich countries have increased tax revenues and tax-GDP ratios [2; 3].

Africa faces volatile FDI inflows. Foreign investment into Africa increased by 16% from to USD 57.5 billion in 2015, according to IMF figures. Flows to North Africa reversed a downward trend, as investment increased by 20% from USD 17.2 billion in 2014 to USD 20.7 billion in 2015. East Africa has seen higher FDI since 2010. In 2015, the figure rose 16% to USD 8.9 billion in 2015 from USD 7.7 billion the previous year. For West Africa investment rose from USD 9.3 billion to USD 9.7 billion. Central Africa saw a decline from USD 6.6 billion in 2014 to USD 5.4 billion. Southern Africa received USD 12.9 billion of FDI in 2015 against USD 8.7 billion in 2014, and USD 11.4 billion in 2013. The leading African investment destinations in 2015 were: Egypt (USD 10.2 billion), Mozambique (USD 4.7 billion), Morocco (USD 4.2 billion), South Africa (USD 3.6 billion), Ghana (USD 2.5. billion), the Democratic Republic of the Congo (USD 2.5 billion), Zambia (USD 2.4 billion), Tanzania (USD 2.3 billion), Ethiopia (USD 2.1 billion), Guinea (USD 1.9 billion), and Kenya (USD 1.9 billion). Africa has attracted foreign investment from many countries, notably from the United Kingdom, France, the United States, and from the emerging economies China, India, South Africa, and the United Arab Emirates (see Fig. 2.12).

Terrorist activity and deteriorating security in some Sahel countries and political instability are a threat to investment. External and domestic factors influence Africa's investment return, including economic slowdowns in emerging economies

and the weak recovery in the European Union. Declining oil and metals prices have led foreign investors to scale down operations in resource-rich countries. There is a positive side too. African manufacturing and services may benefit from increased inflows due to the stronger US dollar and China's yuan renminbi. Investment from the emerging economies in Africa's skills and infrastructure development can help to overcome the reliance on resource-driven FDI. Without Egypt, investment to North Africa would have dropped. FDI to Egypt increased from USD 5.5 billion in 2014 to USD 10.2 billion in 2015. United Arab Emirates investors have played an important role in Egypt's recovery. Flows into Morocco fell to USD 4.2 billion in 2015 from USD 4.7 billion in 2014. But Morocco became the third- largest recipient of foreign investment in Africa in 2015. European firms were leading investors in Morocco, which benefits from historic ties and proximity to Western Europe, as well as a proactive FDI policy and skilled workers who earn lower wages than in Europe. Investment into Tunisia has been seriously affected by political and economic turbulence since 2009. FDI has declined by more than 40% since 2012 to USD 1.1 billion in 2015. The precarious political and security situation in the Sahel is a risk for West and Central Africa [24].

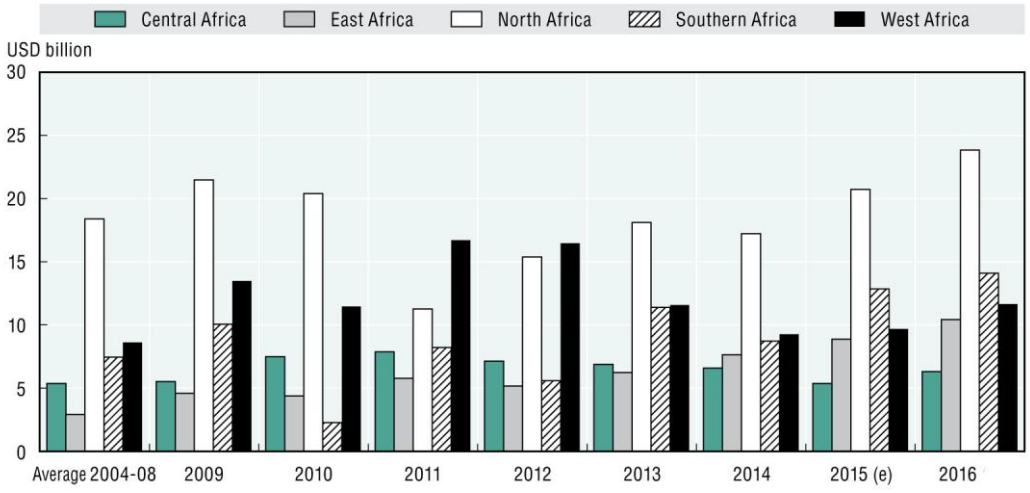

Fig. 2.12. Inward FDI by regions 2004-16, USD billion.

Sourse: [http://dx.doi.org/10.1787/888933350102.].

Investment in commodities has suffered. Nigeria has seen a sharp decrease in investment over the past five years from USD 8.1 billion in 2011 to USD 1.4 billion in 2015. Ghana attracted the biggest share of West African FDI (USD 2.5 billion), followed by Guinea (USD 1.9 billion), Côte d'Ivoire (USD 1.0 billion) and

Mauritania (USD 0.8 billion). Countries such as Liberia, Senegal, Sierra Leone, and Togo received less than USD 500 million each in 2015. In East Africa, Tanzania (USD 2.3 billion) and Uganda (USD 1.3 billion) received stable investments in 2015. Uganda's oil sector is expected to be the country's main investment magnet in future. Kenya's investment has risen from USD 500 million in 2013 to USD 1.9 billion in 2015. Ethiopia's has gone up from USD 1.2 billion in 2013 to USD 2.1 billion in 2015. Ethiopia's FDI is mainly in labour-intensive areas. Although the 32 projects launched there in 2015 accounted for only 4.4% of total investment in Africa, these made up 18.5% of the jobs from the FDI in Africa. Ethiopia has slowly been opening up to foreign investment in the manufacturing and retail sectors (fDi Markets, 2016). The Democratic Republic of the Congo received USD 2.5 billion in 2015 and the Republic of the Congo USD 1.5 billion, in each case half of the 2014 levels. South Africa remains a key foreign investment destination in Southern Africa but its USD 3.6 billion was down from USD 8.2 billion in 2013 and USD 4 billion in 2014. Mozambique – the biggest recipient of foreign investment to Southern Africa in 2015 – attracted USD 4.7 billion [41].

Resource-rich countries still get the most foreign investment, but countries with no major commodities to rely on are taking a larger share of FDI. Countries that are not resource-rich received an estimated 37% of Africa's FDI in 2015, compared to 30% in 2010 (see Fig. 2.13). In 2015, the FDI-to-GDP ratio for non-resource-rich countries stood at 4.4%, up from 3.8% in 2010. The ratio for resource-rich countries increased from 2.0 % to 2.5% from 2010 to 2015. Several countries without significant resources are attracting investors, including Kenya, Tanzania and Uganda, reflecting the shift towards consumer goods. Kenya is becoming an East African business hub for manufacturing, transport, services and information and communications technology (ICT). The Herfindahl-Hirschman index, a concentration ratio, indicates a shift to ICT, services, and manufacturing across Africa. The index went down from 0.43 in 2003 to 0.18 in 2014 and 0.14 in 2015. This trend is also confirmed by data on announced greenfield projects in 2015 which showed that services and manufacturing accounted for about 54% of the total value of projects in

Africa. Investment is starting to diversify into consumer-market oriented industries, including ICT, retail, food and financial services [55].

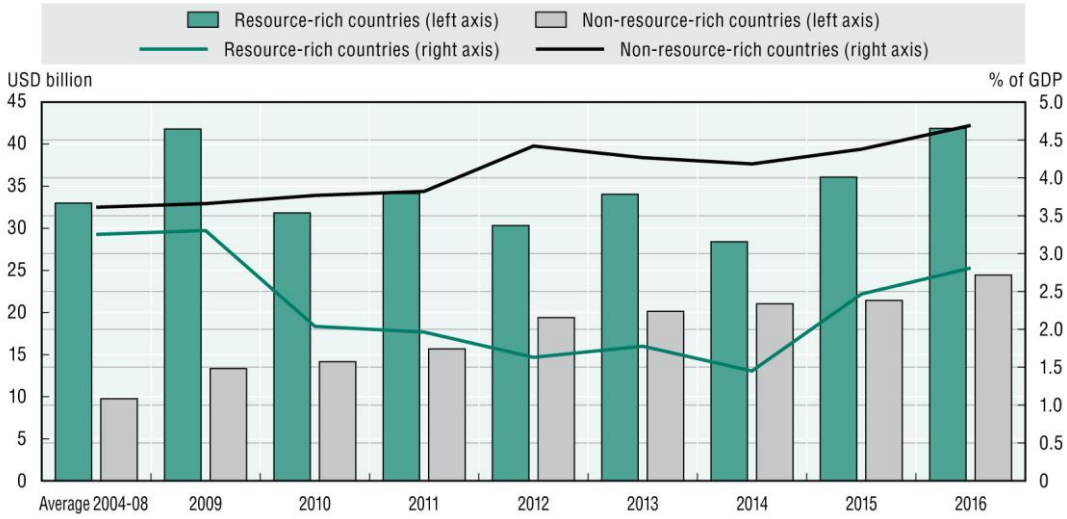

Fig. 2.13. Foreign direct investment to Africa: Resource-rich vs. non-resource-rich countries, 2000-16.

Sourse: [http://dx.doi.org/10.1787/888933350114.].

With urbanisation, African cities are growing consumer markets increasingly targeted by foreign investors. Disposable income and spending power in Africa's major cities will grow. Forecasts show that the GDP of major cities is increasing. The most important ones will be Cairo, Cape Town, Johannesburg, Lagos and Luanda. This ranking reflects the quality of the business climate, infrastructure and logistics, and availability of skilled workers. A recent surge in infrastructure investment indicates that states are investing in transport corridors to connect urban agglomerations and transform them into urban clusters. Examples include the Greater Ibadan-Lagos-Accra urban corridor, the Maputo Development Corridor, and the Northern Corridor between East and Central Africa. These investments will surge with deeper market integration through reduced transport and trade costs. They will also foster competition and productivity, which will make African hubs more attractive for foreign investors [55].

Portfolio inflows to Africa in 2015 were half the size of the period from 2012 to 2014. While bond issuances have remained resilient, portfolio equity inflows were reversed in the second half of 2015. Over the last decade, portfolio equity inflows to Africa have increased their share of total investment, with peaks in 2006 and 2012. A key development during the 2000s has been the increasing reliance of African

governments on markets for foreign and domestic debt financing. Compared to the emerging economies, portfolio flows to Africa's leading markets have been relatively resilient. According to the World Bank (2016a), global investors withdrew about USD 52 billion from emerging market equity and bond funds in the third quarter of 2015. During the 2008-09 global financial crisis, portfolio inflows fell sharply. Since 2010, by contrast, gross portfolio inflows to Africa have stayed positive. They peaked in 2010 and 2012, adding up to more than USD 32 billion each year. The ending of quantitative easing in the United States, oil market uncertainty and political risks have weighed on investor sentiment towards Africa recently, however. In 2015, gross portfolio inflows to Africa fell by USD 10 billion compared to 2013 and 2014, to USD 13.4 billion. For 2016, they are expected to stay flat. Gross portfolio outflows from Africa stayed at roughly USD 5 billion each year from 2013 to 2015. Consequently, Africa's net portfolio flows (inflows minus outflows) have remained positive since 2010. On balance, they have contributed net foreign savings to Africa worth USD 82 billion during 2010-15, or USD 13.7 billion annually on average.

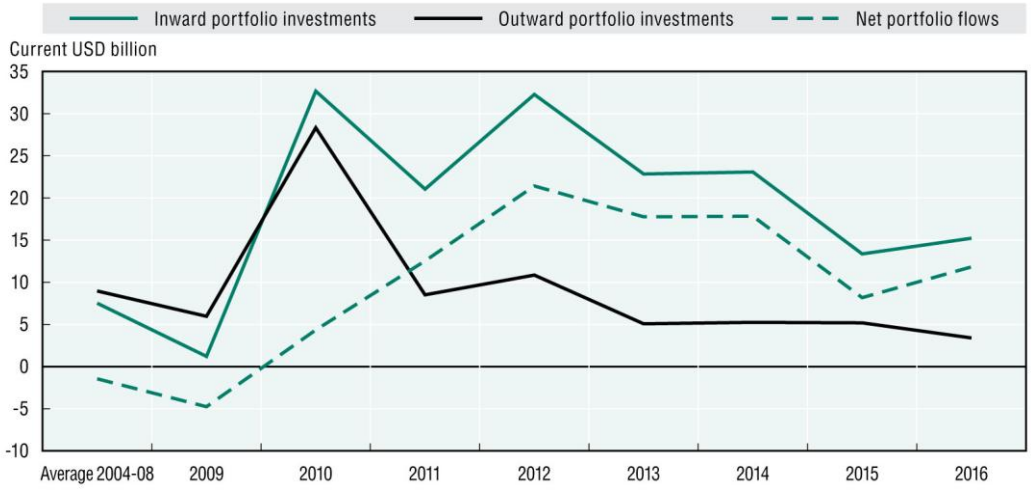

Fig. 2.14. Africa's inward and outward portfolio flows, 2004–16, USD billion.
Sourse: [http://dx.doi.org/10.1787/888933350134.].

Equity portfolio flows have been volatile over the past two decades. From a net equity outflow for 2009 they jumped to a net inflow in 2010 of almost USD 20 billion. Since then, they have levelled off, to a mere USD 1.2 billion for 2015. While equity flows can be an important form of participatory finance, they are not a reliable source of foreign finance. International public offerings (IPOs), by contrast, matter more for corporate finance in Africa. From 2010 to 2014, Africa has successfully

raised corporate capital through IPOs and further offers that exploited booming African stock markets. Volatile portfolio equity flows were reflected in most African equity markets that produced negative returns in the second half of 2015. Many observers see the US Federal Reserve's policy tightening as the culprit for the recent retrenchment. Domestic factors have also contributed to reduced investor demand for assets from emerging economies. Slower world growth added to investor concerns, particularly against the backdrop of the commodity price slump [60].

Bond issues rose substantially in sub-Saharan countries from 2011 to 2014. In 2011, there were USD 1 billion in bond issues. By the end of 2014 the figure was USD 6.2 billion. Some countries had benefited from debt relief programmes such as the Heavily Indebted Poor Countries initiative and the Multilateral Debt Relief Initiative. Up to mid-2014, steady global market conditions and the potential for higher returns for investors had paved the way for more access to international markets, where the average return for these bond issues is about 6.6%, with an average maturity of 10 years. In 2015, in the face of declining bank credit flows and net portfolio outflows, some countries continued to tap the international bond market to finance investment programmes. Côte d'Ivoire's sovereign bond issue in 2015 was followed by Gabon, Zambia, Ghana, Angola, and Cameroon. Angola and Cameroon issued maiden 10-year bonds. The six countries issued bonds worth USD 6 billion by the end of 2015. Eurobond issues by sub-Saharan countries with stronger economies (excluding South Africa) held up well in 2015. Bond issues in 2015 compare to annual volume at record levels in 2013 and 2014 when 12 countries, many of them debut issuers, placed bonds worth USD 12 billion in international capital markets. Bond spreads reflected the tough economy, the change in investor sentiment and rating changes, especially in the second half of 2015. While new issues went ahead, Africa's borrowers had to offer significantly higher yields, and yields on secondary markets jumped to multi-year highs. For Zambia and Côte d'Ivoire, primary market yields increased by 70 and 100 basis points respectively, and for Ghana, by 260 basis points to 10.8% in relation to the last issues in 2014. Angola, a new bond debt issuer, had to offer a yield of 9.5% [66].

Net bank credit flows to Africa concentrated overwhelmingly on official bank credit in 2015. Figure 2.7 reveals that, by contrast, private commercial banks sharply reduced their new lending. Commercial bank lending was particularly cut for North African borrowers. Gross commercial bank credit flows to Africa fell from USD 9.5 billion in 2014 to USD 3.8 billion in 2015. Allowing for amortisation, net commercial bank lending to the continent shrank from USD 3.8 billion in 2014 to just USD 500 million in 2015. Future commercial bank lending is projected to fall further in 2016 and 2017. Despite scheduled repayments contained at roughly USD 3 billion for 2016 and 2017, respectively, net commercial bank credit flows will likely subtract from rather than add to Africa's domestic savings. Net private bank credit flow is projected at a negative USD 1.16 billion in 2016 and USD 2.96 billion in 2017.

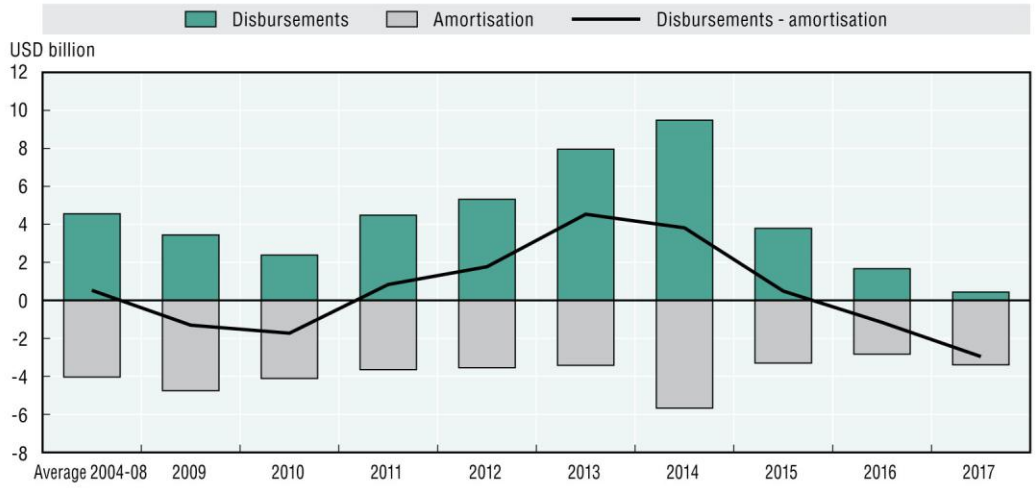

Fig. 2.15. Net commercial bank credit flows to Africa, 2004-17, USD billion.
Sourse: [http://dx.doi.org/10.1787/888933350158.].

Data on sources for bank credit to Africa is hard to find. The People's Bank of China, the China Development Bank, and the Export-Import Bank of China have supported largescale investment in African infrastructure but do not publish up-to-date information. For other bilateral and multilateral lenders, Economist Corporate Network (ECN) (2015) lists the World Bank, African Development Bank, Development Bank of Southern Africa, Export-Import Bank of the United States, African Export-Import Bank, European Investment Bank, Agence Française de Développement (AFD), Japan Bank for International Cooperation (JBIC), Islamic Development Bank and Kreditanstalt für Wiederaufbau (KfW) as the largest creditors. Official bank credit disbursements to Africa, from bilateral and multilateral

sources, have almost doubled since 2008 (see Fig. 2.16). Then, these sources provided USD 18.6 billion. By 2015, they had reached USD 34.7 billion and are projected to rise in 2016 to USD 39.5 billion [71].

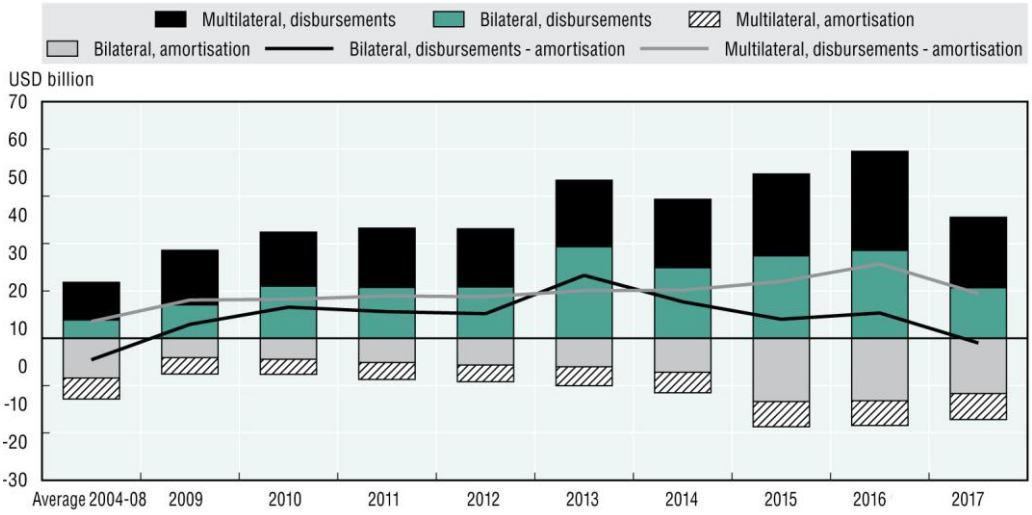

Fig. 2.16. Multilateral and bilateral official bank credit flows to Africa, 2004-17, USD billion.

Sourse: [http://dx.doi.org/10.1787/888933350165.].

Net official credit flows (disbursements minus amortisation) have declined in 2015, mainly due to a heavy amortisation schedule on bilateral liabilities. Payments to bilateral official creditors jumped to USD 13 billion in 2015 and are projected at that level for 2016, too. This compares to much lower payments for 2009–14 when amortisation to bilateral official creditors averaged USD 5.4 billion. Northern Africa has seen net official bank credit flows curtailed, as bilateral credit to the region turned negative from 2014, mostly as a result of Egypt's heavy amortisation schedule. The main bilateral borrowers in sub-Saharan Africa were Republic of the Congo and Côte d'Ivoire, mainly through agreements with China. While bilateral official lending accounted for 53.7% of total to Africa in 2013, it fell below multilateral lending in 2014. Multilateral development banks currently provide the most significant volume of bank credit resources to Africa. While net bilateral bank credit flows have dropped since 2014, the rise of net multilateral bank disbursements to sub-Saharan Africa has continued unabated. New gross multilateral disbursements for African borrowers have risen to record levels, USD 17.3 billion in 2015. Disbursements are projected to rise in 2016 to more than USD 21 billion, but the World Bank predicts they could drop sharply after [27].

Conclusions to chapter 2

Dollar credit has flowed since the global financial crisis to an unusual extent to emerging markets and to advanced economies that were not hit by it. Dollar credit has grown slowly in two economies where dollar credit was large and growing rapidly before the crisis, namely the euro area and the UK. In other words, since the crisis, dollar credit has grown fastest in the economies with relatively high domestic interest rates. Non-bank investors have extended an unusual share of dollar credit to non-US residents since the crisis. Such credit flowed through the international bond market to an unprecedented extent, while banks have stepped back as holders (and issuers) of bonds. Non-bank investors have not only bought all the net increase in bonds outstanding but taken up the bonds that have come out of bank portfolios. prior to the crisis, the familiar drivers of international bank credit played a predominant role in offshore US dollar credit growth.

The scale of dollar borrowing outside the US means that US monetary policy is transmitted directly to the rest of the world in several ways. Changes in the short-term policy rate are promptly reflected in the cost of $5 trillion in US dollar bank loans. Moreover, lower short-term dollar rates quicken the pace of the expansion of the stock of dollar loans extended to borrowers outside the US. In addition, unconventional monetary policy that reduces returns on Treasury bonds has also led bond investors to step up their extension of dollar credit to bond issuers outside the US and lowered dollar bond coupons for non-US issuers. These effects of large-scale bond buying on the amount and pricing of dollar bonds issued by non-US borrowers operates in addition to any effect such unconventional policy has in lowering the yields on bonds denominated in other currencies.

The ability of multinational firms to borrow dollars through offshore affiliates limits the effect of national policies to restrict access to or to raise the cost of dollar credit. Despite differences in capital account openness, policy in China and Korea succeeded in raising the cost of dollar bank credit from banks at home. However, faced with more expensive local dollar bank debt, emerging market firms can borrow dollars through offshore affiliates. Wider access to the global dollar bond market strengthens global forces and weakens national policies.

Mobilising domestic and foreign resources in the face of lower commodity prices and a rebalancing Policy questions arise about how governments of commodity exporting countries absorb the earnings shortfall in the short term. It is also important for Africa's governments to move in the longer term to diversify their economies to ensure sustainable benefit from financial flows and public revenues. A wide range of policies are possible for a great diversity of different countries. The main structural distinction runs between countries that are net exporters or importers of fossil fuels and industrial metals. The main financial distinction applies to the level of domestic savings, whether external debt is sustainable and the level of foreign-reserve buffers. A further distinction relates to the degree of exchange rate flexibility. Finally, the quality of domestic governance and institutions play a key role in how successful financial resources will be in helping to make growth inclusive and sustainable. Stabilising finance for development is a major short-term challenge. Reduced financial foreign flows require higher domestic tax revenues, more stimulus for foreign inflows and better use of foreign reserves.

CHAPTER 3. PROSPECTS FOR MONETARY POLICY IN TERMS OF THE DOLLAR EXPANSION DEVELOPMENT

3.1 Problems and controversies of monetary policy

Monetary policy was recruited to assist governments in stabilizing financial markets and restoring liquidity. And conventional assumptions about the primacy of central banks' responsibility for price stability were challenged as quantitative easing (QE) proved less inflationary than feared. Indeed, eight years after the crisis, the inflation rate – the most significant driver of monetary policy under the old regime – remains consistently low in most major economies. In this context, the United States faces some unique challenges. The dollar's status as the global reserve currency means that the US Federal Reserve's decisions often have international ramifications. Emerging markets are becoming more expovsed to spillovers from US policy, as globalization renders their economies and financial systems more interdependent and as finance becomes increasingly important relative to other ecoomic activity.

In Europe, the euro's problems reflect similar shortcomings to those that undermined the 1944 Bretton Woods system. Launched in 1999, the euro was in effect an attempt to maintain fixed exchange rates between member states. However, the single currency's designers underestimated the difficulty of maintaining such a system across multiple national economies, each with different growth profiles and fiscal policies. The euro's structural problems have been exacerbated by the secular shift from a world of politically 'subservient' central banks, as existed before the creation of the European Central Bank (ECB), to the current system in which the ECB is highly independent. Despite the current strains on the monetary system, consensus on a formalized new international framework in the mould of Brevtton Woods is unlikely. A more plauvsible outcome is the organic development of a new set of norms articulating principles both for the mechanims by which central banks pursue price stability and for the governance of central banks themselves. The United States and Europe are likely to be at the forefront of this process. They should proactively shape the new norms to ensure that they meet the challenges of today's evolving economic landscape [30].

The Fed has some obvious advantages in its conduct of monetary policy. The two policy-making bodies, the Board of Goverors and the Federal Open Market Committee (FOMC), are small and largely independent from other political institutions. These bodies can thus reach decisions quickly and implement them immediately. Their relative independence from the political process, together with the fact that they meet in secret, allows them to operate outside the glare of publicity that might otherwise be focused on bodies that wield such enormous power.

Lags. Perhaps the greatest obstacle facing the Fed, or any other central bank, is the problem of lags. It is easy enough to show a recessionary gap on a graph and then to show how monetary policy can shift aggregate demand and close the gap. In the real world, however, it may take several months before anyone even realizes that a particular macroeconomic problem is occurring. When monetary authorities become aware of a problem, they can act quickly to inject reserves into the system or to withdraw reserves from it. Once that is done, however, it may be a year or more before the action affects aggregate demand. Only after policy makers recognize there is a problem can they take action to deal with it. The delay between the time at which a problem is recognized and the time at which a policy to deal with it is enacted is called the implementation lag. For monetary policy changes, the implementation lag is quite short. The FOMC mveets eight times per year, and its members may confer between meetings through conference calls. Once the FOMC determines that a policy change is in order, the required open-market operations to buy or sell federal bonds can be put into effect immediately. Policy makers at the Fed still have to contend with the impact lag, the delay between the time a policy is enacted and the time that policy has its impact on the economy [30].

The impact lag for monetary policy occurs for several reasons. First, it takes some time for the deposit multiplier process to work itself out. The Fed can inject new reserves into the economy immediately, but the deposit expansion process of bank lending will need time to have its full effect on the money supply. Interest rates are affected immediately, but the money supply grows more slowly. Second, firms need some time to respond to the monetary policy with new investment spending—if they respond at all. Third, a monetary change is likely to affect the exchange rate, but

that translates into a change in net exports only after some delay. Thus, the shift in the aggregate demand curve due to initial changes in investment and in net exports occurs after some delay. Finally, the multiplier process of an expenditure change takes time to unfold. It is only as incomes start to rise that consumption spending picks up.

Choosing Targets. In attempting to manage the economy, on what macroeconomic variables should the Fed base its policies? It must have some target, or set of targets, that it wants to achieve. The failure of the economy to achieve one of the Fed's targets would then trigger a shift in monetary policy. The choice of a target, or set of targets, is a crucial one for monetary policy. Possible targets include interest rates, money growth rates, and the price level or expected changes in the price level.

Interest Rates. Interest rates, particularly the federal funds rate, played a key role in recent Fed policy. The FOMC does not decide to increase or decrease the money supply. Rather, it engages in operations to nudge the federal funds rate up or down. It had instructed the trading desk at the New York Federal Reserve Bank to conduct open-market operations in a way that would either maintain, increase, or ease the current "degree of pressure" on the reserve positions of banks. That degree of pressure was reflected by the federal funds rate; if existing reserves were less than the amount banks wanted to hold, then the bidding for the available supply would send the federal funds rate up. If reserves were plentiful, then the federal funds rate would tend to decline. When the Fed increased the degree of pressure on reserves, it sold bonds, thus reducing the supply of reserves and increasing the federal funds rate. The Fed decreased the degree of pressure on reserves by buying bonds, thus injecting new reserves into the system and reducing the federal funds rate. The current operating procedures of the Fed focus explicitly on interest rates. At each of its eight meetings during the year, the FOMC sets a specific target or target range for the federal funds rate. When the Fed lowers the target for the federal funds rate, it buys bonds. When it raises the target for the federal funds rate, it sells bonds.

Money Growth Rates. The Fed was required to announce to Congress at the beginning of each year its target for money growth that year and each report dutifully did so. At the same time, the Fed report would mention that its money growth targets

were benchmarks based on historical relationships rather than guides for policy. As soon as the legal requirement to report targets for money growth ended, the Fed stopped doing so. Since in recent years the Fed has placed more importance on the federal funds rate, it must adjust the money supply in order to move the federal funds rate to the level it desires. As a result, the money growth targets tended to fall by the wayside, even over the last decade in which they were being reported. Instead, as data on economic conditions unfolded, the Fed made, and continues to make, adjustments in order to affect the federal funds interest rate [19].

Price Level or Expected Changes in the Price Level. Some economists argue that the Fed's primary goal should be price stability. If so, an obvious possible target is the price level itself. The Fed could target a particular price level or a particular rate of change in the price level and adjust its policies accordingly. If, for example, the Fed sought an inflation rate of 2%, then it could shift to a contractionary policy whenever the rate rose above 2%. One difficulty with such a policy, of course, is that the Fed would be responding to past economic conditions with policies that are not likely to affect the economy for a year or more. Another difficulty is that inflation could be rising when the economy is experiencing a recessionary gap. The Fed was faced with a similar situation in the first half of 2008 when oil prices were again rising. If the Fed undertakes contractionary monetary policy at such times, then its efforts to reduce the inflation rate could worsen the recessionary gap. The solution proposed by Chairman Bernanke, who is an advocate of inflation rate targeting, is to focus not on the past rate of inflation or even the current rate of inflation, but on the expected rate of inflation, as revealed by various indicators, over the next year. This concept is discussed in the Case in Point essay that follows this section.

Political Pressures. The institutional relationship between the leaders of the Fed and the executive and legislative branches of the federal government is structured to provide for the Fed's independence. Members of the Board of Governors are appointed by the president, with confirmation by the Senate, but the 14-year terms of office provide a considerable degree of insulation from political pressure. A president exercises greater influence in the choice of the chairman of the Board of Governors; that appointment carries a four-year term. Neither the president nor Congress has any

direct say over the selection of the presidents of Federal Reserve district banks. They are chosen by their individual boards of directors with the approval of the Board of Governors [46].

The degree of independence that central banks around the world have varies. A central bank is considered to be more independent if it is insulated from the government by such factors as longer term appointments of its governors and fewer requirements to finance government budget deficits. Studies in the 1980s and early 1990s showed that, in general, greater central bank independence was associated with lower average inflation and that there was no systematic relationship between central bank independence and other indicators of economic performance, such as real GDP growth or unemployment. By the rankings used in those studies, the Fed was considered quite independent, second only to Switzerland and the German Bundesbank at the time. Perhaps as a result of such findings, a number of countries have granted greater independence to their central banks in the last decade. The charter for the European Central Bank, which began operations in 1998, was modeled on that of the German Bundesbank. Its charter states explicitly that its primary objective is to maintain price stability. Also, since 1998, central bank independence has increased in the United Kingdom, Canada, Japan, and New Zealand.

While the Fed is formally insulated from the political process, the men and women who serve on the Board of Governors and the FOMC are human beings. They are not immune to the pressures that can be placed on them by members of Congress and by the president. The chairman of the Board of Governors meets regularly with the president and the executive staff and also reports to and meets with congressional committees that deal with economic matters. The Fed was created by the Congress; its charter could be altered – or even revoked – by that same body. The Fed is in the somewhat paradoxical situation of having to cooperate with the legislative and executive branches in order to preserve its independence.

Geopolitical tensions and risks. Geopolitical tensions remain a major downside risk for the economic outlook. In addition to the severe human toll, the crises in Iraq, Libya, the Syrian Arab Republic and Ukraine have already had pronounced economic impacts at the national and subregional levels, although the global economic effect

has so far been relatively limited. A major reason for the limited global impact thus far is that global oil markets remained on an even footing, with any actual or feared conflict-related decline in oil supplies being offset by oil production increases, notably in the United States. Nevertheless, the world economy remains at risk to experience a more pronounced slowdown that could be caused by subregional economic weakness due to conflict and sanctions feeding into a broader global impact. A further risk lies in a drastic fall in oil output and exports by any of the major oil-exporting countries, which may set off a sharp adjustment in financial markets' risk perception, leading to higher risk premia and an increase in market volatility across different asset classes [47].

The crisis in Ukraine has led to several rounds of sanctions between the Russian Federation and leading OECD economies. Over the course of 2014, those countries have introduced a series of increasingly tough sanctions against the Russian economy, affecting the defence, finance and energy sectors by restricting exports of arms, double-use technology and certain equipment for the oil industry, and by curbing access of Russian banks and companies to international capital markets. The measures have already imposed a serious toll on the Russian economy through worsening business sentiment and an outflow of capital, and have triggered a reciprocal response. In August of 2014, the Government of the Russian Federation decided to impose counter-sanctions against those countries – most notably imposing a one-year ban on imports of their food products, despite the fact that switching to alternative suppliers may imply high transaction costs and lead to higher inflation, which currently poses a serious macroeconomic threat to the Russian economy.

Weaker Russian import demand has already affected a number of EU economies, as the Russian market absorbs almost 5 per cent of the euro area's exports. The slowdown in the German economy in the second quarter is partially explained by lower exports of automotive components to the Russian Federation. Moreover, the restriction on supplying deep-water drilling equipment to sanctioned Russian companies affected Germany's producers. Financial difficulties experienced by the sanctioned oil companies will limit their investment plans and, consequently, sales of construction materials to those companies. Some countries, such as the Baltic

States and Finland, will lose transit revenue. Globally, the tourism industry will suffer from the depreciation of the Russian currency.

The Russian ban on food imports, in turn, will mostly hurt those countries which are strongly exposed to trade with the Russian Federation, not only through direct losses by the agricultural sector, but also their consequential effects. Total EU food exports to the Russian market amount to approximately $11 billion annually. The forgone food exports would impact the entire logistics sector (including transport), put pressure on the states' budgets to compensate for farmers' losses, put banks exposed to agricultural borrowers at risk by increasing the number of non-performing loans, and constrain credit extended to farmers. For some East European countries (especially the Baltic States and Poland) and also for Finland and Norway, the Russian Federation absorbs a significant share of their food exports. For Poland, fruit and vegetable exports to the Russian Federation provided revenue of around $1 billion last year.

The loss of the Russian market may also have a multiplier effect on the region, through weaker aggregate demand in the affected countries, resulting from significant intraregional trade links. Although the EU members will be able to file a compensation claim with the EU, and the European Commission in late August announced support measures for dairy exporters and fruit and vegetable farmers, full coverage of losses is not likely. Nevertheless, at the macroeconomic level, the impact of the Russian food import ban still remains to be seen. By contrast, some countries, among them Argentina, Brazil, Serbia and Turkey, as well as some CIS economies, may benefit from the current situation, becoming alternative food product suppliers to the Russian Federation.

The conflict situations in Iraq, Libya and the Syrian Arab Republic have created considerable uncertainty in the oil market. In 2013, Iraq's oil production constituted 3.7 per cent of total world oil production, while Libya provided 1.1 per cent of global output. But despite the ongoing conflicts in these countries, crude oil prices actually declined, in contrast to similar episodes in the past that saw sharp increases in crude oil prices. This price behaviour is linked to the oil output trend in other oil producers, especially the United States. Oil production there jumped by 12.5

per cent in 2013, following an increase by 13.0 per cent in the previous year. The United States oil output level in 2013 came close to that of the Russian Federation, which was surpassed only by Saudi Arabia. Taken together, this has increased the resilience of the global oil market to any crisis scenarios. However, a major downside risk remains the possible sudden and drastic stoppage of exports by a major supplier country. While such a scenario could eventually be compensated for by existing slack in global oil markets, the immediate reaction of financial markets could be severe, with possible negative repercussions for real economic activity as well.

A further risk to the outlook lies in the future development of the Ebola epidemic. The current outbreak of the disease is the largest since the virus was first discovered in 1976, with the number of cases and deaths in this outbreak exceeding those of all previous outbreaks combined. The World Health Organization declared the outbreak an international public health emergency; in September, the United Nations Security Council declared the epidemic a threat to international peace and security. The first cases of the current outbreak were identified in March 2014 and the majority of cases have so far occurred in three West African countries, namely Guinea, Liberia and Sierra Leone. The occurrence of the outbreak and the difficulties in addressing it have been underpinned by the weak health systems in these countries, both in terms of human and physical resources. In addition to the severe human toll the disease has taken, it has also imposed major economic costs in the affected countries through disruptions to travel and trade [31].

Monetary policy stance. The direction of monetary policies has become more divergent among different economies in the world. While some countries are in a position to raise interest rates, others intend to reduce interest rates, reflecting a diverse economic situation and different country-specific challenges facing different economies. Major developed economy central banks continued to maintain accommodative monetary policy stances in 2016 against the backdrop of a weak recovery, deflationary pressures and limited support from the fiscal side. At its most recent meeting, the Fed decided to maintain the federal funds rate within the current range of 0.00–0.25 per cent for a “considerable time” after ending the asset-

purchasing programme, especially if projected inflation continues to run below 2.0 per cent and inflation expectations remain well anchored.

In forward guidance issued in July, the ECB announced that interest rates would remain at present or lower levels for an extended period of time for inflation in the medium-term, broad-based weakness in the real economy and weak monetary transmission. In September, in line with its forward guidance, the ECB kept the interest rates on refinancing operations, the marginal lending facility and the deposit facility unchanged at 0.05 per cent, 0.30 per cent and -0.20 per cent, respectively. The ECB will start buying covered bonds and asset-backed securities, which are expected to add 1.1 trillion euros to its balance sheet. The new round of asset purchases is expected to boost lending to SMEs, a priority sector for the ECB, to stimulate employment and growth in the euro area economies. At its meeting, the Bank of England (BoE) kept the policy rate unchanged at 0.5 per cent and the asset-purchasing programme at 375 billion pounds. In its first forward guidance in 2013, the BoE had signalled that it would leave interest rates unchanged at 0.5 per cent at least until the unemployment rate fell to 7.0 per cent. However, as unemployment fell below 7.0 per cent by 2016, the BoE maintained that there was still room for non-inflationary growth in the economy before it needed to raise interest rates and that the increases in interest rates are likely to be gradual and limited [31].

The BoJ continued its Quantitative and Qualitative Monetary Easing Programme, as inflation remained well below the 2 per cent target. On 2016, the BoJ announced that it will increase the monetary base at an annual pace of about 80 trillion yen and purchase Japanese government bonds at an annual rate of about 80 trillion yen, with an average remaining maturity of about seven years. The BoJ kept its policy rate below 0.10 per cent; it has remained at this level since 2009. In contrast to developed economies, developing- and emerging-economy central banks demonstrated considerable divergence in their monetary policy operations. The People’s Bank of China cut its benchmark interest rate in 2016, after previously reducing the short-term repo rate twice during 2016 in order to inject liquidity into the banking system. It also cut the reserve requirements for banks that lend to SMEs and rural sectors of the economy. On the other hand, the Central Bank of Brazil

increased its policy rate five times during 2014-2016 amid concerns about rising inflation. The central banks of India and South Africa raised interest rates during the first half of 2016, largely to stem capital outflows and prevent depreciation of their exchange rates, while the central bank of Indonesia has kept its policy rate unchanged at 7.5 per cent since November 2013 and the central bank of Turkey cut the policy rate by 50 basis points in 2016 [31].

Challenges in managing the normalization of monetary policy. Both the end of quantitative easing by the Fed in 2016 and the forthcoming normalization of its policy interest rate assumed in the baseline forecast hold significant risks and uncertainties for the economic outlook. These relate to the design of the exit strategy, its timing, and how it is perceived by financial markets. The potential difficulties that can arise in this context already became clear in the spring of 2013, when the announcement by the Fed of its intention to taper its bond purchases set off a fall in the price of various financial assets and a spike in financial market volatility. As the Fed has ended its quantitative easing (i.e., bond purchases), the focus has increasingly moved to the future trajectory of the policy interest rate. As outlined in the assumptions for the baseline forecast, the first interest-rate hike is expected in the third quarter of 2017, with further gradual increases bringing the policy rate to 2.75 per cent by the end of 2018. This projection is linked to the guidance given by the Fed that it will maintain the current near-zero level of interest rates for a considerable time after the end of the asset-purchasing programme, provided that inflation remains low.

The actual path of the policy interest rate will depend on a number of factors, particularly the emerging macroeconomic picture, in terms of unemployment and inflation, and concerns about financial stability risks. Interest rates will also be a major determinant not just of macroeconomic performance, but also the extent of financial stability risks and global spillovers. Policymakers face the challenge of determining the optimal magnitude and timing of interest-rate changes while dealing with a difficult trade-off: delaying the policy tightening could reinforce any asset mispricing and financial stability risks, while an unwarranted quick tightening could weaken the still fragile economic growth picture. The difficulty of designing the

optimal monetary policy path stems in large part from the uncertain nature of macroeconomic data. A case in point is the unemployment rate in the United States, which has fallen from a peak of 10 per cent in 2010 to below 6 per cent [31].

However, at the same time, the percentage of employees working part-time but preferring to work full-time remains elevated, indicating significant underemployment. In addition, the labour force participation rate has decreased, meaning that more people have simply stopped looking for a job. This raises two issues for monetary policymakers. First, there is the need to consider a broader unemployment variable that adjusts the nominal unemployment rate for involuntary part-time work and for the decrease in the labour-force participation rate. Second, if the drop in the participation rate is cyclical, monetary policy can be a potent means for reducing the participation gap by letting the unemployment rate fall below its long-term natural rate. This would help in bringing people back into the job market, which would have the side effect of reducing (to a point) any inflation pressure from the undershooting of the unemployment rate. However, an opposite argument can be made that a large part of the decline in the participation rate is actually structural, due, for example, to the ageing of the population;18 in this case, targeting the participation rate with monetary policy would be inadequate and create upward wage pressures and inflation.

3.2. Implications for monetary policy in terms of dollar expansion

Policy divergence remains a familiar theme today, but the focus has obviously shifted to the consequences of a tightening in U.S. monetary policy on the rest of the global economy. In my view, the Fed appears reasonably close to achieving both the inflation and employment components of its mandate. Accordingly, the case for removing accommodation gradually is quite strong, keeping in mind that the future is uncertain and that monetary policy is not on a preset course. By contrast, the major foreign economies--including the advanced foreign economies and many EMEs--are at a different state of their business cycle and likely to maintain a high level of accommodation for some time or even ease further. The knowledge is interpreted by many observers as illustrating how monetary tightening by the Federal Reserve can

exert a strong contractionary effect on our foreign trading partners through its effect on global financial conditions, just as the high level of Fed accommodation after the financial crisis provided a net boost to the global economy. Indeed, the large rise in U.S. bond yields during this episode precipitated a nearly commensurate rise in interest rates in many foreign economies and caused the prices of risky assets to fall globally. EMEs with weak fundamentals experienced sharp capital outflows, an abrupt tightening of financial conditions, and large exchange rate depreciations. The EME experience seemed reminiscent of past episodes of U.S. tightening--including in the 1980s and again in the mid-1990s--that had sizable adverse spillovers to EMEs, particularly in Latin America.

It is reasonably optimistic that the spillovers from ongoing U.S. normalization will be manageable for the foreign economies, including the EMEs. While there will almost inevitably be some bumps along the road, there are a number of reasons that policy normalization will not cause sizable disruptions for our trading partners:

1) The Fed will remove accommodation only in response to an outlook for improving economic conditions and firming inflation. The stronger U.S. economy and associated improvements in business and consumer confidence should support recoveries abroad through both trade and financial channels and lessen perceptions of downside risks to the global recovery.

2) Central banks in the advanced foreign economies--and in the EMEs with stronger fundamentals--should be able to mitigate an undesirable tightening of their own financial conditions through appropriate policy actions. An important lesson of the taper tantrum was that effective communications and actions by major central banks, including the European Central Bank and the Bank of England, helped quickly push bond yields back down to levels that these central banks regarded as appropriate to their economic situation. For example, the Bank of England's threshold strategy announced in the summer of 2013--promising to keep policy rates extraordinarily low at least until unemployment fell below 7 percent--lowered the expected path of policy rates significantly by pushing back expectations of liftoff.

3) Spillovers is that a number of EMEs have markedly improved fundamentals, even relative to several years ago. India is a good example. India was dubbed one of

the “Fragile Five” economies during the taper tantrum and, during that episode, experienced large capital outflows, a spike in borrowing costs, and sizable exchange rate depreciation. Since that time, India has markedly improved its macroeconomic framework, cutting its inflation rate by half to around 5 percent, anchoring inflation expectations more securely, and reducing what had been large and persistent fiscal and current account deficits. Somewhat more generally, the improved macroeconomic frameworks in many EMEs achieved over the past couple of decades with inflation targeting often playing a key role has enabled these economies to pursue countercyclical policies to a much greater degree than in the past and should help insulate them from monetary policy spillovers.

4) Spillovers could be mitigated is that U.S. policy rates are likely to increase only gradually assuming that economic developments unfold reasonably in line with expectations and to plateau at a significantly lower level than the historical average. The low long-run level of the policy rate reflects a number of factors including slower productivity growth, demographic change, and a higher demand for safe assets that have pushed down the real long-run neutral rate, which is the real interest rate needed to keep the economy at full employment in the longer-run. The upshot is that U.S. policy rates are likely to increase more slowly, and by a lower cumulative amount, than in past episodes of U.S. monetary tightening. This in turn should reduce the divergence between the stance of U.S. and foreign monetary policies and the associated spillovers arising from such divergence [30].

Overall, the dollar is in a secular decline, but it doesn't collapse, because:

- it is the dominant global medium of exchange;
- too many countries hold huge U.S. currency reserves;
- too many countries view the U.S. as their major export market and can't afford to let their currencies appreciate versus the dollar;
- too many countries have now major earnings generating direct investments in the U.S.

While there are good grounds to expect that spillovers from U.S. monetary policy actions will be manageable for most of our trading partners, events may unfold differently than expected. To illustrate, a noticeably faster U.S. recovery would

require a more rapid removal of U.S. accommodation and could exert noticeably larger spillovers abroad by putting more upward pressure on foreign interest rates and by inducing larger depreciations of foreign currencies. While such uncertainty is a constant feature of the landscape we confront as policymakers, both the U.S. and global economies will be served best if we keep our own houses in order and ensure that policy rates are adjusted as appropriate to achieve our inflation and employment objectives.

The costs of further delay in normalising policy will not be felt in the next year or two. The success of the Fed in anchoring inflation expectations serves as a shield. Given the long lags in the monetary policy process, even major mistakes at present are unlikely to have large destabilising effects on price stability in the next year or two. Short-sighted policies always shift costs into the future. The need for a somewhat accommodative policy cannot be used to defend the current non-systematic policy and excessive emphasis on short-term employment gains. First and foremost, the Fed should take a long view and return to a systematic policy approach that preserves and defends price stability. As Paul Volcker and Alan Greenspan kept reminding us over a generation while cleaning up the mess that short-sighted policies created before their chairmanships, this is best way monetary policy can contribute to enhancing growth and employment in the long run.

Flexible Inflation Targeting. Therefore, there is still strong analytical support for a central bank to have a strong, credible commitment to stabilize inflation in the long run by announcing an explicit, numerical inflation objective, but also to have the flexibility to pursue policies to stabilize output around its natural rate level in the short run. Although the support for the flexible inflation targeting framework is not weakened by the lessons from the financial crisis, they do suggest, however, that the details of how flexible inflation targeting is conducted and what flexibility means need to be rethought. We first look at two possible basic modifications to the flexible inflation targeting framework, the choice of the level of the inflation target and whether some form of price level targeting would produce better economic outcomes.

Level of the Inflation Target. Because the financial crisis has shown that the zero-lower-bound problem can be more serious than previously thought, there is a

question of whether the optimal level of the inflation rate for a central bank target would be higher than the typical value of around the 2% level. With a higher inflation target, the real interest rate can be driven down to lower levels in the face of adverse aggregate demand shocks. This argument suggests that inflation targets less than 2% might be undesirable. Some FOMC participants have expressed their desired level of the long-run inflation rate to be below 2% in the FOMC projections that come out four times a year, and the lessons of the financial crisis provide support for the higher 2% long-run inflation goal of many of the other FOMC participants.

A second consideration is that the benefits of a higher inflation target only accrue when the zero lower bound becomes a binding constraint. Although this has surely been a major problem in this recent episode, it must be remembered that episodes like this have not come very often. Indeed, we have not experienced a negative shock to the economy of this magnitude for over seventy years. If shocks of this magnitude are rare, then the benefits to a higher inflation target will not be very large because the benefits will only be available infrequently. On the other hand, the costs of higher inflation in terms from the distortions it produces in the economy are ongoing. Thus although they may not be that large in any given year, these costs add up and in present value terms far outweigh the intermittent benefits obtained from having the zero lower bound not be binding in periods like the current one.

Price Level Targeting. Although for countries the commitment to a strong nominal anchor for countries which have an independent monetary policy has taken the form of a target for inflation, an alternative is to target a price level path instead. A negative demand shock that results in a lower price level will require monetary policy to try to raise the price level back to its target path and this will mean that inflation will be expected to rise in the short run above the long-run inflation target embedded in the price-level target path. The rise in expected inflation will then lower the real interest rate, thereby stimulating aggregate demand and economic activity. Hence, a price-level target is an automatic stabilizer: a negative demand shock leads to stabilizing expectations that stabilize the economy. This mechanism is even more effective when the negative demand shock is so large that the zero lower bound on nominal interest rates becomes binding.

A price-level target requires that overshoots or undershoots of the target must be reversed and this could impart significantly more volatility to monetary policy and, with sticky prices, to the real economy in the short run. An additional problem with a pricelevel target is that it would be harder to communicate, particularly if it has an upward trend, which would be required if the optimal long-run inflation rate is positive in order to make deflations a less frequent occurrence and also the zero-lower-bound-constraint be less likely to bind. In this case, a price-level target would be a moving target and so harder to explain than an inflation target, which is always kept at a constant level [30].

The lesson from the financial crisis that the zero-lower-bound problem is more serious than was previously contemplated argues for larger benefits of a price-level target that may outweigh the costs. Although the communication challenges are serious, the potential benfits of price-level targeting suggest that central banks might look into how to effectively communicate a price-level target to the public. For example, the central bank could indicate that when it undershoots its inflation target for a period of time, as is occurring currently in many countries, it would be willing to tolerate a higher inflation rate in the short-run so that the average inflation rate over a longer horizon would meet the target objective.

Risk Management and Gradualism. The important role of nonlinearities in the economy arising from financial disruption suggests that policymakers will not only focus on the modal outcomes, as they would in a certainty equivalent world which is a feature of the linear-quadratic framework, but will also tailor their policies to cope with uncertainty and the possible existence of tail risks in which there is a low probability of extremely adverse outcomes. The first element of this approach is that monetary policy would act preemptively when financial disruptions occur. Specifically, monetary policy would focus on what I have referred to as macroeconomic risk that is, an increase in the probability that a financial disruption will cause significant deterioration in the real economy through the adverse feedback loop described earlier in which the financial disruption causes a worsening of conditions in the credit markets, which causes the economy to deteriorate further, causing a further worsening of conditions in the credit markets, and so on. Monetary

policy would aim at reducing macroeconomic risk by cutting interest rates to offset the negative effects of financial turmoil on aggregate economic activity. By so doing, monetary policy can reduce the likelihood that a financial disruption might set off an adverse feedback loop.

To achieve normal market functioning most effectively, monetary policy would have the characteristics of being timely, decisive, and flexible. First, timely action, which is preemptive, is particularly valuable when an episode of financial instability becomes sufficiently severe to threaten the core macroeconomic objectives of the central bank. In such circumstances, waiting too long to ease policy could result in further deterioration of the macroeconomy and might well increase the overall amount of easing that would eventually be required to restore the economy to health. When financial markets are working well, monetary policy can respond primarily to the incoming flow of economic data about production, employment, and inflation. When a financial disruption occurs, however, preemptive policy will focus on indicators of market liquidity, credit spreads, and other financial market measures that can provide information about sharp changes in the magnitude of tail risk to the macroeconomy.

Second, policymakers would be prepared for decisive action in response to financial disruptions. In such circumstances, the most likely outcome (the modal forecast) for the economy may be fairly benign, but there may be a significant risk of more severe adverse outcomes. In such circumstances, the central bank can take out insurance by easing the stance of policy further than if the distribution of probable outcomes were perceived as fairly symmetric around the modal forecast. Moreover, in such circumstances, the monetary policy authorities can argue that these policy actions do not imply a deterioration in the central bank's assessment of the most likely outcome for the economy, but rather as an appropriate form of risk management that reduces the risk of particularly adverse outcomes.

Third, policy flexibility is especially valuable throughout the evolution of a financial market disruption. During the onset of the episode, this flexibility may be evident from the decisive easing of policy that is intended to forestall the contractionary effects of the disruption and provide insurance against the downside

risks to the macroeconomy. However, it is important to recognize that in some instances financial markets can also turn around quickly, thereby reducing the drag on the economy as well as the degree of tail risk. The risk management approach outlined here is one that abandons the prescription of the linear-quadratic framework that optimal monetary policy would involve gradual changes in monetary policy. Instead aggressive actions by central banks to minimize macroeconomic risk would result in preemptive, large changes in monetary policy.

The Lean Versus Clean Debate. The lean versus clean debate initially focused on whether monetary policy should react to potential asset-price bubbles. In thinking about this debate, it is worth distinguishing between two different types of asset-price bubbles. We then see how this bears on the lean versus clean debate and then examine the case for different policies to respond to potential bubbles.

Two Types of Asset-Price Bubbles. Not all asset price bubbles are alike. Financial history and the financial crisis of 2007-2009 indicates that one type of bubble, which is best referred to as a credit-driven bubble, can be highly dangerous. With this type of bubble, there is the following typical chain of events: Because of either exuberant expectations about economic prospects or structural changes in financial markets, a credit boom begins, increasing the demand for some assets and thereby raising their prices. The rise in asset values, in turn, encourages further lending against these assets, increasing demand, and hence their prices, even more. This feedback loop can generate a bubble, and the bubble can cause credit standards to ease as lenders become less concerned about the ability of the borrowers to repay loans and instead rely on further appreciation of the asset to shield themselves from losses.

At some point, however, the bubble bursts. The collapse in asset prices then leads to a reversal of the feedback loop in which loans go sour, lenders cut back on credit supply, the demand for the assets declines further, and prices drop even more. The resulting loan losses and declines in asset prices erode the balance sheets at financial institutions, further diminishing credit and investment across a broad range of assets. The decline in lending depresses business and household spending, which weakens economic activity and increases macroeconomic risk in credit markets. In

the extreme, the interaction between asset prices and the health of financial institutions following the collapse of an asset price bubble can endanger the operation of the financial system as a whole. However, there is a second type of bubble that is far less dangerous, which can be referred to as an irrational exuberance bubble. This type of bubble is driven solely by overly optimistic expectations and poses much less risk to the financial system than credit-driven bubbles.

The Case for Leaning Versus Cleaning. We have learned from the recent crisis that the bursting of credit-driven bubbles not only can be extremely costly, but are very hard to clean up after. Furthermore bubbles of this type can occur even if there is price and output stability in the period leading up to them. Indeed, price and output stability might actually encourage credit-driven bubbles because it leads market participants to underestimate the amount of risk in the economy. The case for leaning against potential bubbles rather than cleaning up afterwards has therefore become much stronger. However, the distinction between the two types of bubbles, one which (credit-driven) is much more costly than the other, suggests that the lean versus clean debate may have been miscast. Rather than leaning against potential asset-price bubbles, which would include both credit-driven and irrational exuberance type bubbles, there is a much stronger case for leaning against credit bubbles which would involve leaning against creditdriven bubbles, but not irrational exuberance bubbles.

Macroprudential Policies. First it is important to recognize that the key principle for designing effective policies to lean against credit bubbles is whether they fix market failures. Credit extension necessarily involves risk taking. It is only when this risk taking is excessive because of market failures that credit bubbles are likely to develop. Recognizing that market failures are the problem, it is natural to look to prudential regulatory measures to constrain credit bubbles. Some of these regulatory measures are simply the usual elements of a well-functioning prudential regulatory and supervisory system. These elements include adequate disclosure and capital requirements, liquidity requirements, prompt corrective action, careful monitoring of an institution's risk-management procedures, close supervision of financial institutions to enforce compliance with regulations, and sufficient resources and accountability for supervisors. The standard measures mentioned above focus on

promoting the safety and soundness of individual firms and fall into the category of what is referred to as microprudential supervision.

However, even if individual firms are operating prudently, there still is a danger of excessive risk-taking because of the interactions between financial firms that promote externalities. An alternative regulatory approach, which deals with these interactions, focuses on what is happening in credit markets in the aggregate, referred to as macroprudential regulation and supervision. Macroprudential regulations can be used to dampen the interaction between asset price bubbles and credit provision. Some policies to address the risks to financial stability from asset price bubbles could be made a standard part of the regulatory system and would be operational at all times whether a bubble was in progress or not.

Dichotomy Between Monetary Policy and Financial Stability Policy. Another lesson learned from the financial crisis and the discussion above is that monetary policy and financial stability policy are intrinsically linked to each other and so the dichotomy between monetary and financial stability policy is a false one. As we have seen, monetary policy can affect financial stability, while macroprudential policies to promote financial stability will have an impact on monetary policy. If macroprudential policies are implemented to restrain a credit bubble, they will slow credit growth and will slow the growth of aggregate demand. In this case, monetary policy may need to be easier in order to offset weaker aggregate demand. Alternatively, if policy rates are kept low to stimulate the economy, as is true currently, there is a greater risk that a credit bubble might occur. This may require tighter macroprudential policies to ensure that a credit bubble does not get started. Coordination of monetary and macroprudential policies becomes of greater value when all three objectives of price stability, output stability and financial stability are to be pursued

Towards a New 'New' Monetary System. The financial crisis and subsequent recession have broken down significant norms both technical and political. Economic recovery has remained sluggish in the United States and especially the EU, and financial and geopolitical shocks, including the fallout from Britain's referendum on EU membership, may negatively affect growth prospects. Structural problems with

the eurozone, and with the dollar's role in the international monetary system, linger on. Compounding these problems is the open question of overall volatility, was the financial crisis an anomaly or a turning point. Eight years on, it remains unclear whether we will return to a 'great moderation' of stable growth rates and business cycles, or if increased volatility is the new normal. However if interest rates, which were the central tool of monetary policy during the 'great moderation', consistently remain near zero, the use of unconventional monetary policy will by necessity become the norm. This would have uncertain ramifications.

Other actors are becoming discontent with the status quo, in particular with the role of the United States at the centre of the global financial system. If the United States conducts monetary policy without sufficient regard to the rest of the world, this would play havoc with emerging markets in the future. As developing markets such as China gain more economic clout, the international monetary system will likely have to depend less on the US Federal Reserve – at the same time, the Federal Reserve will have to focus more on the effects of its policies beyond the United States. Already we have seen the 'BRIC' countries (Brazil, Russia, India, China) attempt to create new institutions for global economic governance where existing ones have failed. This will be significantly harder to do in the case of the dollar, but it is still a possibility.

Best practices for an uncertain world. A significant but often overlooked factor in the history of monetary policy is that the 'great moderation' was partially the result of a post-Bretton Woods system that was not centrally planned through any agreements or treaties, but that grew instead out of best practices and norms developed primarily by the US Federal Reserve, European central banks and the IMF. Just as the norms of Bretton Woods broke down, the norms of this system have also begun to break down, either due to technical limitations – the inability of existing monetary policy tools to promote growth – or due to popular discontent. This system will need to be updated, a process that implies a period of uncertainty in monetary policy. Barring a new Bretton Woods-style agreement, which seems highly unlikely, this new system will again take the form of best practices and norms.

In any new framework, the United States will likely have to take a less central role in global economic governance, instead becoming the largest stakeholder in an international system. We have seen the beginnings of this transition. The G20 acted as just such a forum during the financial crisis, ensuring standardization on macroprudential supervision through the creation of the FSB. Many of the new macroprudential powers given to central banks were the product of FSB policy development and advocacy. Although the G20 has become a major forum for global governance because of its inclusion of developing and nonWestern countries, much of the technical expertise remains with European and US policy-makers, who collectively represent six of the grouping's 20 members (United States, European Commission, Germany, France, United Kingdom, Ital). By presenting a unified front on the need for independent central banking in this forum, the United States and European nations will be able to ensure that best practices are maintained.

A new system will have to reform those areas of the old regime that have failed over the last eight years and defend and institutionalize those areas that, while successful, have become controversial. Most notably, the pre-existing consensus approach to monetary policy has been inadequate for dealing with crises when interest rates remain near the zero lower bound. New technical solutions such as QE will need to be formalized in the coming years and decades. There is also the challenge of how the US Federal Reserve, the Bank of England and the ECB can manage the greater supervisory requirements they have inherited while limiting the politicization of policy. A further question is how central banks should regard independence in a world in which their responsibilities are becoming more political, and in which discontent with the economic status quo is growing. Finally, while the Bretton Woods system collapsed over four decades ago, many of the causes of its failure linger in the current economic system. In particular, the system remains centred on the United States in a way that (a) requires the US economy to run a large current-account deficit, and (b) effectively leaves other countries at the whim of the Federal Reserve's policies.

In light of the history that this paper has reviewed, the author proposes several policy recommendations for the ECB and US Federal Reserve:

1. Policy-makers should avoid a focus on inflation to the exclusion of economic growth, as that will delegitimize independent central banking. This is particularly important for the ECB. Even within Europe, most countries have had a tradition of much looser monetary policy and politically 'subservient' central banks. Given the wide economic disparities between European nations, the economic hardship created by 'leaving growth on the table' in a country like Greece can lead to sustained political unrest. This suggests that the ECB's mandate may need to be reassessed.
2. The use of unorthodox monetary policy must be standardized and made to appear less ad hoc in nature. In the event that growth remains slower and less predictable than before, and that inflation also remains low, the problem of the zero lower bound will persist. Whether a form of QE, negative interest rates, 'helicopter money' or some other solution becomes the tool of choice for central banks in zero-lower-bound scenarios, these choices should be coordinated between the ECB and US Federal Reserve, and their legitimacy must be conveyed to the public in advance of their use. However, just as interest rate targeting developed organically over time, these new tools will also necessarily evolve in a decentralized way, until a basic system of norms becomes accepted.
3. The needs of countries vulnerable to fluctuations in the US dollar should be accounted for. This could be done either through a more concerted effort by the United States to take into account and mitigate their positions, or by decreased dependence on the dollar. The IMF may be able to provide smoother access to liquidity, possibly through enhanced use of SDRs. An expansion and formalization of central bank swap lines would also be beneficial. The Federal Reserve could officially acknowledge that its actions have repercussions for the global economy rather than just for the domestic US economy, and could offer guidance on how it might take these issues into account. This would undoubtedly prove politically difficult domestically, but as slowdowns in the rest of the world would also affect US economic growth, internationally minded policy options should be considered more proactively by the Fed.

4. If macroprudential supervision functions are being moved from government ministries to central banks, prudential regulation must be kept operationally separate from the implementation of monetary policy within each central bank. While certain areas of macroprudential supervision should be controlled by central banks, the United States and Europe should focus as much as possible on robust enforcement of financial regulation through government agencies that are more politically accountable, rather than move those functions to a central bank. This will limit the incentives for lobbying or politicization of central banks in response to decisions of a non-macroprudential nature.
5. The US Federal Reserve and the ECB should attempt to use their clout to encourage best practices in central banks elsewhere. Monetary policy and macroprudential regulation require cooperation between home-country and foreign regulators, and the large US and European markets and financial systems will give the Federal Reserve and ECB significant bargaining power. This will help to spread norms on issues such as central bank independence and the coherent use of unorthodox monetary policy. The role of international bodies such as the G20, the FSB and the IMF will also be key in maintaining best practices.

Global trends will ensure that the role of both the US Federal Reserve and the ECB will change significantly in the next several years. It is important that policy-makers are mindful of previous missteps and challenges in monetary policy. If the present moment does indeed represent the end of the 'great moderation', with central banks now needing to employ unorthodox monetary policy more regularly, it is very possible that the world will experience instability in monetary policy similar to that seen in the 1970s. However, more coordinated engagement on these issues between the Federal Reserve and the ECB should improve their chances of arriving at best practices and ensuring their legitimacy, independence and effectiveness in the years to come.

Conclusions to chapter 3

The recent financial crisis, however, does require some major rethinking about the details of this basic framework for monetary policy strategy. We now recognize that the financial sector play a very prominent role in the macro economy and makes it highly nonlinear at times. This requires that we abandon the linear-quadratic framework for thinking about how to conduct monetary policy when there is a financial disruption. There is now a stronger case for a risk management framework that factors in tail risks that can produce very adverse outcomes for the economy. There is a stonger case for monetary policy to lean against credit bubbles (but not asset-price bubbles per se), rather than just cleaning up after the bubble has burst. Using monetary policy to pursue financial stability goals is not an easy task, however, and research on how to monitor credit conditions so that it decisions to use monetary policy to restrict excessive risk are based on the correct information will be a high priority for research in the future. The financial crisis has made it clear that the interactions between the financial sector and the aggregate economy imply that monetary policy and financial stability policy are closely intertwined.

Despite the current strains on the monetary system, consensus on a formalized new international framework in the mould of Bretton Woods is unlikely. A more plausible outcome is the organic development of a new set of norms articulating principles both for the mechanisms by which central banks pursue price stability and for the governance of central banks themselves. The United States and Europe are likely to be at the forefront of this process. They should proactively shape the new norms to ensure that they meet the challenges of today's evolving economic landscape. The financial crisis and subsequent recession have broken down significant norms both technical and political. Economic recovery has remained sluggish in the United States and especially the EU, and financial and geopolitical shocks, including the fallout from Britain's referendum on EU membership, may negatively affect growth prospects. Structural problems with the eurozone, and with the dollar's role in the international monetary system, linger on.

Conventional monetary stimulus (i.e. with interest rates as its primary instrument) in the major economies has in effect been exhausted, as interest rates

have hit what is known as their ‘zero lower bound’. With policy interest rates near or at zero, the major central banks – the US Federal Reserve, the European Central Bank (ECB), the Bank of England and the Bank of Japan – have been forced to adopt unorthodox and controversial policies such as QE. More recent breaks with orthodoxy include the introduction of negative interest rates and consideration of ‘helicopter money’ policies – i.e. direct financial transfers to households by central banks. The inviolability of central bank independence is starting to be questioned. This is particularly relevant in Europe, where most central banks had historically been accountable to their governments, and where the ECB has attracted criticism from some quarters for supposedly exemplifying the EU’s ‘democratic deficit’. Inadequate system-wide supervision of the financial sector has been often cited as a cause of the financial crisis, central banks have been given significantly expanded powers of macroprudential supervision. In most advanced economies, these powers were previously vested in a separate regulator or not addressed explicitly at all. This potentially changes the role of central banks quite fundamentally: whereas the conduct of monetary policy is relatively disconnected from the businesses and individuals it affects, macroprudential supervision requires regulators to take a more hands-on approach, directly interacting with and (where necessary) sanctioning private banks. The dollar has been at the centre of the global monetary system since Bretton Woods, but globalization and freer capital flows have left emerging markets more exposed to shocks from US monetary policy.

CONCLUSIONS

In the master's thesis proposes a new solution to the problem of theoretical and methodological approaches to the monetary policy in terms of the dollar expansion. This enabled us to not only form conclusions on the effects and composition of its providing, but also offer ways of implications for monetary policy in terms of dollar expansion.

1). Identification strategy uncovers a strong and statistically significant positive (negative) effect of real depreciation (appreciation) on real per capita growth over five-year average periods. The effect is visible in developing countries and pegs, and is not significant or wrongly signed in advanced countries and floats, where our instruments are also weaker. On the other hand, the e¤ects appear to be approximately symmetric between appreciations and depreciations, although large depreciations appear to have a stronger impact than large appreciations on average. The effects are much larger than previous comparable results in the literature, which suggests that our identification leads to sharper results. The exchange rates does matter for growth in developing economies, but substantially less so in advanced ones.

2). When fiscal and monetary policymakers disagree in the current system, they can potentially choose policies with the intent of offsetting each other's actions. The Fed's responsibilities as the nation's central bank fall into four main categories: monetary policy, provision of emergency liquidity through the lender of last resort function, supervision of certain types of banks and other financial firms for safety and soundness, and provision of payment system services to financial firms and the government. The real rate is largely independent of the amount of money and credit over the longer run because it is determined by the interaction of saving and investment (or the demand for capital goods). The internationalization of capital markets means that for most developed countries the relevant interaction between saving and investment that determines the real interest rate is on a global basis. Economists have two explanations for this paradoxical behavior: they note that, in the short run, many economies have an elaborate system of contracts that makes it difficult in a short period for significant adjustments to take place in wages and prices

in response to a more rapid growth of money and credit and they note that expectations for one reason or another are slow to adjust to the longer-run consequences of major changes in monetary policy.

3). Modern exchange rate models emphasize financial-asset markets. Asset-approach models may be divided into monetary-approach models, assuming perfect substitutability of assets internationally, and portfoliobalance models, assuming imperfect substitutability. Portfolio-balance models of exchange rate determination add relative asset supplies as a determinant. Central-bank sterilization occurs when domestic credit is changed to offset international reserve flows. Since balance-of-trade flows are balanced by financial-asset flows, changes in the trade balance have a role in asset-approach views of exchange rate determination. If financial-asset markets clear fast relative to goods markets, then the exchange rate may overshoot the new long-run equilibrium after some shock to the system. International currency substitution will add an additional source of exchange rate variability. A high degree of currency substitution breeds currency union. Exchange rates are difficult to forecast because the market is continually reacting to unexpected events or news. Even in the absence of any major news, exchange rates adjust through the day as foreign exchange dealers manage their inventories and respond to trades with others who may be better informed.

4). Dollar credit has flowed since the global financial crisis to an unusual extent to emerging markets and to advanced economies that were not hit by it. Dollar credit has grown slowly in two economies where dollar credit was large and growing rapidly before the crisis, namely the euro area and the UK. In other words, since the crisis, dollar credit has grown fastest in the economies with relatively high domestic interest rates. Non-bank investors have extended an unusual share of dollar credit to non-US residents since the crisis. Such credit flowed through the international bond market to an unprecedented extent, while banks have stepped back as holders (and issuers) of bonds. Non-bank investors have not only bought all the net increase in bonds outstanding but taken up the bonds that have come out of bank portfolios. prior to the crisis, the familiar drivers of international bank credit played a predominant role in offshore US dollar credit growth.

5). The scale of dollar borrowing outside the US means that US monetary policy is transmitted directly to the rest of the world in several ways. Changes in the short-term policy rate are promptly reflected in the cost of $5 trillion in US dollar bank loans. Moreover, lower short-term dollar rates quicken the pace of the expansion of the stock of dollar loans extended to borrowers outside the US. In addition, unconventional monetary policy that reduces returns on Treasury bonds has also led bond investors to step up their extension of dollar credit to bond issuers outside the US and lowered dollar bond coupons for non-US issuers. These effects of large-scale bond buying on the amount and pricing of dollar bonds issued by non-US borrowers operates in addition to any effect such unconventional policy has in lowering the yields on bonds denominated in other currencies.

6). The ability of multinational firms to borrow dollars through offshore affiliates limits the effect of national policies to restrict access to or to raise the cost of dollar credit. Despite differences in capital account openness, policy in China and Korea succeeded in raising the cost of dollar bank credit from banks at home. However, faced with more expensive local dollar bank debt, emerging market firms can borrow dollars through offshore affiliates. Wider access to the global dollar bond market strengthens global forces and weakens national policies.

7). Mobilising domestic and foreign resources in the face of lower commodity prices and a rebalancing Policy questions arise about how governments of commodity exporting countries absorb the earnings shortfall in the short term. It is also important for Africa's governments to move in the longer term to diversify their economies to ensure sustainable benefit from financial flows and public revenues. A wide range of policies are possible for a great diversity of different countries. The main structural distinction runs between countries that are net exporters or importers of fossil fuels and industrial metals. The main financial distinction applies to the level of domestic savings, whether external debt is sustainable and the level of foreign-reserve buffers. A further distinction relates to the degree of exchange rate flexibility. Finally, the quality of domestic governance and institutions play a key role in how successful financial resources will be in helping to make growth inclusive and sustainable. Stabilising finance for development is a major short-term challenge. Reduced

financial foreign flows require higher domestic tax revenues, more stimulus for foreign inflows and better use of foreign reserves.

8). The recent financial crisis, however, does require some major rethinking about the details of this basic framework for monetary policy strategy. We now recognize that the financial sector play a very prominent role in the macro economy and makes it highly nonlinear at times. This requires that we abandon the linear-quadratic framework for thinking about how to conduct monetary policy when there is a financial disruption. There is now a stronger case for a risk management framework that factors in tail risks that can produce very adverse outcomes for the economy. There is a stonger case for monetary policy to lean against credit bubbles (but not asset-price bubbles per se), rather than just cleaning up after the bubble has burst. Using monetary policy to pursue financial stability goals is not an easy task, however, and research on how to monitor credit conditions so that it decisions to use monetary policy to restrict excessive risk are based on the correct information will be a high priority for research in the future. The financial crisis has made it clear that the interactions between the financial sector and the aggregate economy imply that monetary policy and financial stability policy are closely intertwined.

9). Despite the current strains on the monetary system, consensus on a formalized new international framework in the mould of Bretton Woods is unlikely. A more plausible outcome is the organic development of a new set of norms articulating principles both for the mechanisms by which central banks pursue price stability and for the governance of central banks themselves. The United States and Europe are likely to be at the forefront of this process. They should proactively shape the new norms to ensure that they meet the challenges of today's evolving economic landscape. The financial crisis and subsequent recession have broken down significant norms both technical and political. Economic recovery has remained sluggish in the United States and especially the EU, and financial and geopolitical shocks, including the fallout from Britain's referendum on EU membership, may negatively affect growth prospects. Structural problems with the eurozone, and with the dollar's role in the international monetary system, linger on.

10). Conventional monetary stimulus (i.e. with interest rates as its primary instrument) in the major economies has in effect been exhausted, as interest rates have hit what is known as their ‘zero lower bound’. With policy interest rates near or at zero, the major central banks – the US Federal Reserve, the European Central Bank (ECB), the Bank of England and the Bank of Japan – have been forced to adopt unorthodox and controversial policies such as QE. More recent breaks with orthodoxy include the introduction of negative interest rates and consideration of ‘helicopter money’ policies – i.e. direct financial transfers to households by central banks. The inviolability of central bank independence is starting to be questioned. This is particularly relevant in Europe, where most central banks had historically been accountable to their governments, and where the ECB has attracted criticism from some quarters for supposedly exemplifying the EU’s ‘democratic deficit’. Inadequate system-wide supervision of the financial sector has been often cited as a cause of the financial crisis, central banks have been given significantly expanded powers of macroprudential supervision. In most advanced economies, these powers were previously vested in a separate regulator or not addressed explicitly at all. This potentially changes the role of central banks quite fundamentally: whereas the conduct of monetary policy is relatively disconnected from the businesses and individuals it affects, macroprudential supervision requires regulators to take a more hands-on approach, directly interacting with and (where necessary) sanctioning private banks. The dollar has been at the centre of the global monetary system since Bretton Woods, but globalization and freer capital flows have left emerging markets more exposed to shocks from US monetary policy.

LITERATURE

1. Adrian T. Money, Liquidity and Monetary Policy / T. Adrian, H. Shin. // American Economic Review. – 2009. – №99/2. – C. 600–605.
2. Afeikhena Jerome Infrastructure for Economic Development and Poverty Reduction in Africa / Jerome Afeikhena // UN-HABITAT. – 2011. – 98 p.
3. African Economic Outlook 2015: Regional Development and Spatial Inclusion [Електронний ресурс] // OECD Publishing, Paris. – 2015. – Режим доступу до ресурсу: http://dx.doi.org/10.1787/aeo-2015-en.
4. Agenda 2063: The Africa We Want [Електронний ресурс] // African Union Commission, Addis Ababa. – 2015. – Режим доступу до ресурсу: http://agenda2063.au.int.
5. Avdjiev S. The euro area crisis and cross-border bank lending to emerging markets / S. Avdjiev, Z. Kuti, E. Takáts. // BIS Quarterly Review. – 2012. – C. 37–47.
6. Avdjiev S. Rapid credit growth and international credit: challenges for Asia / S. Avdjiev, R. McCauley, P. McGuire. // Exchange rate appreciation, capital flows and excess liquidity: adjustment and effectiveness of policy responses. – 2012. – The SEACEN Center. – C. 215–244. – Режим доступу до ресурсу: http://www.seacen.org/GUI/pdf/publications/research_proj/2012/rp87/capital-chap6.pdf.
7. Bauer M. International channels of the Fed's unconventional monetary policy / M. Bauer, C. Neely. // Journal of International Money and Finance. – 2014. – №44. – C. 24–46.
8. Bernanke B. Long-term interest rates / Bernanke. // Federal Reserve Bank of San Francisco, San FranciscoFederal Reserve Bank of San Francisco, San Francisco. – 2013. – №1.
9. Bernanke B. Federal Reserve Policy in an International Context [Електронний ресурс] / Ben Bernanke // Mundell-Fleming lecture presented at the 16th Jacques Polak Annual Research Conference, International Monetary Fund, Washington. – 2015. – Режим доступу до ресурсу: www.imf.org/external/np/res/seminars/2015/arc/pdf/Bernanke.pdf.

10. Bernanke B. Monetary Policy and the Housing Bubble [Електронний ресурс] / Ben Bernanke // American Economic Association, Atlanta Georgia. – 2010. – Режим доступу до ресурсу: http://www.federalreserve.gov/newsevents/speech/bernanke20100103a.htm.
11. Borio C. Capital Regulation, Risk-Taking and Monetary Policy: A Missing Link in the Transmission Mechanism? / C. Borio, H. Zhu. // BIS Working Papers. – 2008. – №268.
12. Borio C. Global credit and domestic credit booms / C. Borio, R. McCauley, P. McGuire. // BIS Quarterly Review. – 2011. – №9. – С. 43–57.
13. Brahima C. Monetary Policy in Emerging Market Economies: What Lessons from the Global Financial Crisis? [Електронний ресурс] / Coulibaly Brahima // International Finance Discussion Papers 1042. Washington: Board of Governors of the Federal Reserve System. – 2012. – Режим доступу до ресурсу: www.federalreserve.gov/pubs/ifdp/2012/1042/ifdp1042.pdf.
14. Brzoza-Brzezina M. Substitution between domestic and foreign currency loans in Central Europe: do central banks matter? / M. Brzoza-Brzezina, T. Chmielewski, J. Niedźwiedzińska. // ECB Working Paper Series. – 2010. – №1187.
15. Cho Y. Liberalising the capital account without losing balance: lessons from Korea / Y. Cho, R. McCauley. // China's capital account liberalisation: international perspectives, BIS Papers. – 2003. – №15. – С. 75–92.
16. Chui M. Risks related to EME corporate balance sheets: the role of leverage and currency mismatchRisks related to EME corporate balance sheets: the role of leverage and currency mismatch / M. Chui, I. Fender, V. Sushko. // BIS Quarterly Review. – 2014. – №9. – С. 35–47.
17. Colla A. Liquidity and leverage / A. Colla, H. Shin. // Journal of Financial Intermediation. – vol 19(3). – 2010. – С. 418–437.
18. Colla A. Non-financial corporations from emerging market economies and capital flows / A. Colla, H. Shin. // BIS Quarterly Review. – December. – 2014. – С. 67–77.

19. Colla A. Which financial frictions? Parsing the evidence from the financial crisis of 2007-9 / A. Colla, H. Shin. // NBER Macroeconomics Annual. – 2013. – С. 159–214.
20. D'Amico S. Flow and stock effects of large-scale Treasury purchases: evidence on the importance of local supply / S. D'Amico, T. King. // Journal of Financial Economics. – 2013. – №108/2. – С. 425–448.
21. Daniels J. International Business: Environments and Operations, 10th edn / J. Daniels, L. Radebaugh, D. Sullivan // New Jersey, Pearson Education. – 2007.
22. Domanski D. Assessing global liquidity / D. Domanski, P. McGuire, I. Fender. // BIS Quarterly Review. – 2011. – №12. – С. 57–71.
23. Douglas I. A. The French Gold Sink and the Great Deflation of 1929-32 / Irwin A. Douglas. // Cato Papers on Public Policy, Washington: Cato Institute. – 2012.
24. EY's Attractiveness Survey: Africa 2014: Executing Growth [Електронний ресурс] // Ernst & Young, London. – 2014. – Режим доступу до ресурсу: www.ey.com/Publication/vwLUAssets/EY-attractiveness-africa-2014/$FILE/EY-attractivenessafrica-2014.pdf.
25. Exploring the dynamics of global liquidity / S.Chen, P. Liu, A. Maechler, C. Marsh. // IMF Working Paper. – 2012. – №12/246.
26. FDI Markets [Електронний ресурс] // fDi Markets (database). – 2015. – Режим доступу до ресурсу: www.fdimarkets.com.trends-in-africa-2013-report-28641.
27. Feroli M. Market tantrums and monetary policy / M. Feroli, A. Kashyap, K. Schoenholtz. // Monetary Policy Forum. – 2014. – No 2014 US.
28. Forbes K. Capital flow waves: surges, stops, flight, and retrenchment / K. Forbes, F. Warnock. // Journal of International Economics. – 2012. – №88/2. – С. 235–251.
29. Fratzscher M. On the international spillovers of US quantitative easing / M. Fratzscher, M. Lo Duca, R. Straub. // ECB Working Paper Series. – 2013. – №1557/6.

30. Global Economic Prospects [Електронний ресурс] // World Bank, Washington, DC. – 2016. – Режим доступу до ресурсу: www.worldbank.org/en/publication/global-economic-prospects.
31. Global Investment Trends Monitor [Електронний ресурс] // United Nations Conference on Trade and Development, Geneva. – 2016. – Режим доступу до ресурсу: http://unctad.org/en/PublicationsLibrary/webdiaeia2016d1_en.pdf.
32. 2015 Global Outlook on Aid [Електронний ресурс] // OECD Publishing, Paris. – 2015. – Режим доступу до ресурсу: www.oecd.org/dac/aidarchitecture/2015%20FSS%20Survey%20flyer.pdf.
33. Global liquidity through the lens of monetary aggregates / K.Chung, J. Lee, E. Loukoianova, H. Park. // Economic Policy. – 2015. – №14. – С. 14–19.
34. Goldberg L. The international role of the dollar: does it matter if this changes? / Goldberg. // Global interdependence, de-coupling, and re-coupling, Cambridge. – 2013. – Westermann and Y-W Cheung.
35. Gruber J. The Dollar in the U.S. International Transactions (USIT) Model [Електронний ресурс] / J. Gruber, A. McCallum, R. Vigfusson // IFDP Notes. Washington: Board of Governors of the Federal Reserve System. – 2016. – Режим доступу до ресурсу: www.federalreserve.gov/econresdata/notes/ifdp-notes/2016/the-dollar-in-the-us-international-transactions-model-20160208.html.
36. Gruić B. Recent changes in global credit intermediation and potential risks / B. Gruić, M. Hattori, H. Shin. // BIS Quarterly Review. – 2014. – №9. – С. 17–18.
37. Hahm J. Monetary aggregates and procyclicality of the financial system: an Asian perspective / J. Hahm, H. Shin, K. Shin. // ADB-FSS conference. – 2013. – №2/6.
38. Hills B. Cross-border bank credit and global financial stability / B. Hills, G. Hoggarth. // Bank of England Quarterly Bulletin. – 2013. – №53/2. – С. 126–136.
39. Hofmann B. Taylor rules and monetary policy: a global ‘Great Deviation’? / B. Hofmann, B. Bogdanova. // BIS Quarterly Review. – 2012. – №9. – С. 37–49.

40. Hördahl P. Inflation risk premia in the euro area and the United States / P. Hördahl, O. Tristani. // International Journal of Central Banking. – 2014. – №10/3. – С. 1–47.
41. Infrastructure Financing Trends in Africa – 2014 [Електронний ресурс] // Infrastructure Consortium for Africa, Abidjan. – 2016. – Режим доступу до ресурсу: www.icafrica.org/en/news-events/ica-news/article/infrastructure-financing-trendsin-africa-2014-274982.
42. International Monetary Fund. World Economic Outlook: Subdued Demand: Symptoms and Remedies [Електронний ресурс] / International Monetary Fund // Washington: IMF. – 2016. – Режим доступу до ресурсу: www.imf.org/external/pubs/ft/weo/2016/02.
43. International Spillovers of Monetary Policy [Електронний ресурс] / J.Ammer, M. De Pooter, C. Erceg, S. Kamin // IFDP Notes. Washington: Board of Governors of the Federal Reserve System. – 2016. – Режим доступу до ресурсу: www.federalreserve.gov/econresdata/notes/ifdp-notes/2016/international-spillovers-of-monetary-policy-20160208.html.
44. IPO Watch Africa 2014 [Електронний ресурс] // Price Waterhouse Cooper. – 2015. – Режим доступу до ресурсу: http://www.pwc.co.za/en/assets/pdf/ipo-watch-africa-2014.pdf.
45. Ivashina V. Dollar funding and the lending behavior of global banks / V. Ivashina, D. Scharfstein, J. Stein. // NBER Working Papers. – 2012. – №2012. – С. 74.
46. Judson R. Crisis and calm: demand for U.S. currency at home and abroad from the fall of the Berlin Wall to 2011 / Judson. // IFD Papers. – 2012. – №1058.
47. Kaushik B. From Tapering to Tightening: The Impact of the Fed's Exit on India / B. Kaushik, B. Eichengreen, P. Gupta. // Policy Research Working Paper. Washington: World Bank Group. – 2014.
48. Kim C. Macroprudential policies: Korea's experiences / Kim. // Rethinking macro policy II: first steps and early lessons, Washington. – 2013. – №4. – С. 16–17.

49. Krishnamurthy A. The effects of quantitative easing on interest rates: channels and implications for policy / A. Krishnamurthy, A. Vissing-Jorgensen. // Brookings Papers on Economic Activity. – 2011. – №2. – С. 215–287.
50. Lane P. Domestic credit growth and international capital flows / P. Lane, P. McQuade. // Scandinavian Journal of Economics. – 2014. – №116. – С. 218–252.
51. Levy Yeyati E. Financial dollarization: evaluating the consequences / Levy Yeyati. // Economic Policy. – 2006. – №21. – С. 61–118.
52. Lo Duca M. Global corporate bond issuance: what role for US quantitative easing? / M. Lo Duca, G. Nicoletti, A. Martinez. // ECB Working Paper Series. – 2014. – №1649.
53. Macroeconomic conditions and capital raising / I.Erel, B. Julio, W. Kim, W. Weisbach. // The Review of Financial Studies. – 2012. – №25/2. – С. 341–376.
54. Marcel F. On the International Spillovers of U.S. Quantitative Easing [Електронний ресурс] / F. Marcel, M. Lo Duca, R. Straub // Working Paper Series 1557. Frankfurt: European Central Bank. – 2013. – Режим доступу до ресурсу: www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1557.pdf.
55. Masetti O. African Eurobonds: Will the Boom Continue? [Електронний ресурс] / O. Masetti // Deutsche Bank Research, Research Briefing. – 2015. – Режим доступу до ресурсу: http://tinyurl.com/guxnr2j.
56. McGuire P. Cyclical growth in the interbank market / P. McGuire, K. von Kleist. // BIS Quarterly Review. – 2008. – №3. – С. 24–25.
57. McCauley R. Emerging market debt securities issuance in offshore centres / R. McCauley, C. Upper, A. Villar. // BIS Quarterly Review. – 2013. – №12. – С. 22–23.
58. McCauley R. Non-US banks' claims on the Federal Reserve / R. McCauley, P. McGuire. // BIS Quarterly Review. – 2014. – №3. – С. 89–97.
59. McGuire P. The dollar shortage in global banking and the international policy response / P. McGuire, G. von Peter. // International Finance. – 2012. – №15/2. – С. 155–178.

60. McKinsey. East Africa: The next hub for apparel sourcing? [Електронний ресурс] / McKinsey // McKinsey and Company. – 2015. – Режим доступу до ресурсу: www.mckinsey.com/insights/consumer_and_retail /east_africa_the_next_hub_for_apparel_sourcing.
61. Nakajima J. Time-varying parameter VAR model with stochastic volatility: an overview of methodology and empirical applications / J.Nakajima // Monetary and Economic Studies. – 2011. – №29. – С. 107–142.
62. Neely C. The large-scale asset purchases had large international effects [Електронний ресурс] / Neely // Journal of Banking and Finance. – 2014. – Режим доступу до ресурсу: http://dx.doi.org/10.1016/j.jbankfin.2014.11.019.
63. Neely C. Unconventional Monetary Policy Had Large International Effects / Christopher Neely. // Journal of Banking and Finance. – 2015. – С. 101–111.
64. Obstfeld M. Trilemmas and tradeoffs: living with financial globalization / Obstfeld. – Berkeley: mimeo, University of California, 2013. – 68 с.
65. Primiceri G. E. Time varying structural vector autoregression and monetary policy / Primiceri. // Review of Economic Studies. – 2005. – №72. – С. 821–852.
66. Regional Economic Outlook: Sub-Saharan Africa 2015 [Електронний ресурс] // International Monetary Fund, Washington, DC. – 2016. – Режим доступу до ресурсу: www.imf.org/external/pubs/ft/reo/2015/afr/eng/pdf/sreo0415.pdf.
67. Rey H. Dilemma not trilemma: the global financial cycle and monetary policy independence / H. Rey. // Federal Reserve Bank of Kansas City Jackson Hole Economic Symposium Proceedings. – 2013. – №1. – С. 285–333.
68. Rogers J. Evaluating asset-market effects of unconventional monetary policy: a cross-country comparison / J. Rogers, C. Scotti, J. Wright. // Economic Policy. – 2014. – №29/80. – С. 749–799.
69. Shin H. Monetary aggregates and global liquidity: evidence from individual firm data from Asia / H. Shin, Y. Zhao. // Financial Regulatory Reform in Asia. – 2013. – №1. – С. 28–29.

70. Shin H. S. The second phase of global liquidity and its impact on emerging economies / H. Shin. // Federal Reserve Bank of San Francisco Asia Economic Policy Conference. – 2013. – №11. – С. 3–5.
71. Spanning Africa’s infrastructure gap: How development capital is transforming Africa’s project build-out [Електронний ресурс] // The Economist Corporate Network, London. – 2015. – Режим доступу до ресурсу: http://ftp01.economist.com.hk/ECN_papers/Infrastructure-Africa.
72. Stanley F. The Transmission of Exchange Rate Changes to Output and Inflation [Електронний ресурс] / Fischer Stanley // Board of Governors of the Federal Reserve System, Washington. – 2015. – Режим доступу до ресурсу: https://www.federalreserve.gov/newsevents/speech/fischer20151112a.htm.
73. Tang M. Credit developments in Hong Kong: how are they related to monetary conditions in Mainland China? / M. Tang, P. Ng. // HKMA Occasional Paper. – 2012. – №2.
74. The financial market effects of the Federal Reserve\'s large-scale asset purchases / J.Gagnon, M. Raskin, J. Remache, B. Sack. // International Journal of Central Banking. – 2011. – №7/1. – С. 3–43.
75. Turner P. Benign neglect of the long-term interest rate / P. Turner. // BIS Working Papers. – 2013. – №2. – С. 403.
76. Wheelen T. Strategic Management and Business Policy: Concept / T. Wheelen, D. Hunger // Pearson. – 2010.
77. World Bank. World development indicators. – Washington DC. – 2015. – available at: http://data.worldbank.org.

Table 1. **Basic indicators, 2015**

	Population (thousands)	Land area (thousands of km²)	Population density (pop. / km²)	GDP based on PPP valuation (USD million)	GDP per capita (PPP valuation, USD)	Annual real GDP growth (average over 2007-15)
Algeria	39 667	2 382	17	570 638	14 386	3.1
Angola	25 022	1 247	20	185 246	7 403	6.2
Benin	10 880	115	95	21 156	1 945	4.5
Botswana	2 262	582	4	37 160	16 424	4.7
Burkina Faso	18 106	274	66	31 184	1 722	5.9
Burundi	11 179	28	402	7 882	705	3.4
Cabo Verde	521	4	129	3 479	6 684	3.0
Cameroon	23 344	475	49	72 109	3 089	4.1
Central African Republic	4 900	623	8	3 052	623	-1.4
Chad	14 037	1 284	11	32 003	2 280	5.0
Comoros	788	2	424	1 214	1 539	1.7
Congo	4 620	342	14	28 919	6 259	4.4
Congo, Dem. Rep.	77 267	2 345	33	63 266	819	6.9
Côte d'Ivoire	22 702	322	70	78 335	3 451	4.6
Djibouti	888	23	38	3 093	3 484	5.2
Egypt*	91 508	1 001	91	995 969	10 884	4.1
Equatorial Guinea	845	28	30	25 944	30 701	6.8
Eritrea	5 228	118	44	7 939	1 519	1.9
Ethiopia*	99 391	1 104	90	159 224	1 602	10.5
Gabon	1 725	268	6	34 409	19 944	4.5
Gambia	1 991	11	176	3 269	1 642	3.7
Ghana	27 410	239	115	113 349	4 135	6.7
Guinea	12 609	246	51	15 276	1 212	2.2
Guinea-Bissau	1 844	36	51	2 676	1 451	3.3
Kenya	46 050	580	79	143 051	3 106	5.1
Lesotho	2 135	30	70	5 777	2 706	4.7
Liberia	4 503	111	40	3 781	840	6.3
Libya	6 278	1 760	4	92 875	14 793	0.2
Madagascar	24 235	587	41	35 556	1 467	2.6
Malawi	17 215	118	145	20 558	1 194	5.6
Mali	17 600	1 240	14	29 151	1 656	3.9
Mauritania	4 068	1 031	4	16 427	4 039	3.7
Mauritius	1 273	2	624	24 509	19 250	4.0
Morocco	34 378	447	77	274 526	7 986	4.1

Table 1. **Basic indicators, 2015** (cont.)

	Population (thousands)	Land area (thousands of km²)	Population density (pop. / km²)	GDP based on PPP valuation (USD million)	GDP per capita (PPP valuation, USD)	Annual real GDP growth (average over 2007-15)
Mozambique	27 978	799	35	33 726	1 205	7.0
Namibia	2 459	824	3	24 839	10 102	4.6
Niger	19 899	1 267	16	18 960	953	5.6
Nigeria	182 202	924	197	1 105 343	6 067	6.0
Rwanda	11 610	26	441	20 321	1 750	7.5
Sao Tome and Principe	190	1	198	664	3 488	4.8
Senegal	15 129	197	77	36 300	2 399	3.8
Seychelles	96	0.460	210	2 533	26 259	4.7
Sierra Leone	6 453	72	90	9 832	1 524	5.1
Somalia	10 787	638	17	…	…	…
South Africa	54 490	1 219	45	724 010	13 287	2.3
South Sudan	12 340	644	19	22 461	1 820	9.0
Sudan	40 235	1 879	21	167 421	4 161	4.0
Swaziland	1 287	17	74	10 869	8 446	1.9
Tanzania	53 470	947	56	138 304	2 587	6.7
Togo	7 305	57	129	10 816	1 481	4.1
Tunisia	11 254	164	69	127 213	11 304	2.7
Uganda	39 032	242	162	79 753	2 043	6.5
Zambia	16 212	753	22	64 647	3 988	7.0
Zimbabwe	15 603	391	40	27 916	1 789	3.1
AFRICA	**1 184 501**	**30 066**	**39**	**5 768 932**	**4870**	**4.6**

Table 2. **Real GDP growth rates, 2007-17**

	2007	2008	2009	2010	2011	2012	2013	2014	2015 (e)	2016 (p)	2017 (p)
Algeria	3.4	2.4	1.6	3.6	2.8	3.3	2.8	3.8	3.9	3.4	3.0
Angola	14.0	11.2	2.4	3.4	3.9	5.2	6.8	4.8	3.8	3.3	3.5
Benin	4.6	5.0	2.7	2.6	3.3	5.4	5.6	6.5	5.2	5.5	5.7
Botswana	8.3	6.2	-7.7	8.6	6.0	4.8	9.3	4.4	2.5	3.2	3.5
Burkina Faso	4.1	5.8	2.9	8.4	6.6	9.0	6.6	5.0	4.8	5.0	5.9
Burundi	3.5	4.9	3.8	5.1	4.0	4.4	4.5	4.7	-4.1	3.3	4.4
Cabo Verde	8.6	6.7	-1.3	1.5	4.0	1.1	0.8	1.8	3.6	4.0	4.0
Cameroon	3.3	2.9	1.9	3.3	4.1	4.6	5.6	5.9	5.7	5.3	5.1
Central African Republic	4.6	2.1	1.7	3.0	3.3	4.1	-36.1	1.0	4.1	5.2	6.0
Chad	3.1	2.5	2.8	13.6	0.1	8.9	3.9	6.3	4.1	2.6	4.9
Comoros	0.8	0.6	1.1	2.2	2.5	3.0	3.5	0.6	1.1	4.1	4.1
Congo	-1.6	5.9	7.5	8.7	3.4	3.8	4.9	6.0	1.2	4.2	4.7
Congo, Dem. Rep.	6.3	6.2	2.8	7.2	6.9	7.2	8.5	9.2	7.7	7.0	8.0
Côte d'Ivoire	1.6	2.3	3.8	2.4	-4.7	10.7	8.7	7.9	8.8	8.6	8.3
Djibouti	5.1	5.8	5.0	3.5	4.5	4.8	5.0	6.0	6.7	7.4	7.1
Egypt*	7.1	7.2	4.9	4.8	1.8	2.2	2.1	2.2	4.2	4.3	4.5
Equatorial Guinea	24.8	20.8	19.0	-0.8	7.7	9.5	-12.1	2.3	-10.2	-8.0	-3.4
Eritrea	1.4	-9.8	3.9	2.2	8.7	7.0	1.3	1.7	0.3	2.2	3.4
Ethiopia*	11.5	10.8	8.8	12.4	11.2	8.6	10.6	10.3	10.2	8.1	7.7
Gabon	4.8	5.3	-2.7	6.9	7.0	5.3	5.6	4.4	4.2	4.5	5.1
Gambia	3.6	5.7	6.4	6.5	-4.3	5.3	4.3	0.9	4.7	5.5	5.6
Ghana	6.5	8.4	4.0	3.4	14.0	9.3	7.3	4.0	3.7	5.8	8.7
Guinea	1.8	4.9	-0.3	1.9	3.9	3.9	2.3	1.1	0.1	4.0	4.8
Guinea-Bissau	3.2	3.2	3.3	4.4	9.4	-1.8	0.8	2.7	4.8	5.7	6.2
Kenya	6.9	0.2	3.3	8.4	6.1	4.6	5.7	5.3	5.5	6.0	6.4
Lesotho	4.7	5.7	3.4	7.9	4.0	5.0	4.5	3.6	3.4	2.6	2.9
Liberia	13.0	6.2	5.4	6.3	7.9	8.3	8.7	0.7	0.4	2.8	4.4
Libya	6.4	2.7	-0.8	4.3	-61.4	92.1	-12.3	-23.5	-6.0	-0.8	3.9
Madagascar	6.5	7.2	-3.5	0.1	1.5	2.5	2.4	3.3	3.2	4.0	4.5
Malawi	5.5	8.6	7.6	9.5	3.8	1.9	5.2	5.7	2.9	4.0	4.9
Mali	4.3	5.0	4.5	5.8	2.7	0.0	1.7	5.8	5.2	5.2	5.0
Mauritania	2.8	1.1	-1.0	4.8	4.4	6.0	5.5	6.6	3.1	3.5	4.5
Mauritius	5.4	5.5	3.1	4.2	3.9	3.2	3.2	3.6	3.7	3.8	3.7
Morocco	3.5	5.9	4.2	3.8	5.2	3.0	4.7	2.4	4.5	1.8	3.5

Appendix A

Table 2. **Real GDP growth rates, 2007-17** (cont.)

	2007	2008	2009	2010	2011	2012	2013	2014	2015 (e)	2016 (p)	2017 (p)
Mozambique	7.3	6.8	6.5	7.1	7.4	7.1	7.4	7.2	6.3	6.5	7.5
Namibia	5.4	2.6	0.3	6.0	5.1	5.1	5.7	6.4	4.4	4.2	6.0
Niger	3.1	9.6	-0.7	8.4	2.3	11.8	5.3	7.0	3.6	5.0	5.5
Nigeria	6.4	6.0	7.0	10.6	4.9	4.3	5.4	6.2	3.0	3.8	5.0
Rwanda	7.6	11.2	6.3	7.3	7.9	8.8	4.7	7.0	7.1	6.8	7.2
Sao Tome and Principe	2.0	9.1	4.0	4.5	4.9	4.6	4.2	4.5	5.3	5.0	5.4
Senegal	5.0	3.7	2.4	4.2	1.8	4.4	3.5	4.3	5.1	6.0	6.5
Seychelles	10.4	-2.1	-1.1	5.9	7.9	6.0	6.6	3.7	4.6	3.1	3.7
Sierra Leone	8.0	5.2	3.2	5.3	6.0	15.2	20.1	4.6	-21.5	0.2	3.7
Somalia	...	...	...	...	...	...	...	...	...	...	...
South Africa	5.4	3.2	-1.5	3.0	3.2	2.2	2.2	1.5	1.3	0.7	1.8
South Sudan	...	...	...	...	...	...	29.3	15.9	-5.3	0.7	8.8
Sudan	5.8	3.8	4.5	6.5	0.9	1.4	4.4	3.6	5.3	6.2	6.0
Swaziland	3.5	2.4	1.3	1.9	-0.6	1.9	3.0	2.5	1.7	0.8	1.7
Tanzania	8.5	5.6	5.4	6.4	7.9	5.1	7.3	7.0	7.0	7.2	7.2
Togo	2.1	2.4	3.4	4.0	4.8	4.8	4.0	5.9	5.5	5.9	6.0
Tunisia	6.3	4.5	3.1	3.0	-1.9	3.9	2.4	2.3	0.5	2.0	2.4
Uganda	8.1	10.4	8.1	7.7	6.8	2.6	4.4	4.7	5.3	5.1	5.8
Zambia	8.4	7.8	9.2	10.3	6.4	6.8	6.7	5.0	3.7	3.6	4.9
Zimbabwe	-3.7	-17.7	5.3	11.4	11.9	10.6	4.5	3.8	1.5	1.6	3.1
AFRICA	**6.1**	**5.3**	**3.5**	**5.8**	**2.9**	**6.4**	**3.9**	**3.7**	**3.6**	**3.7**	**4.5**

Table 3. **Demand composition and growth rate, 2014-17**

	2014						2015 (e)				2016 (p)				2017 (p)			
	Final consumption		Gross capital formation		External sector		Total final con-sumption	Gross capital formation total	Exports	Imports	Total final con-sumption	Gross capital formation total	Exports	Imports	Total final consump-tion	Gross capital formation total	Exports	Imports
	Private	Public	Private	Public	Exports	Imports												
	% of GDP						Real percentage growth				Real percentage growth				Real percentage growth			
Algeria	36.4	19.4	16.9	28.7	30.5	32.0	9.2	0.6	-1.5	3.6	0.2	6.8	3.0	2.1	1.9	6.6	-0.6	3.3
Angola	34.9	30.2	5.3	23.7	40.7	34.7	-9.0	-29.1	23.6	-22.7	0.0	12.5	0.8	1.0	5.8	9.3	-4.0	0.9
Benin	68.0	15.9	19.6	5.4	36.1	45.1	3.6	8.1	1.6	1.3	6.3	14.1	3.7	10.7	6.7	5.7	5.3	6.9
Botswana	46.0	16.4	22.3	8.3	62.2	55.2	-5.5	4.6	3.8	-4.2	5.5	17.0	-1.1	9.9	3.3	-7.2	5.3	-2.8
Burkina Faso	86.1	12.2	4.5	6.3	21.9	30.9	2.9	10.2	3.7	0.5	3.7	11.4	5.0	3.8	4.8	13.2	3.1	4.0
Burundi	79.1	15.1	16.6	16.5	10.4	37.6	-11.9	-5.9	5.8	-18.5	9.7	-14.1	1.2	-0.3	5.9	4.7	1.3	7.0
Cabo Verde	59.0	26.9	26.9	6.6	52.3	71.7	-7.5	8.0	6.9	-4.6	0.5	-1.3	7.0	-0.5	2.2	-6.3	7.2	-0.9
Cameroon	76.9	11.8	18.2	2.5	21.7	31.2	4.4	7.8	7.5	4.8	4.2	10.6	5.3	5.8	4.7	10.1	2.6	6.0
Central African Republic	106.5	8.1	8.1	2.1	12.3	37.1	2.2	4.2	10.9	1.5	0.4	11.1	23.3	0.8	2.1	29.1	9.6	4.9
Chad	74.4	7.7	20.9	9.6	31.5	44.1	0.6	1.7	9.1	-0.5	2.5	1.7	2.6	1.7	-0.7	3.8	14.8	0.7
Comoros	100.5	14.4	10.6	8.0	17.0	50.5	-3.3	3.5	5.5	-6.0	4.7	2.7	3.7	4.7	7.2	-7.4	3.5	6.0
Congo	29.7	16.4	42.1	21.4	69.9	79.4	5.2	-15.8	9.9	-6.0	3.5	-12.7	10.3	-6.2	4.1	-2.5	1.0	-5.1
Congo, Dem. Rep.	80.7	11.5	9.3	6.4	33.8	41.8	2.7	10.6	12.0	5.3	7.6	1.3	9.2	8.4	18.2	11.9	7.4	26.0
Côte d'Ivoire	71.7	8.7	10.8	6.0	42.3	39.4	7.3	22.6	6.6	9.0	5.7	9.5	9.5	4.5	11.7	15.2	-0.7	8.1
Djibouti	65.5	22.6	14.1	30.0	32.1	64.3	7.6	10.5	0.8	7.2	7.6	10.7	2.0	7.1	9.1	7.1	1.8	6.9
Egypt*	82.7	12.0	8.1	5.7	14.4	23.0	3.4	11.9	0.3	4.6	3.7	8.6	2.6	4.8	3.9	8.6	2.8	5.0
Equatorial Guinea	16.8	6.9	21.2	26.7	95.6	67.1	20.4	24.8	-4.5	5.0	9.8	-6.8	5.3	1.4	13.0	1.3	0.0	2.8
Eritrea	78.3	19.3	2.0	6.0	18.9	24.5	12.6	7.0	-6.8	29.4	6.3	5.4	0.0	11.8	-0.6	5.5	5.3	-1.7
Ethiopia*	70.2	9.2	10.7	27.3	11.6	29.1	5.3	31.4	-2.0	23.0	14.4	4.7	1.9	13.4	11.6	4.7	3.2	10.0
Gabon	32.4	16.4	20.0	6.7	56.7	32.4	5.9	2.5	1.3	1.4	3.5	-3.3	6.4	-0.3	3.6	2.5	5.3	1.1
Gambia	84.8	10.2	13.2	11.3	29.6	49.1	7.1	3.9	-4.4	4.1	6.2	11.0	1.0	7.9	1.1	22.1	5.8	4.2
Ghana	64.3	18.0	22.2	5.0	39.5	48.9	-0.6	9.0	2.0	-4.3	5.3	-5.4	18.0	4.5	19.1	1.8	1.1	23.6
Guinea	89.4	11.5	12.6	5.7	25.7	44.8	-3.1	12.1	-3.8	-1.0	5.8	-7.5	0.4	-1.7	1.4	8.7	3.8	0.1
Guinea-Bissau	91.5	11.9	3.3	4.7	20.6	32.0	3.9	10.5	15.1	9.8	9.5	9.1	-10.9	6.1	2.3	8.1	14.5	0.1
Kenya	82.1	14.0	15.6	5.7	16.4	33.9	8.4	0.7	1.2	7.5	4.9	8.1	0.7	2.1	11.3	-13.5	0.9	4.6
Lesotho	92.2	35.0	19.6	14.4	40.0	101.2	-1.8	9.2	1.5	-2.7	-4.6	4.5	6.0	-6.9	-0.7	7.3	1.5	-0.9
Liberia	73.0	23.4	15.1	7.6	29.9	49.0	28.4	77.8	-36.6	38.9	-25.5	34.0	41.3	-0.1	-12.0	2.0	10.3	-9.4
Libya	44.7	52.1	23.6	7.9	33.5	61.9	2.4	-1.4	-18.3	1.6	1.9	-19.3	2.0	-5.6	3.4	-5.9	8.6	0.7
Madagascar	78.5	10.2	11.6	3.9	32.8	37.1	0.4	8.2	1.0	-2.7	3.0	10.1	3.0	3.8	5.8	13.4	-0.2	7.6
Malawi	78.7	12.5	10.1	4.0	34.0	39.3	-1.0	14.8	3.8	-4.2	2.4	1.9	1.7	-4.5	5.3	7.5	-0.3	3.2

Table 3. **Demand composition and growth rate, 2014-17** (cont.)

	2014						2015 (e)				2016 (p)				2017 (p)			
	Final consumption		Gross capital formation		External sector		Total final con-sumption	Gross capital formation total	Exports	Imports	Total final con-sumption	Gross capital formation total	Exports	Imports	Total final consump-tion	Gross capital formation total	Exports	Imports
	Private	Public	Private	Public	Exports	Imports												
	% of GDP						Real percentage growth				Real percentage growth				Real percentage growth			
Mali	63.8	17.3	14.4	11.9	24.3	31.8	6.6	3.2	1.5	4.5	8.6	4.0	-3.1	7.6	2.8	4.8	4.0	-1.2
Mauritania	61.2	21.9	37.1	9.3	43.0	72.4	1.8	7.4	2.3	3.6	3.9	9.1	2.1	6.4	3.2	7.6	4.9	5.2
Mauritius	73.9	14.5	18.2	4.9	51.5	63.0	6.8	6.4	3.1	7.7	-2.0	6.4	7.1	0.7	0.2	4.0	4.1	0.3
Morocco	60.3	19.9	28.3	3.9	34.3	46.6	5.2	7.0	2.5	5.9	1.3	4.1	1.8	2.6	4.0	6.0	2.5	5.2
Mozambique	73.4	25.6	31.9	14.3	30.7	75.9	5.3	13.6	-4.9	3.6	1.8	-2.3	-3.0	-8.3	-3.1	3.7	5.7	-9.0
Namibia	64.5	27.5	29.8	4.4	39.9	66.1	-1.8	2.4	8.4	-3.6	4.4	-8.6	4.0	-3.5	-5.1	13.5	12.6	-3.1
Niger	65.5	15.0	26.7	11.1	21.0	39.2	4.5	14.2	-15.4	5.5	2.4	13.0	2.0	6.4	4.6	-1.3	16.8	1.0
Nigeria	70.9	7.4	10.3	5.5	18.4	12.5	-7.0	5.8	33.3	-0.9	-6.0	-1.4	28.2	-2.9	9.2	10.4	-6.7	3.1
Rwanda	75.0	15.5	13.0	13.0	14.8	31.3	7.7	7.6	4.1	7.9	6.9	7.0	3.0	5.4	6.7	10.5	2.7	7.0
Sao Tome and Principe	92.2	13.1	15.5	15.7	9.7	46.2	-0.2	7.4	7.1	-1.2	4.3	4.5	1.6	2.9	4.2	3.7	0.2	1.1
Senegal	77.7	16.6	18.1	6.8	28.1	47.2	8.8	7.1	2.7	12.6	4.0	2.5	6.1	0.1	2.3	4.1	8.4	-2.6
Seychelles	54.6	26.3	30.0	6.6	78.6	96.1	20.7	52.8	0.4	38.0	7.1	28.3	5.2	19.8	0.8	16.7	9.8	11.0
Sierra Leone	100.5	10.2	7.9	5.4	39.8	63.8	-30.7	6.7	-12.8	-21.4	-1.6	17.2	-2.3	2.0	7.6	11.8	0.1	8.7
Somalia	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
South Africa	60.6	20.9	13.3	7.1	31.3	33.1	0.4	3.1	1.8	0.5	-1.3	3.7	1.1	-2.5	1.5	4.0	-0.9	-0.2
South Sudan	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…	…
Sudan	80.2	9.6	11.8	3.6	6.4	11.6	3.9	13.5	0.6	6.9	6.0	11.0	1.5	10.6	4.7	10.9	2.6	5.1
Swaziland	77.1	19.0	4.0	5.2	49.8	55.2	2.9	10.7	-0.7	3.8	-1.1	7.3	-0.2	-2.5	0.0	8.8	1.1	-0.5
Tanzania	65.6	13.8	26.2	4.8	19.5	29.9	8.8	10.5	5.3	13.3	8.0	10.7	2.5	9.8	8.1	9.3	4.3	9.7
Togo	81.1	14.2	13.8	9.4	39.7	58.1	7.0	5.6	-0.2	4.4	7.0	5.7	4.9	7.0	5.1	4.3	5.7	3.6
Tunisia	69.1	18.7	14.4	8.8	45.0	55.9	-0.5	1.0	-1.5	-2.7	1.1	0.5	2.3	-0.1	1.8	1.6	3.3	1.7
Uganda	76.4	9.1	21.3	4.8	16.9	28.4	6.6	3.2	6.8	7.6	5.9	4.2	4.0	5.8	6.2	4.5	3.5	4.4
Zambia	52.7	9.0	31.7	3.1	41.8	38.3	18.9	6.9	-15.3	7.4	-1.9	8.2	1.9	-3.0	1.8	6.0	3.1	-0.9
Zimbabwe	88.1	24.1	10.5	2.7	27.1	52.5	10.9	2.4	5.1	20.8	0.2	8.3	2.3	0.9	1.3	6.1	6.3	1.8

Table 4. **Public finances, 2014-17 (percentage of GDP)**

	2014			2015 (e)			2016 (p)			2017 (p)		
	Total revenue and grants	Total expenditure and net lending	Overall balance	Total revenue and grants	Total expenditure and net lending	Overall balance	Total revenue and grants	Total expenditure and net lending	Overall balance	Total revenue and grants	Total expenditure and net lending	Overall balance
Algeria	33.4	41.7	-8.3	26.9	42.9	-16.0	25.7	41.2	-15.4	26.3	41.0	-14.7
Angola	30.1	35.7	-5.6	25.9	30.0	-4.1	25.0	30.5	-5.5	24.7	30.4	-5.6
Benin	17.4	19.4	-1.9	17.7	22.0	-4.3	18.4	22.0	-3.6	18.3	22.0	-3.7
Botswana**	37.8	32.2	5.6	38.4	34.8	3.6	36.0	38.8	-2.8	36.2	38.5	-2.3
Burkina Faso	21.4	23.2	-1.8	22.1	24.6	-2.5	21.8	24.9	-3.1	21.7	25.4	-3.7
Burundi	28.9	30.1	-1.2	28.3	34.0	-5.7	31.7	33.9	-2.2	29.0	31.1	-2.1
Cabo Verde	25.0	32.4	-7.4	26.5	31.0	-4.5	25.9	29.9	-4.0	25.7	29.5	-3.8
Cameroon	18.2	22.1	-3.9	17.6	22.9	-5.3	17.1	22.8	-5.7	17.3	22.2	-4.9
Central African Rep.	15.6	12.4	3.2	11.0	14.2	-3.2	12.3	15.1	-2.8	10.8	13.1	-2.3
Chad	17.5	22.2	-4.7	16.5	22.9	-6.4	15.7	22.6	-7.0	15.6	23.0	-7.4
Comoros	23.9	24.5	-0.7	23.4	24.6	-1.2	22.6	24.8	-2.2	22.7	24.4	-1.7
Congo	41.2	46.0	-4.8	41.6	51.2	-9.6	42.3	44.1	-1.8	40.4	39.1	1.3
Congo, Dem. Rep.	13.7	13.3	0.5	14.8	15.3	-0.5	14.7	15.4	-0.7	15.2	14.2	1.0
Côte d'Ivoire	19.8	22.0	-2.3	20.8	24.3	-3.5	20.6	24.0	-3.4	20.9	24.7	-3.8
Djibouti	35.6	46.0	-10.5	37.0	43.8	-6.7	36.4	42.2	-5.8	35.4	41.2	-5.8
Egypt*	21.7	33.9	-12.2	21.3	32.8	-11.5	22.9	32.5	-9.6	22.5	31.1	-8.7
Equatorial Guinea	33.6	40.4	-6.8	29.7	36.6	-6.9	30.1	37.4	-7.3	29.3	38.3	-9.0
Eritrea*	14.7	29.3	-14.6	18.6	29.4	-10.7	18.7	28.9	-10.3	18.7	28.6	-9.9
Ethiopia*	15.1	17.7	-2.6	16.1	18.1	-2.0	14.5	15.7	-1.3	14.2	15.0	-0.8
Gabon	26.1	23.5	2.7	24.8	27.5	-2.7	24.2	28.8	-4.6	24.3	26.5	-2.3
Gambia	21.9	32.9	-11.0	23.1	32.7	-9.6	23.5	32.8	-9.3	23.3	29.3	-6.1
Ghana	21.8	28.2	-6.4	23.1	28.7	-5.7	23.4	28.4	-5.0	22.7	26.5	-3.9
Guinea	19.4	23.5	-4.1	18.1	25.6	-7.5	18.4	23.4	-5.0	18.0	22.7	-4.6
Guinea-Bissau	23.1	25.2	-2.1	22.9	25.1	-2.2	21.2	23.9	-2.7	20.9	24.0	-3.1
Kenya*	20.0	25.7	-5.7	22.5	31.3	-8.8	22.0	30.1	-8.2	20.7	27.0	-6.3
Lesotho**	60.4	62.9	-2.5	60.6	60.0	0.6	60.5	63.5	-3.1	62.0	67.5	-5.5
Liberia*	27.3	30.2	-2.9	27.0	37.0	-9.9	27.2	32.8	-5.6	25.0	30.8	-5.7
Libya	40.9	84.4	-43.5	41.8	100.7	-58.9	41.4	102.1	-60.7	40.7	97.5	-56.8
Madagascar	12.4	14.7	-2.3	12.3	16.9	-4.6	12.8	15.9	-3.1	13.4	17.0	-3.6
Malawi*	22.3	28.2	-5.9	21.2	26.9	-5.7	22.3	25.6	-3.3	22.4	25.4	-3.1
Mali	20.8	24.4	-3.5	20.8	24.5	-3.7	20.8	24.3	-3.5	21.0	24.7	-3.6
Mauritania	27.8	31.5	-3.7	28.8	31.7	-2.9	27.1	29.5	-2.4	26.2	28.3	-2.2

Table 4. **Public finances, 2014-17 (percentage of GDP)** (cont.)

	2014			2015 (e)			2016 (p)			2017 (p)		
	Total revenue and grants	Total expenditure and net lending	Overall balance	Total revenue and grants	Total expenditure and net lending	Overall balance	Total revenue and grants	Total expenditure and net lending	Overall balance	Total revenue and grants	Total expenditure and net lending	Overall balance
Mauritius	20.6	23.9	-3.2	21.4	25.7	-4.4	22.4	26.3	-3.9	22.5	26.3	-3.8
Morocco	28.0	33.0	-4.9	27.4	31.7	-4.3	27.3	30.8	-3.5	26.8	29.8	-3.0
Mozambique	33.3	40.0	-6.6	32.9	38.4	-5.4	33.5	37.3	-3.7	33.7	36.1	-2.4
Namibia**	32.8	37.1	-4.3	36.0	39.8	-3.8	37.3	40.5	-3.1	37.5	41.2	-3.7
Niger	22.9	28.4	-5.5	25.0	32.2	-7.1	24.3	31.1	-6.7	23.4	27.8	-4.4
Nigeria	14.6	13.7	1.0	13.2	15.6	-2.3	12.4	15.8	-3.4	12.4	15.6	-3.1
Rwanda*	26.0	30.0	-4.0	25.4	30.4	-5.0	24.5	29.4	-4.9	23.9	29.5	-5.6
Sao Tome and Principe	26.0	31.5	-5.5	24.3	30.4	-6.1	24.1	28.0	-3.9	24.5	28.5	-4.0
Senegal	25.5	30.6	-5.2	26.0	30.6	-4.6	26.4	30.5	-4.1	26.6	29.8	-3.2
Seychelles	34.9	32.7	2.2	34.4	32.5	1.9	34.0	32.5	1.4	32.8	31.8	1.0
Sierra Leone	14.2	17.3	-3.0	19.3	23.0	-3.7	17.7	23.7	-6.0	16.4	22.4	-6.0
Somalia	…	…	…	...	…	...	…	…	…	…	…	…
South Africa**	26.1	29.7	-3.6	28.4	32.3	-3.9	30.0	33.2	-3.3	30.7	33.8	-3.1
South Sudan*	…	…	-10.9	…	…	-21.3	…	…	-22.0	…	…	-18.1
Sudan	10.4	11.4	-1.0	10.0	11.5	-1.5	9.3	10.7	-1.4	9.1	10.2	-1.0
Swaziland**	27.0	26.3	0.7	34.1	35.5	-1.4	31.4	33.2	-1.8	32.0	34.1	-2.1
Tanzania*	15.7	19.1	-3.4	14.6	18.5	-3.9	14.4	18.8	-4.4	14.8	20.2	-5.4
Togo	24.9	28.3	-3.4	24.9	30.2	-5.3	25.1	29.9	-4.7	25.5	29.9	-4.4
Tunisia	25.2	29.6	-4.4	24.5	28.7	-4.2	24.3	28.2	-3.9	24.4	28.1	-3.7
Uganda*	13.0	17.1	-4.1	14.1	18.6	-4.5	13.9	19.9	-6.0	13.7	19.2	-5.5
Zambia	18.9	24.8	-5.9	18.5	26.7	-8.2	19.3	25.9	-6.6	20.1	26.3	-6.2
Zimbabwe	26.5	28.4	-1.9	26.7	28.3	-1.6	26.9	28.4	-1.5	27.1	28.3	-1.2
AFRICA	**25.3**	**30.1**	**-4.8**	**22.8**	**29.4**	**-6.6**	**23.0**	**30.5**	**-6.5**	**23.7**	**29.8**	**-5.9**

Table 5. **Monetary indicators, 2014-17**

	Inflation (%)				Exchange rate (LCU / USD)			Broad money (LCU billion) 2015			Reserves, excluding gold, (USD million) 2015	
	2014	2015 (e)	2016 (p)	2017 (p)	2013	2014	2015	Level	% of GDP	Growth 2014-15	Stock at year-end	Eq. months of imports
Algeria	2.9	4.8	4.3	4.0	79.4	80.6	100.7	13 457.2	77.1	-1.6	144 677.5	29.1
Angola	7.3	10.2	14.1	14.8	96.5	98.3	120.1	5 712.9	44.0	11.5	23 901.2	8.1
Benin	-1.1	0.4	2.3	2.4	494.0	494.4	591.4	2 754.9	51.5	17.1	731.6	2.2
Botswana	4.4	3.1	4.5	4.3	8.4	9.0	10.1	67.9	49.4	7.7	7 958.9	13.4
Burkina Faso	-0.3	0.8	2.0	1.9	494.0	494.4	591.4	2 477.2	36.9	14.5	259.6	0.9
Burundi	4.4	5.5	7.5	6.7	1 555.1	1 546.7	1 570.6	906.5	22.3	0.0	135.1	2.1
Cabo Verde	-0.2	0.0	1.6	2.7	83.1	83.1	99.4	154.6	90.7	4.7	428.4	4.6
Cameroon	1.9	2.7	2.2	2.1	494.0	494.4	591.4	4 091.6	23.9	8.6	3 353.2	4.7
Central African Republic	11.6	5.6	4.7	4.0	494.0	494.4	591.4	275.4	28.9	12.5	221.8	4.8
Chad	1.7	4.0	2.7	4.0	494.0	494.4	591.4	1 115.9	15.9	3.5	207.3	0.5
Comoros	2.9	2.1	2.2	2.6	370.5	370.8	443.6	100.0	40.9	2.9	136.6	6.0
Congo	3.0	0.9	1.5	1.0	494.0	494.4	591.4	2 659.7	50.1	1.4	2 259.9	2.8
Congo, Dem. Rep.	1.0	0.8	2.1	2.5	919.8	925.2	926.0	4 217.0	13.9	6.7	1 215.9	1.2
Côte d'Ivoire	0.4	1.5	1.8	1.9	494.0	494.4	591.4	3 070.8	16.3	17.4	4 715.7	5.0
Djibouti	3.0	3.1	3.3	3.4	177.7	177.7	177.7	257.5	81.4	9.7	364.9	4.4
Egypt*	10.8	11.2	8.8	10.2	6.9	7.1	7.7	1 765.4	73.6	16.4	13 282.0	2.5
Equatorial Guinea	4.3	3.6	2.6	2.3	494.0	494.4	591.4	1 320.1	14.4	-15.2	1457.2	1.9
Eritrea	12.3	12.5	12.0	11.7	15.4	15.4	15.4	82.7	128.1	12.9	…	…
Ethiopia*	8.1	7.7	7.4	8.9	18.6	19.7	20.7	369.7	28.3	24.2	…	…
Gabon	3.2	1.2	2.4	2.4	494.0	494.4	591.4	2 077.0	25.3	-5.2	2 083.6	5.0
Gambia	6.3	6.5	5.5	5.5	36.0	41.7	47.2	22.6	56.5	11.0	143.3	4.6
Ghana	17.0	17.2	10.2	7.9	2.0	2.6	3.8	45.1	43.4	22.5	…	…
Guinea	9.7	8.0	8.5	8.8	6 995.9	7014.1	7 425.7	1 6974.0	31.2	15.7	233.5	1.0
Guinea-Bissau	1.9	1.5	2.1	1.8	494.0	494.4	591.4	272.4	43.1	11.3	332.1	11.5
Kenya	6.9	6.0	6.0	5.2	86.1	87.9	98.1	2 694.7	41.9	15.6	7 762.4	4.6
Lesotho	5.3	3.8	3.9	4.0	9.7	10.9	12.8	9.3	39.6	3.1	904.2	5.8
Liberia	9.9	7.7	7.0	7.5	1.0	1.0	1.0	0.7	25.4	0.4	…	…
Libya	2.4	8.6	9.7	5.8	1.3	1.3	1.4	81.0	173.2	3.5	74 863.0	38.3
Madagascar	6.0	7.9	7.4	7.8	2 206.9	2 414.8	2 934.4	6 662.0	23.3	1.7	832.0	2.9
Malawi	23.8	21.2	18.1	16.0	364.4	424.9	499.5	804.6	27.3	27.8	640.2	3.8
Mali	0.9	2.0	2.7	1.8	494.0	494.4	591.4	2 238.5	35.9	13.2	624.0	2.5

Table 5. **Monetary indicators, 2014-17** (cont.)

	Inflation (%)				Exchange rate (LCU / USD)			Broad money (LCU billion) 2015			Reserves, excluding gold, (USD million) 2015	
	2014	2015 (e)	2016 (p)	2017 (p)	2013	2014	2015	Level	% of GDP	Growth 2014-15	Stock at year-end	Eq. months of imports
Mauritania	3.5	1.5	6.7	6.1	302.1	303.3	318.6	530.4	26.5	4.0	…	…
Mauritius	3.2	1.3	2.8	2.5	30.7	30.6	35.1	418.4	91.6	5.2	3 957.0	5.7
Morocco	0.4	1.8	1.4	1.6	8.4	8.4	9.8	1 149.2	106.6	5.8	22 253.9	5.8
Mozambique	2.3	2.0	5.7	5.2	30.1	31.4	40.1	239.8	0.0	17.1	2 411.4	0.0
Namibia	5.3	3.5	3.9	5.5	9.7	10.9	12.8	81.8	59.1	9.8	1 208.7	2.1
Niger	-0.9	1.0	1.3	0.9	494.0	494.4	591.4	1 113.9	26.9	0.3	1 039.0	4.1
Nigeria	7.8	9.0	10.1	9.4	157.3	158.6	192.4	20 612.6	23.0	9.6	31 561.8	6.2
Rwanda	2.4	2.5	3.0	3.0	646.6	681.9	729.0	1 416.7	24.7	15.8	1 029.8	5.4
Sao Tome and Principe	6.7	5.3	4.6	4.7	18 450.0	18 466.4	2 2090.6	2 877.3	40.6	15.1	78.4	7.3
Senegal	-0.5	0.0	-0.4	1.2	494.0	494.4	591.4	3 752.3	48.0	7.7	2 011.8	3.9
Seychelles	1.4	4.4	2.6	2.7	12.1	12.7	13.3	11.6	51.8	5.7	541.5	5.0
Sierra Leone	7.1	9.9	10.0	10.1	4 332.5	4 524.2	4 905.3	5 446.7	26.4	10.5	556.5	2.6
Somalia	...	...	...	...	...	...	...	…		…	…	…
South Africa	6.1	4.6	6.8	7.0	9.7	10.9	12.8	2 866.2	72.8	6.3	41 619.5	5.0
South Sudan	1.7	41.1	14.7	25.0	3.0	3.0	3.0	9.1	21.8	16.6	229.9	0.8
Sudan	36.9	16.9	13.1	11.2	4.8	5.7	6.0	91.7	15.0	18.0	181.5	0.2
Swaziland	5.7	5.6	6.0	6.7	9.7	10.9	12.8	12.5	27.8	7.4	553.6	3.1
Tanzania	6.1	5.6	5.9	6.0	1 600.4	1 654.0	1 979.7	21 626.3	23.1	16.2	4 071.9	4.1
Togo	0.2	1.9	2.1	2.2	494.0	494.4	591.4	1 212.3	51.3	10.5	574.0	3.1
Tunisia	5.5	5.0	4.0	3.5	1.6	1.7	2.0	62.9	77.6	6.9	7 205.5	4.3
Uganda	4.3	4.5	5.2	5.3	2 586.9	2 599.8	3 241.4	17 323.9	22.5	13.3	2 829.8	4.6
Zambia	7.8	10.1	10.8	8.9	5.4	6.2	8.6	39.7	18.7	13.4	2 967.6	3.5
Zimbabwe	-0.2	-2.0	-1.3	-0.7	…	…	…	4.6	36.7	5.1	328.0	0.6
AFRICA	**7.2**	**7.3**	**7.2**	**7.2**	…	…	…	…	…	…	…	…